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Economic and monetary developments

Overview

At its monetary policy meeting on 14 June 2018, the Governing Council concluded that progress towards a sustained adjustment in inflation had been substantial so far. Since the start of its asset purchase programme (APP) in January 2015, the Governing Council has made net asset purchases under the APP conditional on the extent of progress towards a sustained adjustment in the path of inflation to levels below, but close to, 2% in the medium term. On 14 June 2018, the Governing Council undertook a careful review of the progress made, also taking into account the latest Eurosystem staff macroeconomic projections, measures of price and wage pressures, and uncertainties surrounding the inflation outlook. As a result of this assessment, the Governing Council concluded that progress towards a sustained adjustment in inflation has been substantial so far. With longer-term inflation expectations well anchored, the underlying strength of the euro area economy and the continuing ample degree of monetary accommodation provide grounds to be confident that the sustained convergence of inflation towards the Governing Council's aim will continue in the period ahead, and will be maintained even after a gradual winding-down of its net asset purchases. The monetary policy decisions of 14 June 2018 maintain the current ample degree of monetary accommodation that will ensure the continued sustained convergence of inflation towards levels that are below, but close to, 2% over the medium term. Significant monetary policy stimulus is still needed to support the further build-up of domestic price pressures and headline inflation developments over the medium term. This support will continue to be provided by the net asset purchases until the end of the year, by the sizeable stock of acquired assets and the associated reinvestments, and by the Governing Council's enhanced forward guidance on the key ECB interest rates. In any event, the Governing Council stands ready to adjust all of its instruments as appropriate to ensure that inflation continues to move towards the Governing Council's inflation aim in a sustained manner.

Economic and monetary assessment at the time of the Governing Council meeting of 14 June 2018

Despite a slight softening of momentum, the near-term global outlook remains essentially solid, supported by accommodative monetary policies in advanced economies and significant fiscal stimulus in the United States. Further ahead, global activity is expected to slow as output is close to potential in many advanced economies. Global trade growth is seen as remaining resilient in the near term. However, the implementation of higher trade tariffs and the possibility of wider protectionist measures represent a key risk to global growth momentum. Global inflationary pressures are expected to rise slowly as spare capacity diminishes.

Since the Governing Council's meeting in March 2018, euro area long-term risk-free rates have decreased. Sovereign bond spreads have exhibited considerable volatility since the second half of May, against a background of political uncertainty in Italy. The fluctuations in government bond markets have spilled over into other market segments to some extent and stock market volatility has increased. Equity and bond prices of euro area financial corporations have declined, while the impact on other market segments has remained limited. At the same time, stock prices of euro area non-financial corporations have risen, reflecting a robust corporate profit outlook. In foreign exchange markets, the euro has depreciated in nominal effective terms.

The euro area economic expansion remains solid and broad-based across countries and sectors, despite recent weaker than expected data and indicators. Quarterly real GDP growth moderated to 0.4% in the first quarter of 2018, following growth of 0.7% in the previous quarters. This moderation reflects a pull-back from the very high levels of growth in 2017, compounded by an increase in uncertainty and some temporary and supply-side factors at both the domestic and the global level, as well as weaker impetus from external trade. The latest economic indicators and survey results are weaker, but remain consistent with ongoing solid and broad-based economic growth. The ECB's monetary policy measures, which have facilitated the deleveraging process, continue to underpin domestic demand. Private consumption is supported by ongoing employment gains, which, in turn, partly reflect past labour market reforms, and by growing household wealth. Business investment is fostered by the favourable financing conditions, rising corporate profitability and solid demand. Housing investment remains robust. In addition, the broad-based expansion in global demand is expected to continue, thus providing impetus to euro area exports. The risks surrounding the euro area growth outlook remain broadly balanced. Nevertheless, uncertainties related to global factors, including the threat of increased protectionism, have become more prominent. Moreover, the risk of persistent heightened financial market volatility warrants monitoring.

The June 2018 Eurosystem staff macroeconomic projections for the euro area foresee annual real GDP increasing by 2.1% in 2018, 1.9% in 2019 and 1.7% in 2020. Compared with the March 2018 ECB staff macroeconomic projections, the outlook for real GDP growth has been revised down for 2018 and remains unchanged for 2019 and 2020.

According to Eurostat's flash estimate, euro area annual HICP inflation increased to 1.9% in May 2018, from 1.2% in April. This reflected higher contributions from energy, food and services price inflation. On the basis of current futures prices for oil, annual rates of headline inflation are likely to hover around the current level for the remainder of the year. While measures of underlying inflation remain generally muted, they have been increasing from earlier lows. Domestic cost pressures are strengthening amid high levels of capacity utilisation, tightening labour markets and rising wages. Uncertainty around the inflation outlook is receding. Looking ahead, underlying inflation is expected to pick up towards the end of the year and thereafter to increase 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 June 2018 Eurosystem staff macroeconomic projections for the euro area, which foresee annual HICP inflation at 1.7% in 2018, 2019 and 2020. Compared with the March 2018 ECB staff macroeconomic projections, the outlook for headline HICP inflation has been revised up notably for 2018 and 2019, mainly reflecting higher oil prices.

The monetary analysis showed broad money growth gradually declining in the context of reduced monthly net asset purchases, with an annual rate of growth of M3 at 3.9% in April 2018, after 3.7% in March and 4.3% in February. While the slower momentum in M3 dynamics over recent months mainly reflects the reduction in the monthly net asset purchases since the beginning of the year, M3 growth continues to be supported by the impact of the ECB's monetary policy measures and the low opportunity cost of holding the most liquid deposits. Accordingly, the narrow monetary aggregate M1 remained the main contributor to broad money growth, although its annual growth rate has receded in recent months from the high rates previously observed. The pass-through of the monetary policy measures put in place since June 2014 continues to significantly support borrowing conditions for firms and households and credit flows across the euro area. This is also reflected in the results of the latest Survey on the Access to Finance of Enterprises in the euro area, which indicates that small and medium-sized enterprises in particular benefited from improved access to financing.

Monetary policy decisions

Based on the regular economic and monetary analyses, the Governing Council made the following decisions. First, as regards non-standard monetary policy measures, the Governing Council will continue to make net purchases under the APP at the current monthly pace of €30 billion until the end of September 2018. The Governing Council anticipates that, after September 2018, subject to incoming data confirming its medium-term inflation outlook, it will reduce the monthly pace of the net asset purchases to €15 billion until the end of December 2018 and then end net purchases. Second, the Governing Council intends to maintain its policy of reinvesting 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 to maintain favourable liquidity conditions and an ample degree of monetary accommodation. Third, the Governing Council decided to keep the key ECB interest rates unchanged and expects them to remain at their present levels at least through the summer of 2019 and in any case for as long as necessary to ensure that the evolution of inflation remains aligned with its current expectations of a sustained adjustment path.

1 External environment

While the global economic expansion has continued, recent data point to a slight softening of momentum. Global financial conditions have remained supportive but have tightened in some emerging economies. The increase in oil prices, a reflection of still resilient global demand but also concerns about future supply in view of current geopolitical tensions, has dampened prospects in oil-importing economies. Nonetheless, the near-term global outlook remains essentially solid, supported by accommodative monetary policies in advanced economies and significant fiscal stimulus in the United States. Further ahead, global activity is expected to slow, as output is close to potential in many advanced economies. Moreover, although a further recovery in some commodity-exporting economies is envisaged, China's anticipated transition to a lower growth path should weigh on the outlook. Global inflationary pressures are expected to rise slowly as spare capacity diminishes. Global trade growth is foreseen to remain resilient in the near term. However, the implementation of higher trade tariffs and the possibility of wider protectionist measures represent a key risk to global growth momentum. Indeed, the balance of risks for global activity and trade in the short term has worsened recently, with risks remaining skewed to the downside in the medium term.

Global economic activity and trade

Following a year of strong and highly synchronised growth, global momentum slowed somewhat in the early part of 2018. Data for the first quarter suggest that global activity was slightly weaker than expected. GDP growth in the United States slowed to 0.5%, quarter on quarter, driven by a deceleration in consumer spending, which may have reflected delayed tax refunds and the residual seasonality that has affected first quarter estimates of GDP in recent years. In the United Kingdom growth in activity also moderated, while Japan registered the first quarter-on-quarter fall in GDP in two years. In both cases, adverse weather may have played a role in constraining construction and consumption. By contrast, China's economy expanded at a robust pace, with GDP growing by 6.8% year on year.

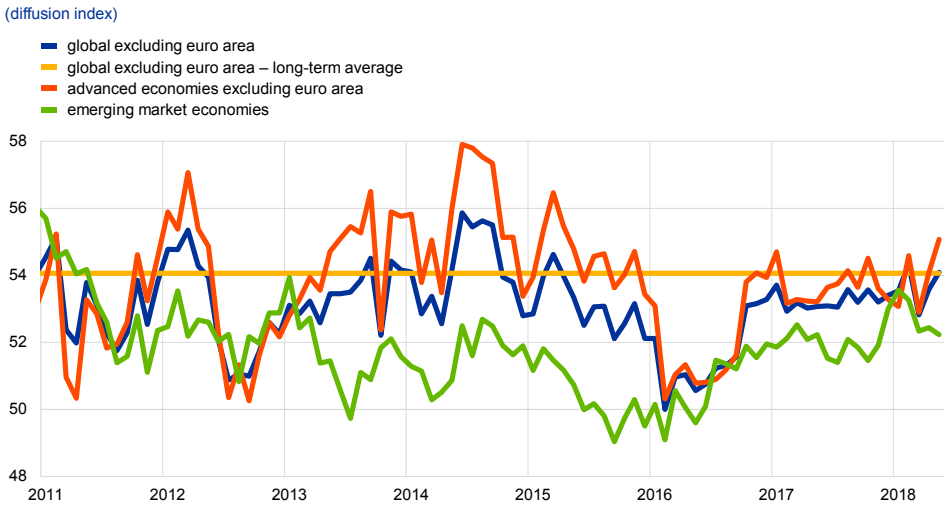
In the near term, the global economic expansion is expected to rebound. Survey data point to sustained growth over the coming quarters. The global composite output Purchasing Managers' Index (PMI) fell in March but rose in April and May, remaining above the long-run average (see Chart 1). Sentiment indicators also remained upbeat, with consumer confidence close to historical highs.

The implementation of higher trade tariffs, amid ongoing discussions of further protectionist measures, represents a risk to the global economic outlook. In March, President Trump signed an order to impose import tariffs of 25% on steel and 10% on aluminium. While a number of countries were initially exempt, the United States has since decided to extend the tariffs to include the European Union, Canada and Mexico. Affected countries have pledged to increase tariffs in retaliation. The measures implemented so far affect only a small proportion of global trade and are expected to have only a small global macroeconomic effect. However,

the risks of further protectionist steps have risen. Following a study of China's intellectual property practices, the United States threatened to increase tariffs on USD 50 billion of Chinese goods, to which China pledged to retaliate. In addition, the United States launched an investigation into the national security implications of automobile imports. In both cases, nothing had been implemented by the end of the review period. Nonetheless, expectations of an escalation in the dispute could affect investment decisions, with potential effects on global growth. Looking ahead, the risks to global activity from a widespread rise in protectionism could be significant.

Chart 1

Global composite output PMI



Sources: Haver Analytics, Markit and ECB staff calculations.
Notes: The latest observations are for May 2018. "Long-term average" refers to the period from January 1999 to May 2018.

The global outlook continues to be supported by accommodative but somewhat tighter monetary policies. The Federal Open Market Committee raised interest rates at its March and June 2018 meetings. The Federal Funds futures curve suggests markets continue to anticipate gradual monetary tightening, with at least one more rate hike during 2018 largely priced in by futures markets and a rising probability of two more rate increases this year. Market expectations also suggest a rise in UK rates in the coming months. By contrast, the Bank of Japan still maintains a very accommodative stance. Among emerging market economies, China has continued to see a tightening of domestic financial conditions to tackle risks in the financial system, with interest rates rising again in March – although money market rates have declined moderately in recent weeks. Policy interest rates have also risen in Turkey and Argentina, as the financial environment has deteriorated. However, official rates in Brazil and Russia were cut further in March amid subdued inflationary pressures.

Despite continued monetary accommodation, global financial conditions have tightened in recent weeks, particularly in emerging market economies. Global equity markets have remained fairly resilient, with the Standard & Poor's 500 still higher than at the start of the year. However, long-term bond yields in major advanced economies have risen. In the United States, the yield on ten-year

government bonds has increased by around 50 basis points since the start of the year. The combination of rising interest rates and the strengthening of the US dollar has contributed to tighter financial conditions in emerging market economies. After a sustained recovery over the past year, capital inflows to emerging market economies slowed in April, while the spreads on bonds issued by them widened. At this time, severe financial market volatility has been restricted to a few countries, such as Argentina and Turkey, which markets appear to judge as vulnerable given high rates of inflation and sizeable external financing needs. Nonetheless, financial conditions have tightened for most emerging market economies during this period.

Oil prices have risen sharply in the past two months, although they have seen a moderation more recently. Compared with the early part of this year, the increase has, in part, reflected resilient global demand. At the same time, oil supply has been largely unchanged, as output cuts stemming from the agreement between OPEC members and other oil-producing countries were offset by an increase in production in the United States. Pressure on the spot price rose further in mid-May, when the United States decided to withdraw from the Joint Comprehensive Plan of Action imposing sanctions on Iran. Subsequently, news that OPEC, Russia and their partners are discussing the possibility of ending the production cuts has driven the price down. Past experience suggests that oil price increases driven by shifts in supply or uncertainties about future supply have tended to be associated with weaker global activity, while demand-driven price increases have, in general, not fully offset the stronger global demand.[1] With the recent oil price increase reflecting both resilient global demand and precautionary effects associated with uncertainty about future supply, the net impact of the higher oil price on the global economy is judged to be modest overall. Nonetheless, the change in oil prices is likely to have some distributional effects across countries, with the outlook for oil exporters strengthening in particular.

Looking ahead, broad-based cyclical momentum is expected to support global activity in the near term. Despite the moderation in activity early in the year, the near-term global outlook remains essentially solid, driven by sound fundamentals. Advanced economies continue to benefit from accommodative monetary policies and, although financial conditions have tightened in recent weeks, they remain supportive for the global economy. A significant fiscal stimulus in the United States, following agreements on tax reform and increased expenditure, is also projected to provide impetus to global growth. The rise in oil prices has slightly dampened prospects in oil-importing economies. By contrast, the improvement in terms of trade is expected to help stabilise investment in many oil-exporting economies as they recover from deep recessions. Moreover, many emerging market economies, particularly China and other export-oriented Asian economies, are benefiting from the tailwinds of the global trade revival.

Over the medium term, however, the positive momentum is expected to slow as cyclical forces wane. Output gaps have already closed in many advanced economies, and spare capacity is expected to contract across emerging market

[1] See the box entitled "Global implications of low oil prices", *Economic Bulletin*, Issue 4, ECB, 2016.

economies in the coming quarters. Moreover, policy support will gradually diminish. In the United States, the boost to growth from the fiscal stimulus is expected to peak in 2019; in Japan, the effects of the fiscal stimulus are expected to fade this year. China's transition to a lower growth path that is less dependent on credit and fiscal stimulus will also weigh on the global outlook. Over the medium term, the pace of global expansion will settle to below pre-crisis rates.

Turning to developments across countries, in the United States, activity is expected to rebound this year. The upward pressure of tight labour market conditions on wage growth, together with continued improvement in investment and still favourable financial conditions are expected to support domestic demand. Moreover, the fiscal policy changes, including the tax reform and the two-year budget deal, are expected to boost the growth outlook.

In the United Kingdom, economic prospects remain relatively subdued against the background of uncertainties related to the process of the country leaving the European Union. Real GDP growth is expected to rebound modestly after the weak outturn in the first quarter of this year. Thereafter, the outlook is one of moderate growth, as an expected moderation in inflation and a pick-up in wage growth provide some support for private consumption.

In Japan, the economic expansion is projected to decelerate gradually. In the near term, activity is expected to rebound after the weak first-quarter outcome, supported by the accommodative monetary policy stance. Further ahead, growth is projected to decelerate as fiscal support wanes and spare capacity diminishes. Wages are rising moderately in the context of a tightening labour market, which is expected to support household spending and contribute towards a modest increase in inflation.

Economic activity in central and eastern European countries is foreseen to remain robust. GDP growth will be supported by strong investment linked to the absorption of EU funds. In addition, solid consumer spending is projected to be boosted by improvements in the labour market.

In China, activity is projected to decelerate moderately. Output has recently been supported by strong consumption, government support and solid export performance, which have offset the effects of a mild slowdown in housing market activity amid slowing credit growth and tightening financial conditions. Further ahead, the pace of expansion is foreseen to slow gradually, consistent with the emphasis of China's leadership on accepting slower expansion in order to reduce risks and address imbalances in the economy.

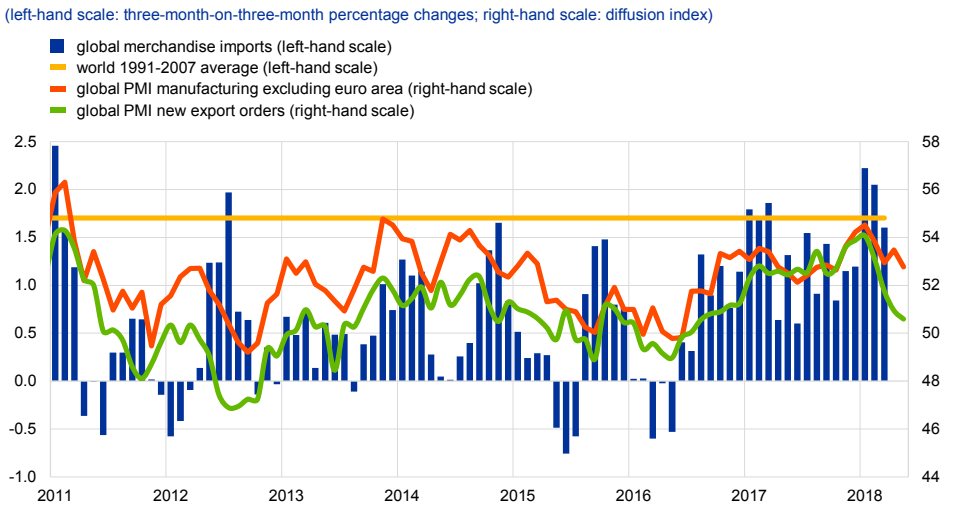
Economic activity is gradually strengthening in the large commodity-exporting countries. In Russia, despite the moderation in the pace of growth in the second half of 2017, the outlook is supported by rising oil prices, declining inflation and improving business and consumer confidence. Over the medium term, economic activity is expected to expand moderately amid the fiscal challenges weighing on the business environment. In Brazil, labour market improvements and continuing monetary accommodation should support consumption, against the backdrop of

moderate inflationary pressures. The stabilisation in commodity prices and terms of trade should also be supportive of activity over the forecast horizon. At the same time, political uncertainty and the reversal of previously benign external financial conditions are expected to weigh on demand.

Recent indicators suggest a slight softening of global trade momentum in the near term. According to CPB Netherlands Bureau for Economic Policy Analysis, having risen strongly in January and February, growth in merchandise imports fell to 1.6% in March (in three-month-on-three-month terms). Other indicators have also pointed to a moderation in global trade during the first few months of 2018 (see Chart 2).

Chart 2

World trade in goods



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

Further ahead, global imports are projected to slow gradually, consistent with the projected cyclical deceleration in global activity. In the past, global trade has exhibited pronounced pro-cyclicality. Recent trade outcomes are consistent with that experience: as global activity recovered in 2015 and 2016, global trade rebounded, rising even faster than global output. Looking ahead, as the global expansion moderates, world trade growth is also foreseen to slow. Over the medium term, trade projections are anchored around the view that global imports will grow broadly in line with activity. This is in line with the evidence that the longer-term structural factors that previously drove the fast expansion of global trade, including trade liberalisation, reductions in tariffs and transportation costs and the expansion of global value chains, have waned since the financial crisis. However, risks have increased. In particular, the outlook for trade will depend on how discussions over trade tariffs progress.

Overall, global growth is projected to remain broadly stable over the projection horizon. According to the June 2018 Eurosystem staff macroeconomic projections, world real GDP growth (excluding the euro area) is expected to increase from 3.8% in 2017 to 4.0% in 2018, before declining to 3.9% and 3.7% in 2019 and 2020

respectively. This projection path reflects the expected slowdown in activity in advanced economies and the expected structural slowdown in China, partly offset by a modest gain in dynamism in emerging market economies. Growth in euro area foreign demand is forecast to expand by 5.2% in 2018, 4.3% in 2019 and 3.7% in 2020. Compared with the March 2018 projections, global GDP growth has been revised downwards for 2018 and 2019, reflecting weaker than expected growth in the short term. Growth in euro area foreign demand has been revised upwards slightly over the whole projection horizon, reflecting expectations of more trade-intensive growth in some central and eastern European economies.

The balance of risks for global activity has worsened in recent weeks, with risks judged to be balanced in the short term but skewed to the downside in the medium term. On the upside, the US fiscal package could have a stronger impact on activity than expected. However, the near-term prospects of greater trade protectionism have increased, which could have a significant impact on global activity and trade. Other downside risks relate to the possibility of a further tightening of global financial conditions, disruptions associated with China's reform process and geopolitical uncertainties associated, in particular, with Brexit-related risks.

Global price developments

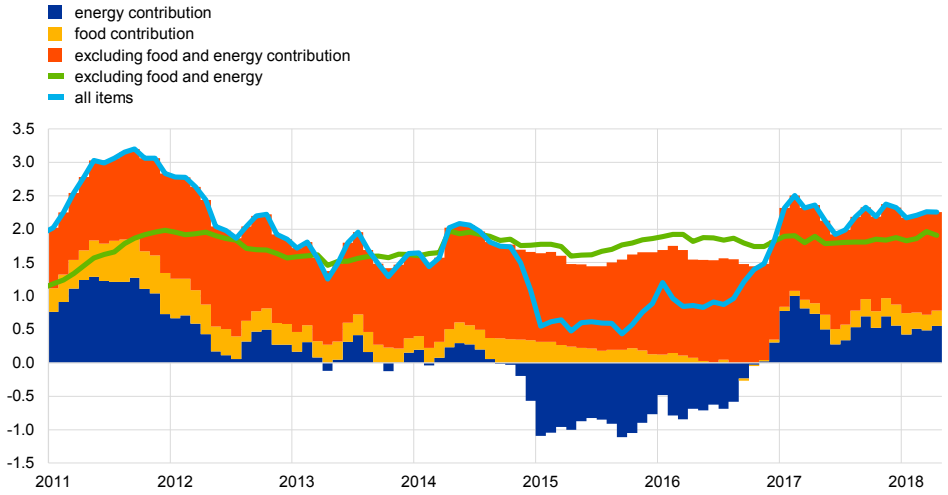
Global consumer price inflation has been broadly stable in recent months. In the OECD area, headline inflation rose to 2.3% in April. Excluding food and energy, OECD inflation fell slightly to 1.9% (see Chart 3). At the same time, despite tightening labour markets across advanced economies, wage pressures remain relatively subdued.

Looking ahead, global inflation is expected to rise in the near term. In the short term, inflation is foreseen to increase following the sharp pick-up in oil prices. Later on, however, the current oil futures curve anticipates falling oil prices over the projection horizon, pointing to a negative contribution from energy prices to inflation. However, slowly diminishing spare capacity at the global level is expected to support underlying inflation.

Chart 3

OECD consumer price inflation

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



Source: OECD.
Note: The latest observation is for April 2018.

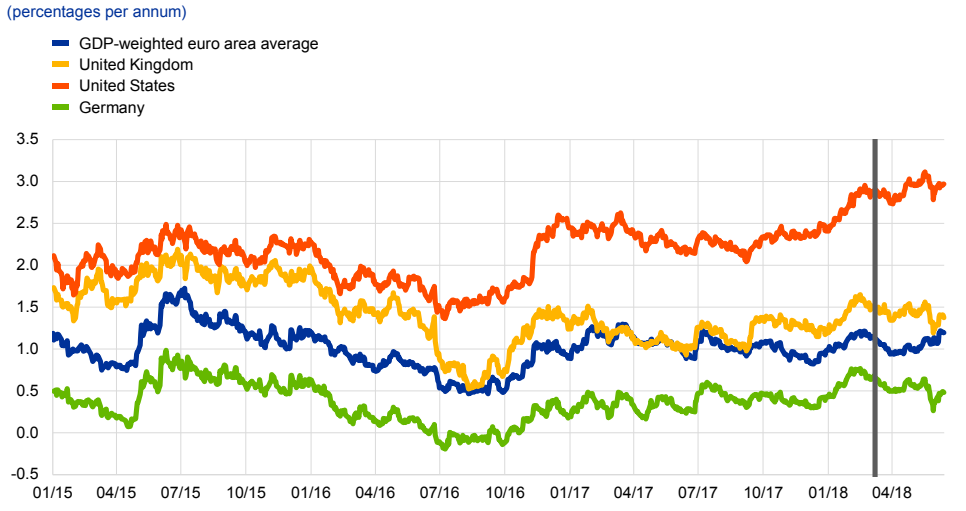
2 Financial developments

Since the Governing Council's meeting in March 2018, euro area long-term risk-free rates have decreased. An uptick in market-based measures of long-term inflation expectations was balanced by a decrease in real rates. Sovereign bond spreads have exhibited considerable volatility since the second half of May, against a background of political uncertainty in Italy. The fluctuations in government bond markets have spilled over into other market segments to some extent and stock market volatility has increased. Equity and bond prices of euro area financial corporations have declined, while the impact on other market segments has remained limited. At the same time, stock prices of euro area non-financial corporations (NFCs) have risen, reflecting a robust corporate profit outlook. In foreign exchange markets, the euro has depreciated in nominal effective terms.

Long-term government bond yields have increased in the euro area and in the United States (see Chart 4). During the period under review (from 8 March to 13 June), the GDP-weighted euro area ten-year sovereign bond yield increased by 11 basis points to 1.20%. Likewise, the ten-year government bond yield in the United States increased by 11 basis points to 2.97%, leaving its spread vis-à-vis the corresponding euro area yield at historically high levels.

Chart 4

Ten-year sovereign bond yields



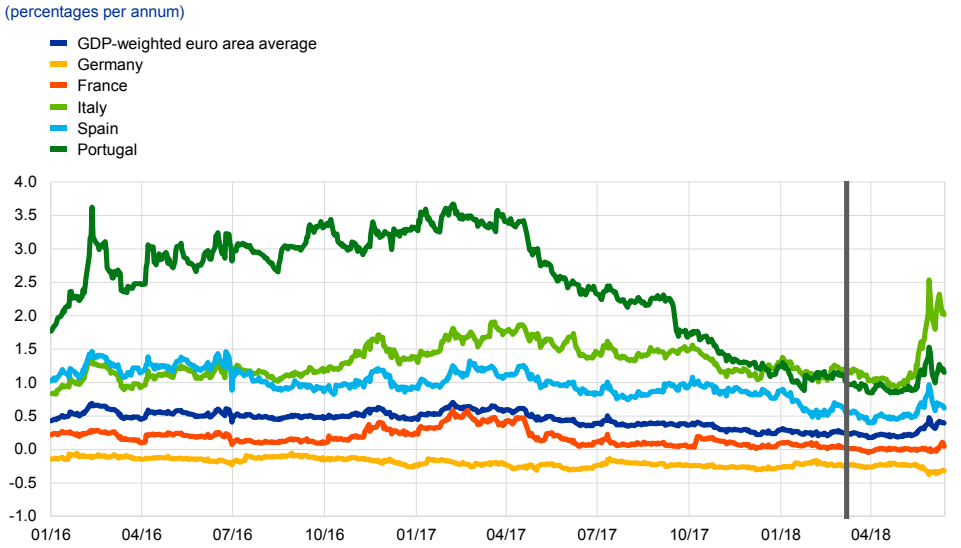
Sources: Thomson Reuters and ECB calculations.
Notes: Daily data. The vertical grey line denotes the start of the review period (i.e. 8 March 2018). The latest observation is for 13 June 2018.

Euro area GDP-weighted sovereign bond spreads relative to the risk-free OIS rate have been volatile. Overall they have risen since early March. After experiencing comparatively moderate fluctuations over the first part of the review period, spreads of Italian sovereign bonds rose substantially after 15 May when markets became aware of details of a draft programme being put forward by the incoming government (see Chart 5). Since then sovereign bond market conditions have remained volatile, with Italian sovereign spreads considerably above their April levels. Government bond markets in other euro area countries have also been

affected to different degrees. Overall, since 8 March the GDP-weighted average of ten-year sovereign bond yields has increased by 17 basis points to stand at 40 basis points on 13 June.

Chart 5

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



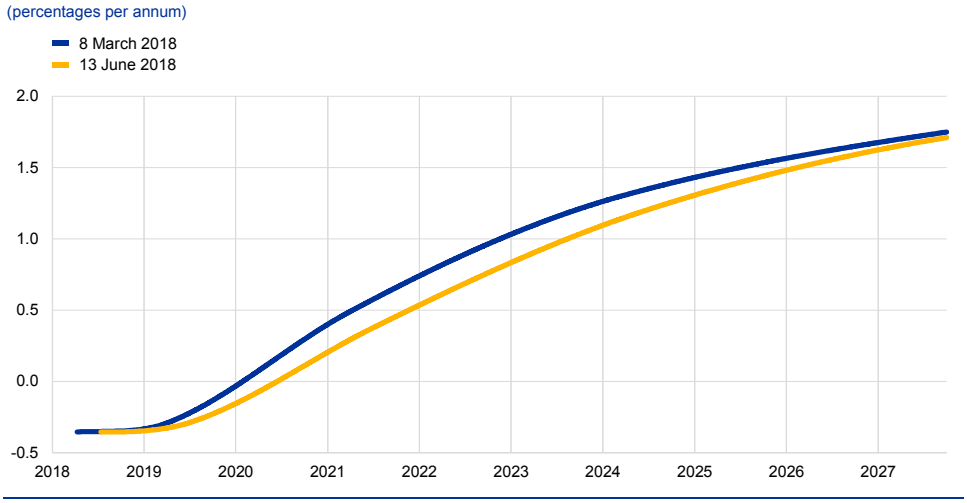
Sources: Thomson Reuters and ECB calculations.
Notes: The spread is calculated by subtracting the ten-year OIS rate from the sovereign yield. The vertical grey line denotes the start of the review period (8 March 2018). The latest observation is for 13 June 2018.

The euro overnight index average (EONIA) forward curve shifted down during the review period. The curve remains below zero for horizons prior to 2020, reflecting market expectations of a prolonged period of negative rates (see Chart 6).

The EONIA averaged -36 basis points over the review period. Excess liquidity increased slightly, rising by about €17 billion to around €1,903 billion. This increase was attributable to ongoing securities purchases under the Eurosystem's asset purchase programme. Liquidity conditions are discussed in more detail in Box 1.

Chart 6

EONIA forward rates

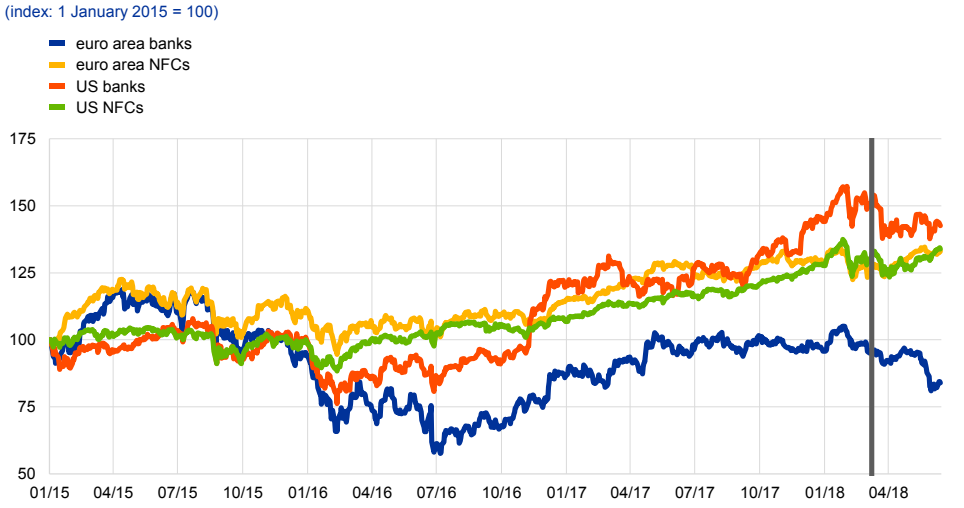


Sources: Thomson Reuters and ECB calculations.

Equity indices for euro area NFCs rose over the review period. By contrast, financial corporation equity indices experienced a substantial decline, mainly in the wake of recent tensions in euro area sovereign debt markets. Euro area equity market volatility increased in March and again towards the end of May, amid the ongoing fluctuations in sovereign bond markets (see Chart 7). However, market volatility remained below the levels observed in February, when a correction was triggered by market perceptions of rising inflation. Over the review period, equity prices of euro area NFCs increased by around 2%. Overall, a robust corporate profit outlook continues to support euro area equity prices, reflecting a favourable euro area macroeconomic environment. Financials were influenced by sovereign debt market tensions, resulting in a decrease of around 12% over the review period. Against this background, in the United States equity prices of NFCs rose by around 1%, while those of financial corporations declined by 5%.

Chart 7

Euro area and US equity price indices

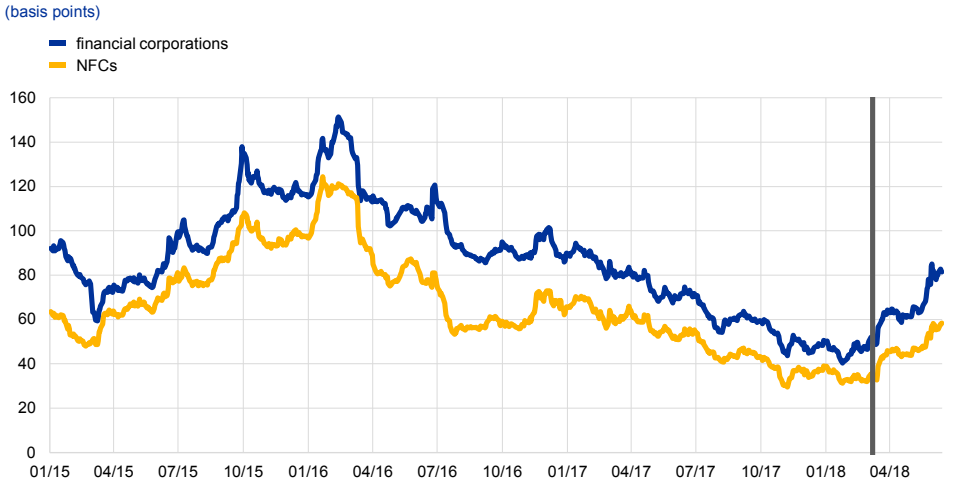


Sources: Thomson Reuters and ECB calculations.
Notes: The vertical grey line denotes the start of the review period on 8 March 2018. The latest observation is for 13 June 2018.

Yield spreads on bonds issued by NFCs have been less affected by recent sovereign bond market tensions. Since late April, the spread on investment-grade NFC bonds relative to the risk-free rate has increased by 23 basis points to stand at 58 basis points (see Chart 8). Yields on financial sector debt have increased somewhat more, resulting in a widening of the spread by around 32 basis points. However, corporate bond spreads remain significantly below the levels observed in March 2016, prior to the announcement and subsequent launch of the corporate sector purchase programme.

Chart 8

Euro area corporate bond spreads



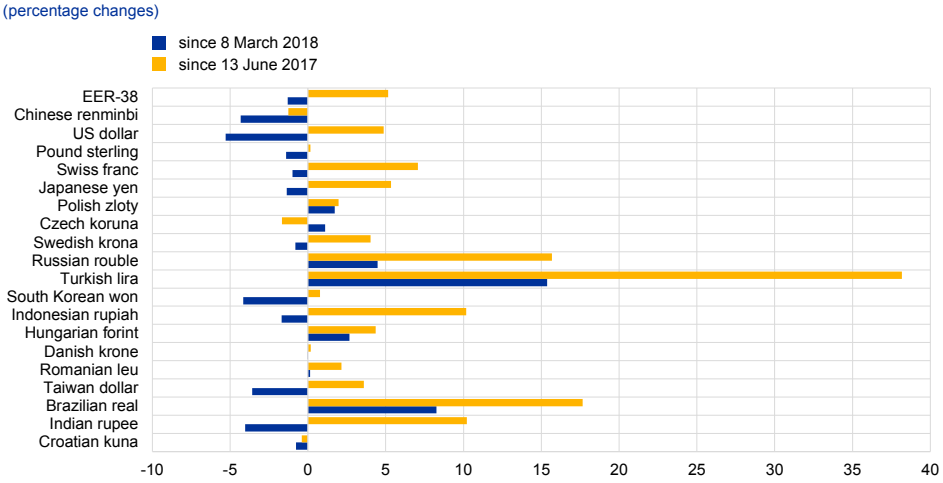
Sources: iBoxx indices and ECB calculations.
Notes: The vertical grey line denotes the start of the review period on 8 March 2018. The latest observation is for 13 June 2018.

In foreign exchange markets, the euro weakened slightly in trade-weighted terms (see Chart 9). Over the review period, the nominal effective exchange rate of

the euro, measured against the currencies of 38 of the euro area's most important trading partners, depreciated by 1.3%. This development largely reflected a weakening of the euro vis-à-vis major currencies, in particular the US dollar (-5.3%) and the Chinese renminbi (-4.3%), and partly unwound the currency's appreciation since June 2017. The euro also depreciated against the British pound (-1.4%), the Japanese yen (-1.4%) and the Swiss franc (-1.0%). The depreciation against the currencies of the euro area's largest trading partners was only partly offset by a pronounced strengthening of the euro against the currencies of some emerging markets, most notably the Turkish lira (15.4%), the Brazilian real (8.3%) and the Russian rouble (4.5%), as well as by a more moderate strengthening against the currencies of some non-euro area EU Member States.

Chart 9

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



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 have been calculated using the foreign exchange rates prevailing on 13 June 2018.

3 Economic activity

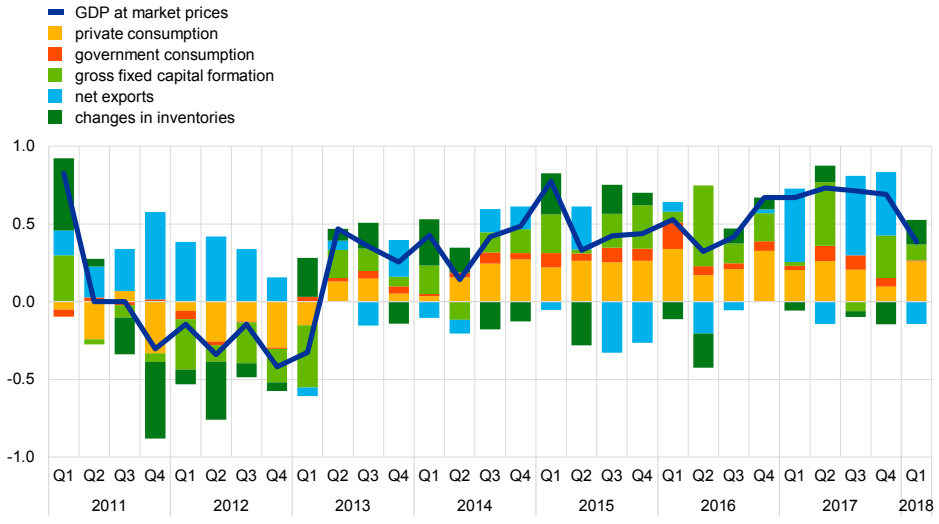
Despite recent weaker than expected data and indicators, the euro area economic expansion remains solid and broad-based across countries and sectors after a period of growth rates well above potential growth. Euro area real GDP growth is supported primarily by growth in private consumption and investment. The latest survey results and incoming data point to more moderate but still solid growth momentum in the near term. The June 2018 Eurosystem staff macroeconomic projections for the euro area foresee annual real GDP increasing by 2.1% in 2018, 1.9% in 2019 and 1.7% in 2020. Compared with the March 2018 ECB staff macroeconomic projections, the outlook for real GDP growth has been revised down for 2018 and remains unchanged for 2019 and 2020.

Growth moderated in the first quarter of 2018, but remained solid and broad-based across euro area countries. Real GDP increased by 0.4%, quarter on quarter, in the first quarter of this year, following growth of 0.7% in the previous quarter (see Chart 10). The slowdown in growth at the start of the year appears to have been related to temporary factors, as well as more lasting cyclical factors (see Box 2). Domestic demand (notably private consumption and fixed investment spending) continued to be the main engine of growth in the first quarter of 2018. Changes in inventories made a positive contribution to real GDP growth in the first quarter, whereas net trade made a negative contribution. On the production side, economic activity was mainly supported by robust growth in the services and construction sectors, while value added in industry (excluding construction) contracted somewhat.

Chart 10

Euro area real GDP and its components

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



Source: Eurostat.
Note: The latest observations are for the first quarter of 2018.

Employment growth remained robust in the first quarter of the year. Employment growth rose further, increasing by 0.4%, quarter on quarter, in the first

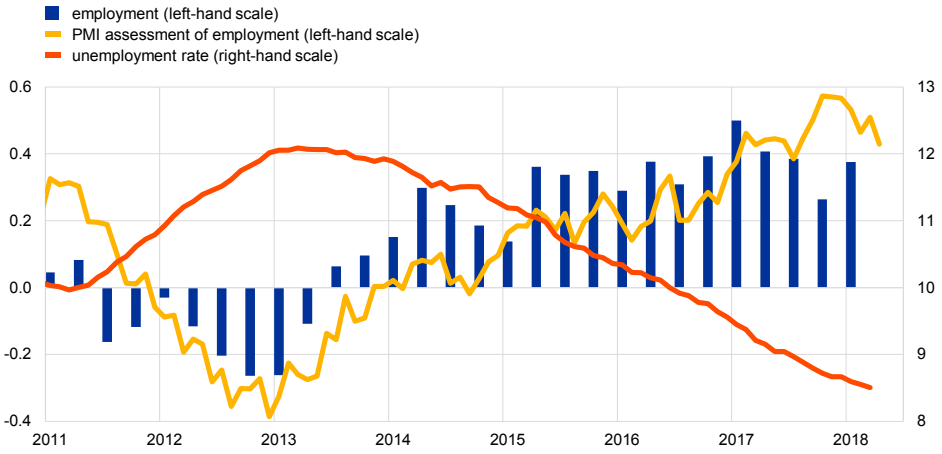
quarter of 2018 (see Chart 11), and stands 1.9% above the pre-crisis peak recorded in the first quarter of 2008. Employment increased in most euro area countries and the increase was broadly based across sectors. With the latest increase, cumulative employment growth in the euro area since the trough recorded in the second quarter of 2013 amounts to 8.4 million. The strong employment growth seen during the recovery was accompanied by broadly stable average hours worked, which reflects primarily the impact of several structural factors (for example, the large share of part-time workers in total employment and other compositional effects).

Short-term indicators point to continuing strength in the labour market in the second quarter of 2018. The euro area unemployment rate continued to decline and stood at 8.5% in April – the lowest level seen since December 2008. The decline was broad-based across age and gender groups and unemployment durations. Survey indicators have moderated somewhat from very high levels, but still point to continued employment growth in the second quarter of 2018. In that context, signs of labour shortages have increased in some countries and sectors.

Chart 11

Euro area employment, PMI assessment of employment, and unemployment

(quarter-on-quarter percentage changes; diffusion index; percentages of the labour force)



Sources: Eurostat, Markit and ECB calculations.
Notes: The Purchasing Managers' Index (PMI) is expressed as a deviation from 50 divided by 10. The latest observations are for the first quarter of 2018 for employment, May 2018 for the PMI and April 2018 for the unemployment rate.

Developments in private consumption continue to be driven by the recovery in the labour market and stronger household balance sheets. Private consumption rose by 0.5%, quarter on quarter, in the first quarter of 2018, following somewhat weaker growth in the last quarter of 2017. Recent developments in retail trade and new passenger car registrations pose negative risks. However, from a longer-term perspective, increasing labour income is supporting the solid underlying momentum in consumer spending, which is also reflected in elevated consumer confidence. In addition, the strengthening of household balance sheets remains an important factor for steady consumption growth, since households' creditworthiness is a key determinant of their access to credit.

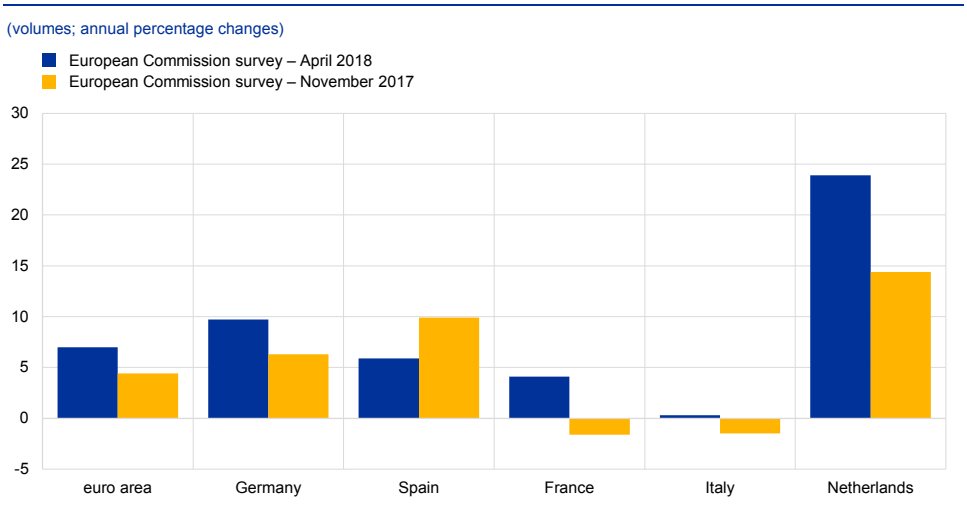
The ongoing recovery in housing markets is expected to continue to drive growth. Housing investment increased by 1.2% in the first quarter of 2018, reflecting

the continuing recovery in many euro area countries and in the euro area as a whole. Recent short-term indicators and survey results point to positive but decelerating momentum. Construction production in the buildings segment recorded its third consecutive decline in March, falling by 0.3%, month on month. In contrast, Purchasing Managers' Index (PMI) indicators for construction output rose in May, extending the current period of expansion to a year and a half, with a similar pattern seen for the PMI indicator for housing output. The European Commission's construction confidence indicator for the buildings construction segment increased in May. Both the PMI indicators and the confidence indicator remain clearly above their long-run averages.

Business investment is expected to continue to grow, supported by favourable earnings expectations, solid demand and accommodative financing conditions. According to the euro area sectoral accounts for the fourth quarter of 2017, business margins (measured as the ratio of the net operating surplus to value added) remained elevated. Furthermore, earnings expectations for listed companies in the euro area are still at high levels. Moreover, increasing capacity utilisation and rising orders in the capital goods sector, as well as strong confidence and demand, signal overall a continuation of the dynamic investment momentum. The latest information from the April 2018 European Commission industrial investment survey points to expectations of a strong increase in real manufacturing investment of 7.0% in the euro area in 2018, which is an upward revision compared with the previous survey conducted in November 2017. Investment is expected to increase in 2018 in most large euro area countries and in the euro area as a whole (see Chart 12).

Chart 12

Plans for real industrial investment in 2018



Source: European Commission industrial investment survey.

Euro area export growth weakened in the first quarter of 2018. Following a sustained expansion in the second half of 2017, euro area total real export growth decreased by 0.4% in the first quarter of 2018. The deceleration was driven mainly by goods exports, which fell by 0.6%, quarter on quarter. The decline in extra-euro area exports of goods in February and March was broad-based across a large

number of destinations. Survey indicators for global and euro area new manufacturing orders confirm a more moderate trend in exports in the second quarter.

The latest economic indicators and survey results are weaker, but remain consistent with ongoing solid and broad-based economic growth. Industrial production (excluding construction) declined in April. The decline was fairly broadly based across sectors and across the larger euro area countries. The European Commission's Economic Sentiment Indicator (ESI) and the composite output PMI both declined throughout the first quarter and continued to decline, albeit at a somewhat slower pace, in April and May. Both indicators remain above their long-term averages.

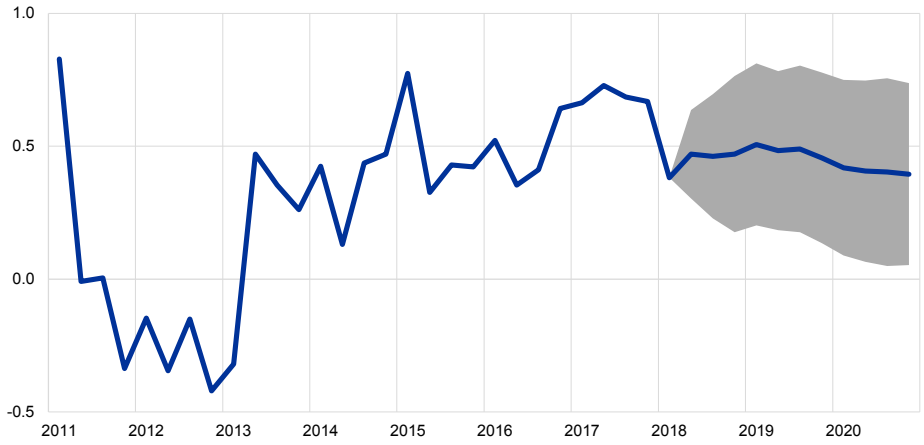
The ongoing solid and broad-based economic growth is expected to continue. The ECB's monetary policy measures, which have facilitated the deleveraging process, continue to underpin domestic demand. Private consumption is supported by ongoing employment gains, which, in turn, partly reflect past labour market reforms, and by growing household wealth. Business investment is fostered by the favourable financing conditions, rising corporate profitability and solid demand. Housing investment remains robust. In addition, the broad-based increase in global demand is expected to continue, thus providing impetus to euro area exports. The risks surrounding the euro area growth outlook remain broadly balanced. Nevertheless, uncertainties related to global factors, including the threat of increased protectionism, have become more prominent. Moreover, the risk of persistent heightened financial market volatility warrants monitoring.

The June 2018 Eurosystem staff macroeconomic projections for the euro area foresee annual real GDP increasing by 2.1% in 2018, 1.9% in 2019 and 1.7% in 2020 (see Chart 13). Compared with the March 2018 ECB staff macroeconomic projections, projected real GDP growth has been revised down for 2018 and remains unchanged for 2019 and 2020.

Chart 13

Euro area real GDP (including projections)

(quarter-on-quarter percentage changes)



Sources: Eurostat and the article entitled "Eurosystem staff macroeconomic projections for the euro area, June 2018", published on the ECB's website on 14 June 2018.
Notes: The ranges shown around the central projections are based on the differences between actual outcomes and previous projections carried out over a number of years. The width of the range is twice the average absolute value of these differences. The method used for calculating the ranges, involving a correction for exceptional events, is documented in "New procedure for constructing Eurosystem and ECB staff projection ranges", ECB, December 2009, available on the ECB's website.

4 Prices and costs

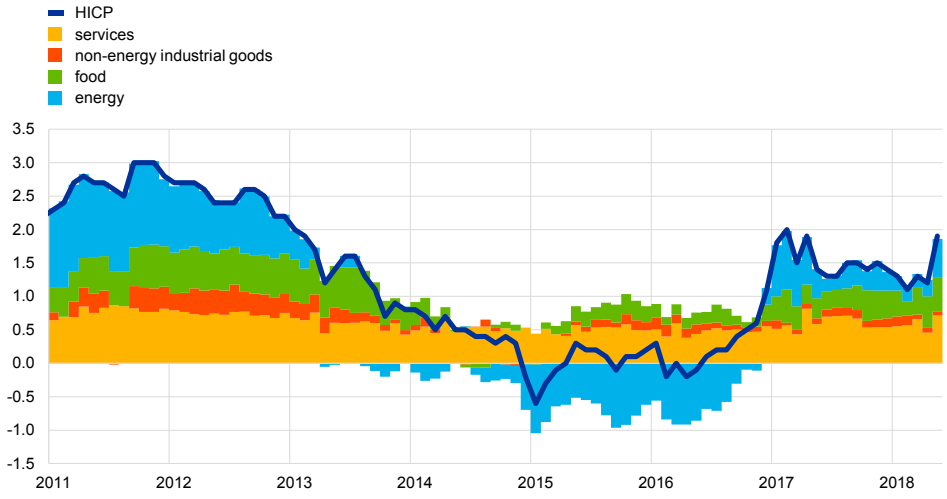
According to Eurostat's flash estimate, euro area annual HICP inflation increased to 1.9% in May 2018, from 1.2% in April. On the basis of current futures prices for oil, annual rates of headline inflation are likely to hover around the current level for the remainder of the year. While measures of underlying inflation remain generally muted, they have increased from earlier lows. Domestic cost pressures are strengthening amid high levels of capacity utilisation, tightening labour markets and rising wages. Uncertainty about the inflation outlook is receding. Looking ahead, underlying inflation is expected to pick up towards the end of the year and thereafter to increase 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 June 2018 Eurosystem staff macroeconomic projections for the euro area, which foresee annual HICP inflation at 1.7% in 2018, 2019 and 2020, and HICP inflation excluding energy and food at 1.1%, 1.6% and 1.9% respectively.

Headline inflation increased considerably in May. According to Eurostat's flash estimate, euro area annual HICP inflation increased strongly, rising from 1.2% in April to 1.9% in May 2018 – the highest rate recorded since April 2017 (see Chart 14). The increase in May reflected higher contributions from services and food price inflation and, in particular, from energy inflation. The increase in energy inflation reflected both a strong month-on-month increase in energy prices, owing to higher oil prices, and an upward base effect.

Chart 14

Contributions of components of euro area headline HICP inflation

(annual percentage changes; percentage point contributions)



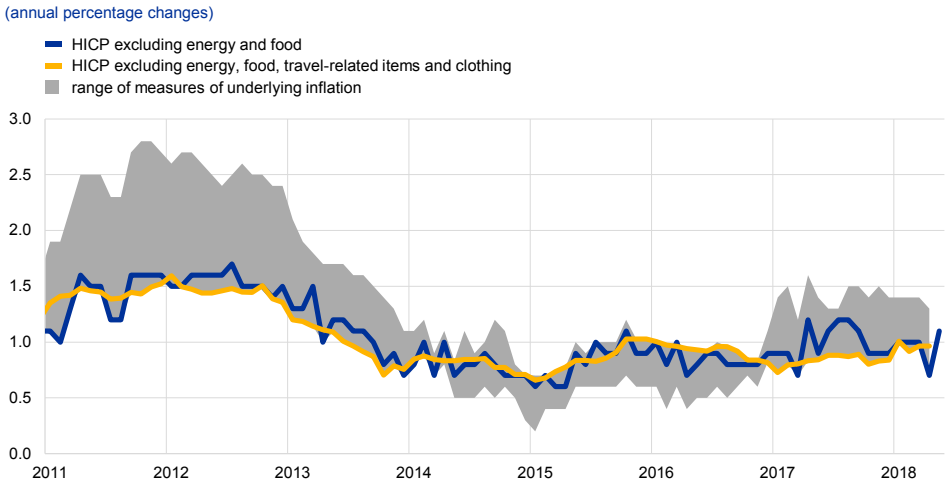
Sources: Eurostat and ECB calculations.
Note: The latest observations are for May 2018 (flash estimates).

Measures of underlying inflation have remained generally muted but have increased from their earlier lows. After standing at 1.0% for three consecutive months HICP inflation excluding energy and food declined to 0.7% in April but then rebounded to 1.1% in May, according to the flash estimate (see Chart 15). This

pattern mainly reflected volatility owing to the different timing of Easter. HICP inflation excluding energy, food, travel-related items and clothing – with the latter two components tending to be influenced by calendar effects and by the timing of sales periods – remained relatively stable in April (the latest month for which this breakdown was available). Overall, looking beyond the volatility in recent months, measures of underlying inflation have generally remained stable, but have increased from the low levels recorded in 2016.

Chart 15

Measures of underlying inflation



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

Strengthening domestic cost pressures largely offset the increasing downward pressure from the past exchange rate appreciation on non-energy goods price inflation. The impact of the past appreciation of the effective euro exchange rate has been evident in the decline in import price inflation.[2] However, extra-euro area import prices for non-food consumer goods declined only slightly further in annual terms in April 2018, falling to -2.0% (after -1.9% in March). Import price inflation for intermediate goods, which signals price pressures earlier in the domestic production chain, improved somewhat, to stand at -0.8% in April, after -1.5% in March. In contrast to import price inflation, producer price inflation for domestic sales of non-food consumer goods remained resilient to downward pressure from the past euro exchange rate appreciation, likely reflecting rising domestic cost pressures and pricing power in an environment of robust economic growth. Annual producer price inflation for non-food consumer goods was stable at 0.5% between February and April 2018, up from rates of around 0.2% in the second half of 2017. At the consumer level, HICP non-energy industrial goods inflation declined to 0.2% in May, from 0.3% in April. This was lower than the rates observed at the beginning at the year, but the pattern can in part be attributed to strong

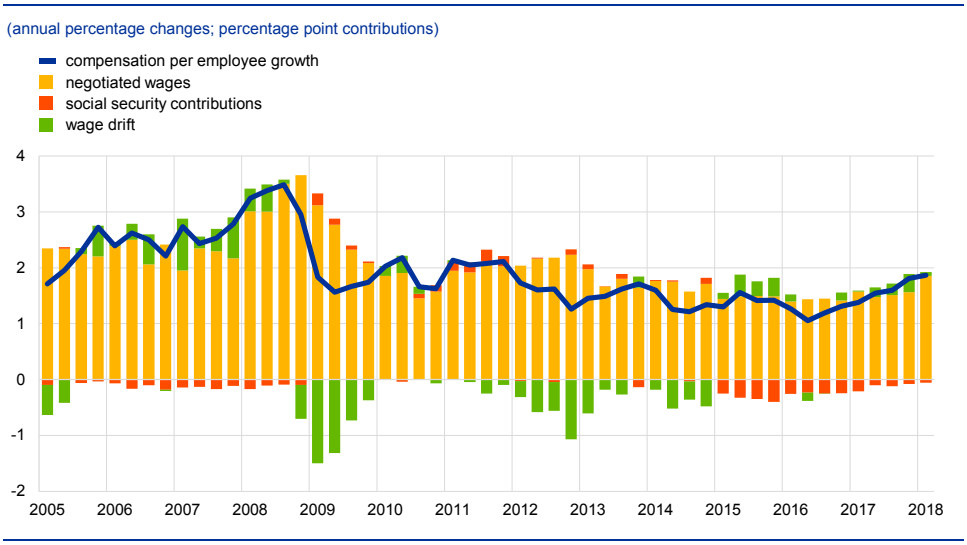
2 For further details, see the box entitled “Monitoring the exchange rate pass-through to inflation” in this issue of the Economic Bulletin.

volatility in annual rates of inflation for the clothing and footwear sub-component, partly owing to changing seasonal sales patterns in recent years.

Recent developments in wage growth data signal a continued upward trend and support the picture of a gradual build-up in domestic cost pressures. Annual growth in compensation per employee was 1.9% in the first quarter of 2018, up from 1.8% in the fourth quarter of 2017, and now stands considerably higher than in the first half of 2016 (see Chart 16). This increase mirrors the rise in the annual growth of negotiated wages (which was 1.9% in the first quarter of 2018, up from 1.6% in the fourth quarter of 2017), and recent wage agreements in euro area countries support the expectation of a further pick-up in wage growth. Overall, recent developments in wage growth echo improving labour market conditions, as other factors that weighed on wage growth, including past low inflation and the ongoing impacts from labour market reforms implemented in some countries during the crisis, begin to fade.

Chart 16

Contributions of components of compensation per employee



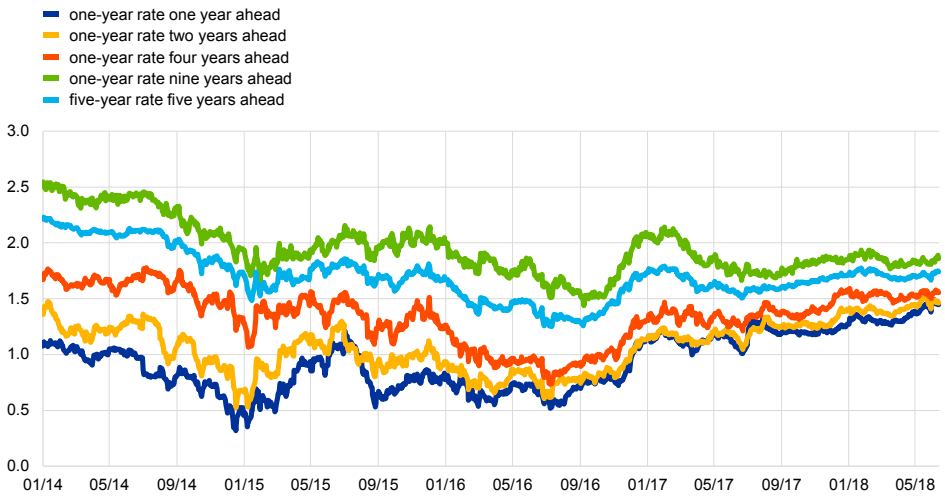
Sources: Eurostat and ECB calculations.
Note: The latest observations are for the first quarter of 2018.

Both market-based and survey-based measures of longer-term inflation expectations have remained largely unchanged. The five-year forward inflation-linked swap rate five years ahead stood at 1.74% on 12 June 2018, broadly unchanged compared with the end of April (see Chart 17). The forward profile of market-based measures of inflation expectations continues to point to a prolonged period of low inflation, with only a very gradual return to levels below, but close to, 2%. The risk-neutral probability of negative average inflation over the next five years implied by inflation options markets is negligible, suggesting that markets currently consider the risk of deflation to be very low. According to the ECB Survey of Professional Forecasters for the second quarter of 2018, measures of longer-term inflation expectations remained broadly stable, standing at 1.9%. The same result was also reported in the latest Consensus Economics and Euro Zone Barometer surveys.

Chart 17

Market-based measures of inflation expectations

(annual percentage changes)



Sources: Thomson Reuters and ECB calculations.
Note: The latest observations are for 12 June 2018.

The June 2018 Eurosystem staff macroeconomic projections expect HICP inflation to remain flat at 1.7% in each year of the projection horizon (see Chart 18).[3] The profile of the inflation projection conceals two competing developments: a gradual increase in HICP inflation excluding energy and food, which is expected to rise from 1.1% in 2018 to 1.6% in 2019 and 1.9% in 2020, and a declining contribution from energy inflation, given the technical assumption that oil prices will evolve in line with the oil futures curve. The expected rise in underlying price pressures reflects in particular increasing labour market tightness and concomitant wage pressures, especially in some countries. In an environment of robust growth, such labour cost increases are likely to be passed through to consumer prices. Compared with the March 2018 ECB staff macroeconomic projections, HICP inflation has been revised up by 0.3 percentage point for 2018 and 2019, on account of the increase in oil prices and small upward revisions to growth in compensation per employee.

[3] See the article entitled "Eurosystem staff macroeconomic projections for the euro area, June 2018", published on the ECB's website on 14 June 2018.

Chart 18

Euro area HICP inflation (including projections)

(annual percentage changes)

Sources: Eurostat and the article entitled "Eurosystem staff macroeconomic projections for the euro area, June 2018", published on the ECB's website on 14 June 2018.
Note: 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.

5 Money and credit

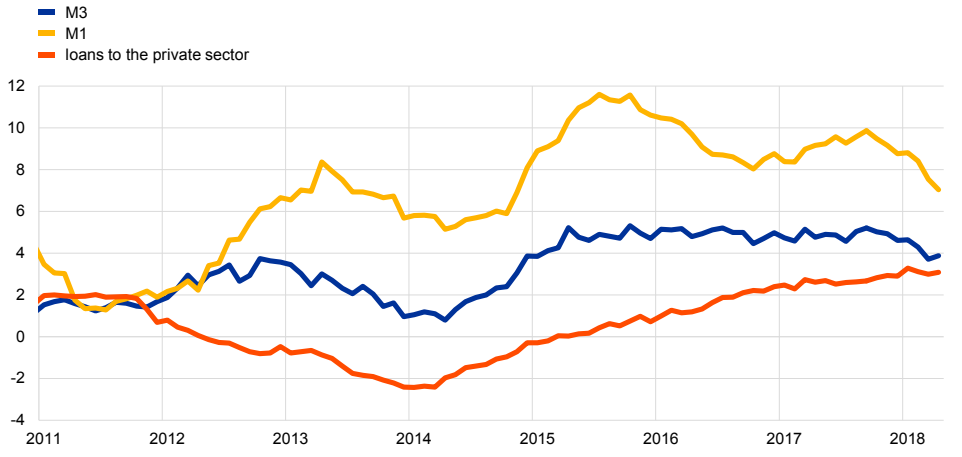
Since the fourth quarter of 2017, broad money growth has been gradually declining in the context of reduced monthly net asset purchases under the asset purchase programme. At the same time, loan growth to the private sector remained on a path of moderate expansion, significantly supported by the pass-through of the monetary policy measures put in place since June 2014. The annual flow of total external financing to non-financial corporations (NFCs) is estimated to have moderated somewhat in the first quarter of 2018.

M3 growth has been gradually declining since the fourth quarter of 2017 in the context of reduced monthly net asset purchases. The annual growth rate of M3 stood at 3.9% in April 2018, compared with 3.7% in March and 4.3% in February (see Chart 19). In March and April, developments in broad money were also driven by base effects, leading to some volatility in the annual growth rates. The reduction in net asset purchases (from €80 billion to €60 billion in April 2017, and then to €30 billion in January 2018) has led to a smaller positive impact on M3 growth, as both the increase in seller deposits (provided the seller belongs to the money-holding sector) and portfolio rebalancing effects have tended to become less pronounced.[4] At the same time, money growth remained supported by the impact of the ECB's monetary policy measures, solid economic growth and the low opportunity cost of holding the most liquid instruments in an environment of very low interest rates. Although the annual growth rate of M1, including the most liquid components of M3, moderated further to 7.0% in April (from 7.5% in March), it continued to contribute significantly to broad money growth.

Chart 19

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 April 2018.

[4] See, for example, the article entitled "The transmission of the ECB's recent non-standard monetary policy measures", *Economic Bulletin*, Issue 7, ECB, 2015.

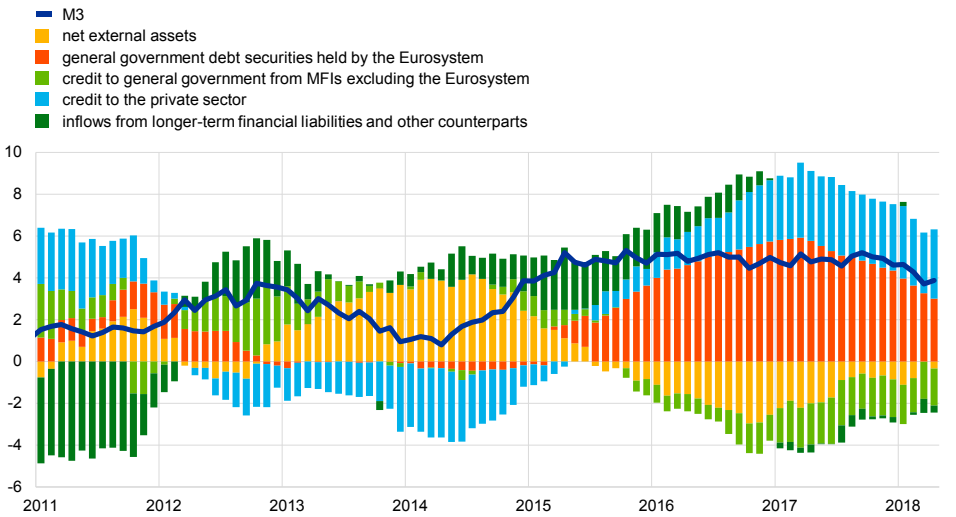
Overnight deposits continued to be the main contributor to M3 growth. Specifically, the annual growth rate of overnight deposits held by households and NFCs remained robust in April (both at 8.4%). By contrast, the more volatile annual growth rate of overnight deposits held by non-monetary financial institutions continued to moderate. The annual growth rate of currency in circulation remained contained, thereby indicating no tendency on the part of the money-holding sector to substitute deposits with cash in an environment of very low or negative interest rates. Short-term deposits other than overnight deposits (i.e. M2 minus M1) continued to have a negative impact on M3. The annual rate of change of marketable instruments (i.e. M3 minus M2) – a small component of M3 – was again negative in April. This development was mainly driven by the negative contribution of money market fund shares/units, reflecting the current low attractiveness of these instruments in terms of remuneration.

Domestic sources of money creation remained the main driver of broad money growth (see Chart 20). From a counterpart perspective, the positive contribution to M3 growth from general government securities held by the Eurosystem decreased further (see the red parts of the bars in Chart 20), in the context of a decline in monthly net purchases under the asset purchase programme. This decrease was broadly offset by an increase in the contribution of credit to the private sector (see the blue parts of the bars in Chart 20), which 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 provision of credit through the Eurosystem's purchases of non-MFI debt securities under the corporate sector purchase programme. The persistent contraction in MFIs' longer-term financial liabilities (excluding capital and reserves) held by non-MFI euro area residents contributed positively to M3 growth (included alongside other counterparts in the dark green parts of the bars in Chart 20). This development is related to funding substituted against the background of more attractive TLTRO funds and Eurosystem covered bond purchases as part of the third covered bond purchase programme. Government bond sales from euro area MFIs excluding the Eurosystem contributed to the negative annual growth of credit to general government from MFIs excluding the Eurosystem and thus dampened M3 growth (see the light green parts of the bars in Chart 20). Finally, the annual flow of MFIs' net external assets was broadly zero, reflecting fewer sales of government bonds by non-euro area residents (see the yellow parts of the bars in Chart 20).

Chart 20

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. The latest observation is for April 2018.

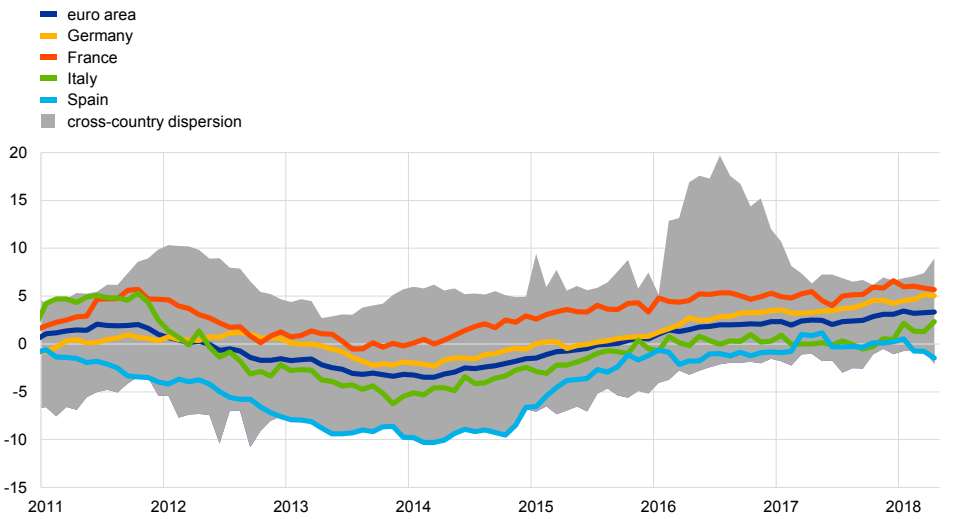
The annual growth rate of loans to the private sector remained on a path of moderate expansion. The annual growth rate of MFI loans to the private sector (adjusted for loan sales, securitisation and notional cash pooling) stood at 3.1% in April (compared with 3.0% in March; see Chart 19). Across sectors, the annual growth rate of loans to NFCs remained stable at 3.3% in April, having recovered significantly from the low level seen in the first quarter of 2014 (see Chart 21). The increase in NFC lending, although moderate, is supported by very favourable financing conditions and robust growth in business investment. The annual growth rate of loans to households remained unchanged at 2.9% in April (see Chart 22). This is fostered by very favourable financing conditions, improvements in labour markets, strengthened housing markets and growth in both residential investment and private consumption. At the same time, overall loan growth remained heterogeneous across countries. In addition, banks have made progress in consolidating their balance sheets, improving profitability and reducing non-performing loans, although the level of such loans remains high in some countries and may continue to affect banks' intermediation capacity.[5]

[5] See also Section 3 of *Financial Stability Review*, ECB, May 2018.

Chart 21

MFI loans to NFCs in selected euro area countries

(annual percentage changes)

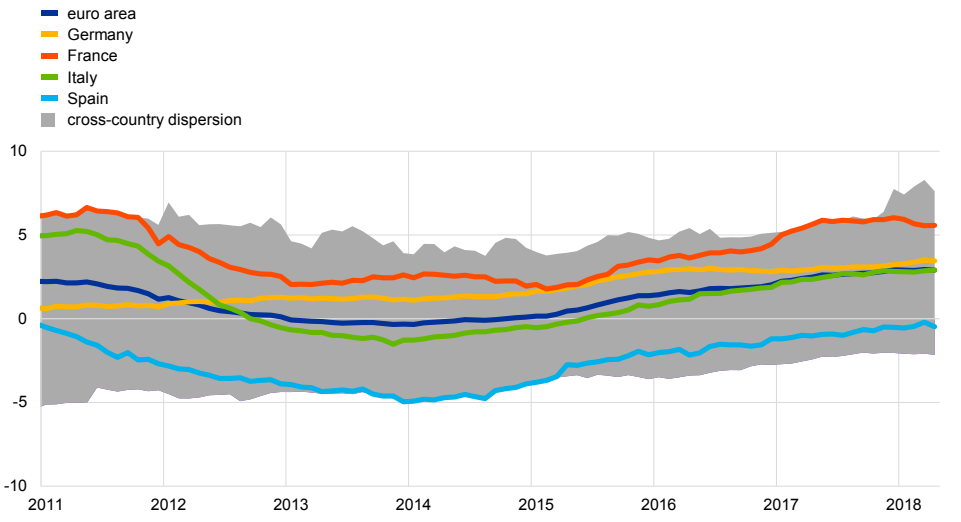


Source: ECB.
Notes: Adjusted for loan sales, securitisation and notional cash pooling. The cross-country dispersion is calculated on the basis of minimum and maximum values using a fixed sample of 12 euro area countries. The latest observation is for April 2018.

Chart 22

MFI loans to households in selected euro area countries

(annual percentage changes)



Source: ECB.
Notes: Adjusted for loan sales and securitisation. 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 April 2018.

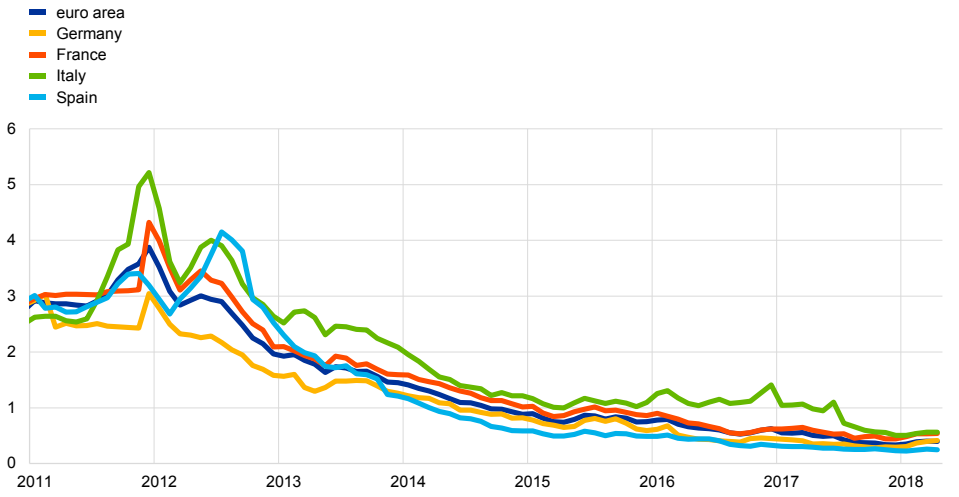
Banks' funding conditions remained close to the historically low levels seen in December 2017. Euro area banks' composite cost of debt financing remained broadly unchanged in April, following an increase in the first quarter of 2018 (see Chart 23). This development was due to an increase in bank bond yields while banks' cost of deposit funding remained broadly stable. The ECB's accommodative monetary policy stance, the net redemption of MFIs' longer-term financial liabilities, and the strengthening of bank balance sheets have all contributed to favourable

bank funding conditions. At the same time, bank bond yields became more heterogeneous across countries in May 2018, against the background of political uncertainty in Italy (see Section 2).

Chart 23

Banks' composite cost of debt financing

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



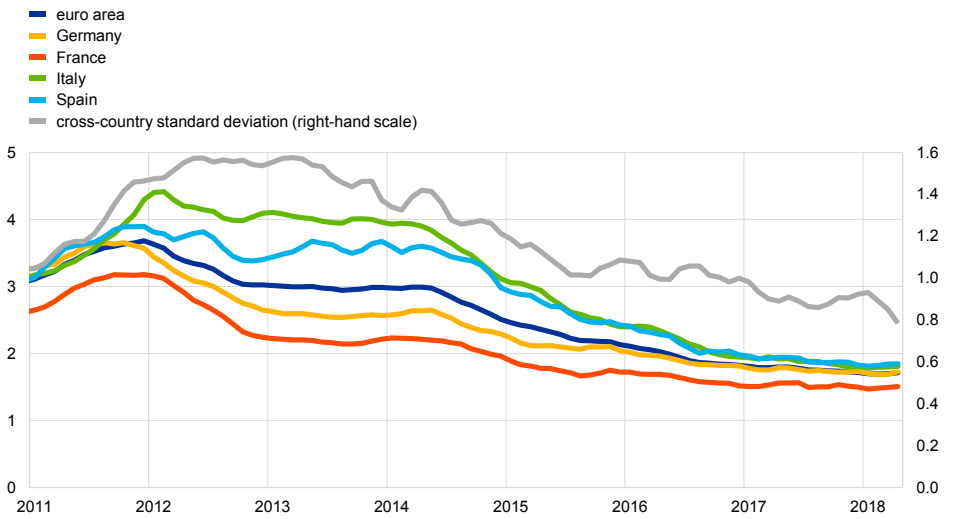
Sources: ECB, Markit Iboxx and ECB calculations.
Notes: The composite cost of deposits is calculated as an average of new business rates on overnight deposits, deposits with an agreed maturity and deposits redeemable at notice, weighted by their corresponding outstanding amounts. The latest observation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

Bank lending rates for NFCs and households remained close to their historical lows. The composite bank lending rate for NFCs (see Chart 24) stood at 1.70% in April, close to the historical low of 1.67% seen in January 2018. Composite bank lending rates for loans to households for house purchase (see Chart 25) remained broadly unchanged at 1.83%, only slightly above the historical low of 1.78% observed in December 2016. Overall, composite bank lending rates for loans to NFCs and households have decreased by significantly more than market reference rates since the ECB's credit easing measures were announced in June 2014. This signals an improvement in the pass-through of monetary policy measures to bank lending rates. The decrease in banks' composite funding costs, mentioned above, has supported the decline in composite lending rates. Between May 2014 and April 2018, composite lending rates on loans to NFCs and loans to households for house purchase fell by 123 basis points and 108 basis points respectively. The reduction in bank lending rates on NFC loans was particularly strong in the euro area countries that were most affected by the financial crisis, leading to a more homogeneous transmission of monetary policy to such rates across countries. Over the same period, the spread between interest rates charged on very small loans (loans of up to €0.25 million) and those charged on large loans (loans of above €1 million) in the euro area narrowed considerably. This indicates that small and medium-sized enterprises have generally benefited to a greater extent from the decline in bank lending rates than large companies.

Chart 24

Composite lending rates for NFCs

(percentages per annum; three-month moving averages)

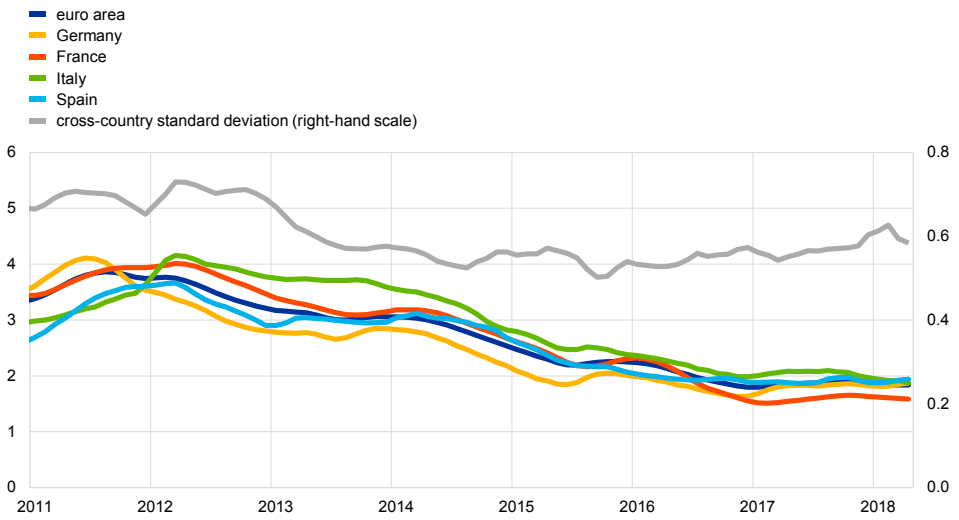


Source: ECB.
Notes: The indicator for the total cost of bank borrowing is calculated by aggregating short and long-term rates using a 24-month moving average of new business volumes. The cross-country standard deviation is calculated using a fixed sample of 12 euro area countries. The latest observation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

Chart 25

Composite lending rates to households 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 April 2018.

The annual flow of total external financing to euro area NFCs is estimated to have moderated somewhat in the first quarter of 2018. This reflects a decline in the issuance of debt securities and listed shares over the course of 2017. By contrast, bank lending dynamics have improved, supported, inter alia, by the continued easing of credit standards and a decline in the cost of bank lending. Overall, the recovery in NFCs' external financing, observed since early 2014, has

been supported by the strengthening of economic activity, the pass-through of the monetary policy measures put in place (thus improving borrowing conditions) and financing requirements related to the larger numbers of mergers and acquisitions. At the same time, NFCs' high retained earnings have reduced the need for external financing.

Net issuance of debt securities by NFCs increased significantly in the first quarter of 2018. Net issuance was robust in January, but moderated in February and March, nonetheless still recording the highest volume since the third quarter of 2016. Market data for April and May suggest that issuance activity remained strong, but at lower levels than those recorded in the first quarter. Net issuance of listed shares by NFCs also increased significantly in the first quarter of 2018.

NFCs' cost of financing has returned to the favourable levels recorded at the beginning of the year. In April, the overall nominal cost of external financing for NFCs, comprising bank lending, debt issuance in the market and equity finance, stood at 4.5%, down by around 14 basis points from March. In May, the cost of financing is estimated to have remained constant. While the current cost of external financing is around 43 basis points above the historic low of July 2016, it remains lower than the level seen in mid-2014 when market expectations of the introduction of the public sector purchase programme began to emerge.

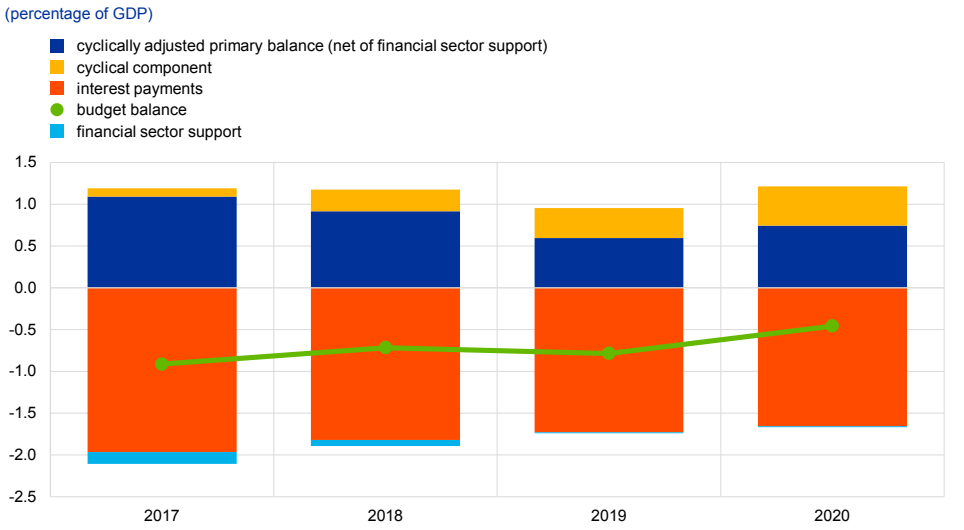
According to the latest Survey on the Access to Finance of Enterprises**, SMEs in the euro area continued to signal further improvements in the availability of external sources of finance. They attributed these improvements mainly to banks being more willing to extend credit.** SMEs indicated that all of the macroeconomic and firm-related factors examined in the survey had had a positive impact on the availability of external finance, reporting no major changes from the last survey. They again ranked access to finance as their lowest concern, although significant cross-country differences still exist. The percentage of distressed SMEs in the euro area has remained at the low level of around 4% since 2015 – significantly below the levels in the region of 15% seen in and around 2012. This is due in part to the accommodative standard and non-standard monetary policy measures in place. On balance, a somewhat smaller share of SMEs reported an increase in turnover and a smaller net percentage indicated a rise in profits in the context of growing labour costs and other costs (for material, energy and interest expenses).

6 Fiscal developments

The euro area budget deficit is projected to decline further over the projection horizon (2018-20), mainly as a result of favourable cyclical conditions and declining interest payments. The aggregate fiscal stance for the euro area is expected to be mildly expansionary in 2018 and broadly neutral in 2019-20. Although the euro area government debt-to-GDP ratio will continue to decline, it will remain elevated. In particular the countries with high debt levels would benefit from additional consolidation efforts to set their public debt ratio firmly on a downward path.

The euro area general government budget deficit is projected to decline further over the projection horizon (2018-20). Based on the June 2018 Eurosystem staff macroeconomic projections,[6] the general government deficit ratio for the euro area is expected to fall from 0.9% of GDP in 2017 to 0.5% of GDP in 2020. The improvement in the fiscal outlook is still mainly driven by favourable cyclical developments and declining interest payments, while the cyclically adjusted primary balance is projected to deteriorate somewhat in 2019 (see Chart 26). The outlook for the euro area general government deficit is slightly more favourable compared with the March 2018 projections.

Chart 26
Budget balance and its components



Sources: ECB and June 2018 Eurosystem staff macroeconomic projections.
Notes: The data refer to the aggregate general government sector of the euro area.

The euro area fiscal stance is projected to be mildly expansionary in 2018 and broadly neutral in 2019-20.[7] The expansionary fiscal stance in 2018 is due to some

6 See the "June 2018 Eurosystem staff macroeconomic projections for the euro area", ECB, 2018. The fiscal projections are based on the no-policy assumption. Thus, the projections only include measures that have already been adopted or are close to being adopted by the respective parliaments.

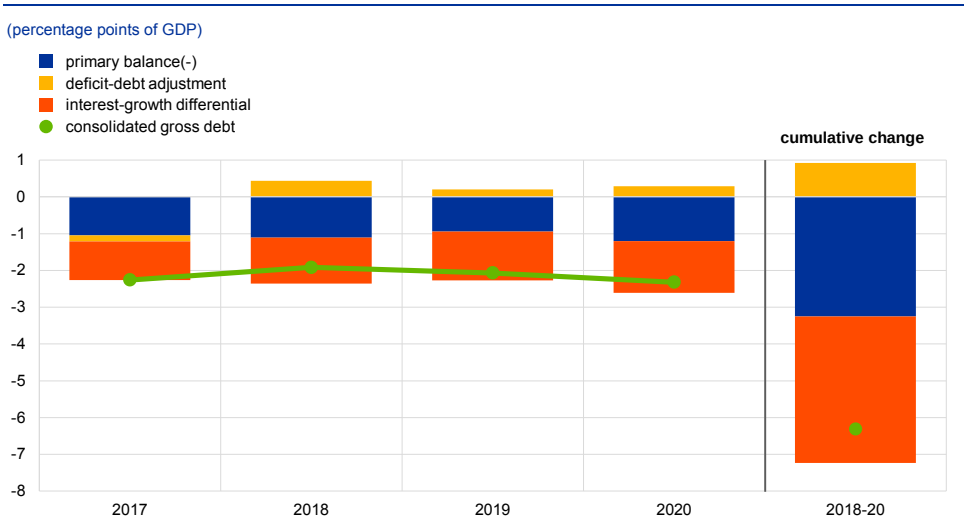
7 The fiscal stance reflects the direction and size of the stimulus from fiscal policies on the economy, beyond the automatic reaction of public finances to the business cycle. It is measured as the change in the structural primary balance, i.e. the cyclically adjusted primary balance ratio net of government support to the financial sector.

minor tax cuts and to growth in government spending being more dynamic than trend nominal GDP. Expansionary policies are in place in the majority of euro area countries. In 2019-20 partly sizeable cuts in taxes and social security contributions are projected to be largely offset by more subdued growth in structural primary spending, namely due to lower social payments and compensation of employees. By contrast, government investment is expected to rebound, slightly exceeding trend nominal GDP over the course of the projection horizon.

The decline in the euro area aggregate public debt-to-GDP ratio is projected to continue. According to the June 2018 Eurosystem staff macroeconomic projections, the aggregate general government debt-to-GDP ratio in the euro area is expected to decline from 86.7% of GDP in 2017 to 80.4% of GDP by the end of 2020. The projected reduction in government debt is supported mainly by favourable developments in the interest rate-growth rate differential and primary surpluses (see Chart 27). Deficit-debt adjustments are, however, expected to contribute somewhat to debt accumulation. Compared with the March 2018 projections, the decline in the aggregate euro area debt-to-GDP ratio is expected to be slightly more subdued, mainly due to less favourable interest rate-growth rate differentials. The debt outlook is projected to improve in most euro area countries; in a few countries, however, debt levels will continue to far exceed the reference value of 60% of GDP. In the medium to long run, ageing-related costs are projected to pose a challenge to fiscal sustainability, with additional upside risks to be expected should previous reforms in the areas of pensions, health care and long-term care be reversed. For an assessment of the 2018 Ageing Report projections see Box 4 entitled “The 2018 Ageing Report – population ageing poses tough fiscal challenges” in this issue of the Economic Bulletin.

Chart 27

Drivers of change in public debt



Sources: ECB and June 2018 Eurosystem staff macroeconomic projections.
Notes: The data refer to the aggregate general government sector of the euro area.

Countries need to continue their fiscal efforts in full compliance with the Stability and Growth Pact. In particular for high debt countries, further

consolidation efforts are essential to set the public debt ratio firmly on a downward path, as their high debt levels render them particularly vulnerable in the event of any future downturns or renewed financial market instability. On 23 May the European Commission released its country-specific recommendations for economic and fiscal policies for EU Member States, with the exception of Greece. For an assessment, see Box 5 entitled “Country-specific recommendations for fiscal policies under the 2018 European Semester” in this issue of the Economic Bulletin.

Boxes

1 Liquidity conditions and monetary policy operations in the period from 31 January to 2 May 2018

Prepared by Riccardo Costantini

This box describes the ECB's monetary policy operations during the first and second reserve maintenance periods of 2018, which ran from 31 January to 13 March 2018 and from 14 March to 2 May 2018 respectively. During this period the interest rates on the main refinancing operations (MROs), the marginal lending facility and the deposit facility remained unchanged at 0.00%, 0.25% and -0.40% respectively.

During the review period, the Eurosystem continued to purchase public sector securities, covered bonds, asset-backed securities and corporate sector securities as part of its asset purchase programme (APP), with a target of €30 billion of purchases on average per month. The purchases will continue at this pace until 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.

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 €1,362.6 billion, an increase of €90.3 billion compared with the previous review period (i.e. the seventh and eighth maintenance periods of 2017). This increase in liquidity needs was attributable to an increase in average net autonomous factors, which rose by €89.4 billion to €1,238.5 billion during the review period, while minimum reserve requirements increased by €0.9 billion to €124.2 billion.

The growth in net autonomous factors, which implies absorption of liquidity, resulted from a decrease in liquidity-providing factors and an increase in liquidity-absorbing ones. The decline in liquidity-providing factors was due in particular to average net foreign assets denominated in euro, which fell by €38.9 billion to €212.8 billion. This resulted from higher Eurosystem liabilities to non-euro area residents which increased on average by €33.4 billion in the period under review, thus providing a negative contribution to average net foreign assets

denominated in euro.[8] On the liability side, the most relevant increase related to government deposits, which increased on average by €39.2 billion to €227.5 billion.

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

Table A

Eurosystem liquidity conditions

Liabilities – liquidity needs (averages; EUR billions)

	31 January to 2 May 2018		1 November 2017 to 30 January 2018	Second maintenance period		First maintenance period	
Autonomous liquidity factors	**2,080.1**	**(+44.3)**	**2,035.9**	**2,102.8**	**(+49.5)**	**2,053.2**	**(+12.5)**
Banknotes in circulation	1,154.1	(+2.1)	1,151.9	1,159.0	(+10.9)	1,148.2	(-10.0)
Government deposits	227.5	(+39.2)	188.3	247.5	(+44.0)	203.6	(+15.5)
Other autonomous factors	698.6	(+3.0)	695.6	696.2	(-5.3)	701.5	(+7.0)
Current accounts	**1,304.6**	**(+10.8)**	**1,293.7**	**1,295.3**	**(-20.3)**	**1,315.6**	**(+40.5)**
Monetary policy instruments	**800.5**	**(-8.3)**	**808.8**	**792.4**	**(-17.7)**	**810.2**	**(-2.8)**
Minimum reserve requirements[1]	124.2	(+0.9)	123.3	124.4	(+0.5)	123.9	(+0.1)
Deposit facility	676.4	(-9.2)	685.6	668.0	(-18.3)	686.3	(-2.9)
Liquidity-absorbing fine-tuning operations	0.0	(+0.0)	0.0	0.0	(+0.0)	0.0	(+0.0)

8 Eurosystem liabilities to non-euro area residents mainly consist of foreign central bank accounts within the Eurosystem. Quarter-ends, and to a lesser extent month-ends, are typically affected by increases in these deposits, as commercial banks are more reluctant to accept cash, either unsecured or secured, ahead of balance sheet reporting dates. For example, on 29 March 2018 liabilities to non-euro area residents denominated in euro increased by €55.8 billion to €339.8 billion.

Assets – liquidity supply (averages; EUR billions)

	31 January to 2 May 2018		1 November 2017 to 30 January 2018	Second maintenance period		First maintenance period	
Autonomous liquidity factors	**841.7**	**(-45.1)**	**886.8**	**828.1**	**(-29.6)**	**857.8**	**(+14.2)**
Net foreign assets	628.9	(-6.2)	635.0	627.1	(-3.8)	630.9	(-4.7)
Net assets denominated in euro	212.8	(-38.9)	251.8	201.0	(-25.8)	226.8	(+18.9)
Monetary policy instruments	**3,219.8**	**(+91.0)**	**3,128.8**	**3,238.4**	**(+40.8)**	**3,197.6**	**(+35.8)**
Open market operations	3,219.7	(+91.1)	3,128.6	3,238.3	(+40.7)	3,197.6	(+35.9)
Tender operations	761.7	(-3.5)	765.2	761.5	(-0.6)	762.1	(-1.5)
MROs	1.7	(-1.2)	2.9	1.9	(+0.4)	1.5	(-1.3)
Three-month LTROs	7.7	(-0.1)	7.8	7.7	(-0.1)	7.7	(-0.0)
TLTRO-I operations	13.0	(-1.8)	14.9	12.7	(-0.7)	13.4	(+0.0)
TLTRO-II operations	739.3	(-0.3)	739.6	739.2	(-0.2)	739.4	(-0.1)
Outright portfolios	2,458.0	(+94.6)	2,363.4	2,476.8	(+41.3)	2,435.5	(+37.3)
First covered bond purchase programme	5.8	(-0.3)	6.1	5.6	(-0.3)	6.0	(-0.1)
Second covered bond purchase programme	4.5	(-0.3)	4.8	4.4	(-0.2)	4.6	(-0.2)
Third covered bond purchase programme	248.8	(+8.3)	240.5	250.6	(+3.8)	246.8	(+4.3)
Securities Markets Programme	85.0	(-4.0)	89.0	84.9	(-0.1)	85.1	(-4.0)
Asset-backed securities purchase programme	25.8	(+0.7)	25.1	26.2	(+1.0)	25.2	(+0.1)
Public sector purchase programme	1,942.3	(+74.5)	1,867.8	1,955.6	(+29.1)	1,926.5	(+29.3)
Corporate sector purchase programme	145.7	(+15.6)	130.1	149.4	(+8.1)	141.3	(+7.9)
Marginal lending facility	0.1	(-0.1)	0.2	0.1	(+0.1)	0.0	(-0.1)

Other liquidity-based information (averages; EUR billions)

	31 January to 2 May 2018		1 November 2017 to 30 January 2018	Second maintenance period		First maintenance period	
Aggregate liquidity needs	1,362.6	(+90.3)	1,272.3	1,399.0	(+79.7)	1,319.3	(-2.0)
Autonomous factors[2]	1,238.5	(+89.4)	1,149.1	1,274.6	(+79.2)	1,195.4	(-2.1)
Excess liquidity	1,856.7	(+0.9)	1,855.8	1,838.8	(-39.2)	1,878.0	(+37.6)

Interest rate developments (averages; percentages)

	31 January to 2 May 2018		1 November 2017 to 30 January 2018	Second maintenance period		First maintenance period	
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	-0.364	(-0.013)	-0.351	-0.364	(-0.000)	-0.364	(-0.005)

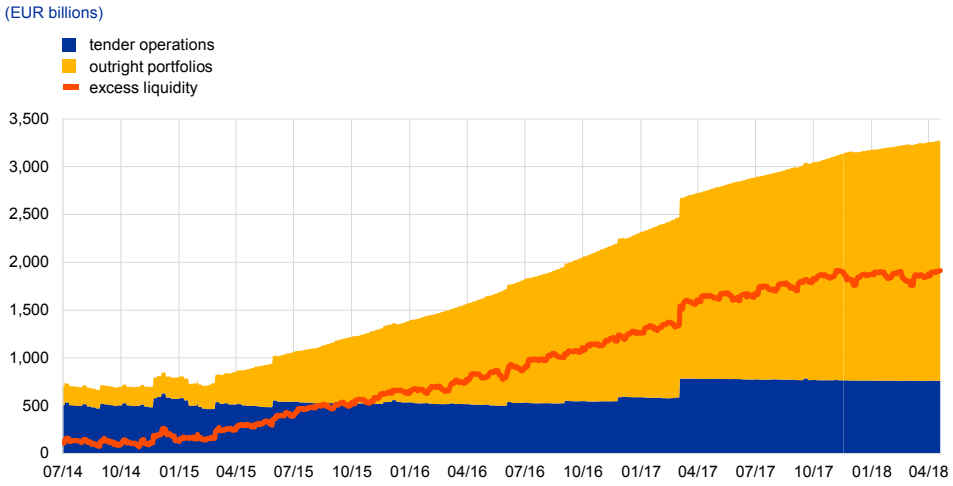
Source: ECB.
Notes: All figures in the table are rounded to the nearest €0.1 billion.
1) Minimum reserve requirements are a memo item that does not appear in the Eurosystem balance sheet and should therefore not be included in the calculation of the total liabilities.
2) This overall value of autonomous 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 €91.0 billion to €3,219.8 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 €3.5 billion to €761.7 billion. This decrease was primarily due to a lower average outstanding amount of targeted longer-term refinancing operations (TLTROs), which decreased by €2.1 billion. The decline in outstanding TLTRO funds was related to the settlement of the voluntary repayments of the third, fifth and seventh operations of the TLTRO-I series in March 2018. The average liquidity provided through MROs decreased by €1.2 billion and the average amount of liquidity provided through three-month longer-term refinancing operations (LTROs) fell by €0.1 billion.

Liquidity provided through the Eurosystem's monetary policy portfolios increased by €94.8 billion to €2,458 billion on average, on the back of the APP purchases. Liquidity provided by the public sector purchase programme, the third covered bond purchase programme, the asset-backed securities purchase programme and the corporate sector purchase programme rose on average by €74.5 billion, €8.3 billion, €0.7 billion and €15.6 billion respectively. The reduction in liquidity resulting from redemptions of bonds held under the Securities Markets Programme and the previous two covered bond purchase programmes totalled €4.6 billion.

Excess liquidity

As a consequence of the developments detailed above, average excess liquidity remained broadly stable in the period under review, increasing only marginally, compared with the previous period, by €0.9 billion to €1,856.7 billion (see Chart A). The increase in liquidity through the APP was almost entirely offset by an increase in autonomous factors, mainly in the second maintenance period. In fact, while excess liquidity grew by €37.6 billion in the first maintenance period, it declined by €39.2 billion in the second maintenance period.

With a view to the allocation of excess liquidity holdings between current accounts and the deposit facility, average current account holdings grew by €10.8 billion to €1,304.6 billion, while the average recourse to the deposit facility declined by a further €9.2 billion to €676.4 billion.

Interest rate developments

Overnight money market rates remained close to the deposit facility rate, or slightly below it for specific collateral baskets in the secured segments. In the unsecured market, the euro overnight index average (EONIA) averaged -0.364%, compared with an average of -0.351% in the previous review period. EONIA fluctuated between a low of -0.370% at the end of February 2018 and a high of -0.348% on the last day of March 2018. In the secured market, average overnight repo rates in the general collateral (GC) Pooling market[9] remained stable for both the standard collateral basket and the extended collateral basket relative to the previous review period. The average overnight repo rate stood at -0.448% for the standard collateral basket while the average overnight repo rate for the extended collateral basket was -0.415%.

The March 2018 quarter-end decline in core repo rates was less pronounced compared with the end of the first quarter of 2017 and was widely perceived as a non-event. For example, at the end of March 2017 overnight GC repo rates on French collateral declined by 12 basis points to -0.54% while German collateral declined by 34 basis points to -0.78%. At the end of March 2018 the same figures declined by only 4 basis points and 6 basis points to -0.46% and -0.47% respectively. This suggests that market participants have adopted more efficient practices for collateral management. Moreover, this development also suggests positive effects from the public sector purchase programme securities lending facility.

9 The GC Pooling market allows repurchase agreements to be traded on the Eurex platform against standardised baskets of collateral.

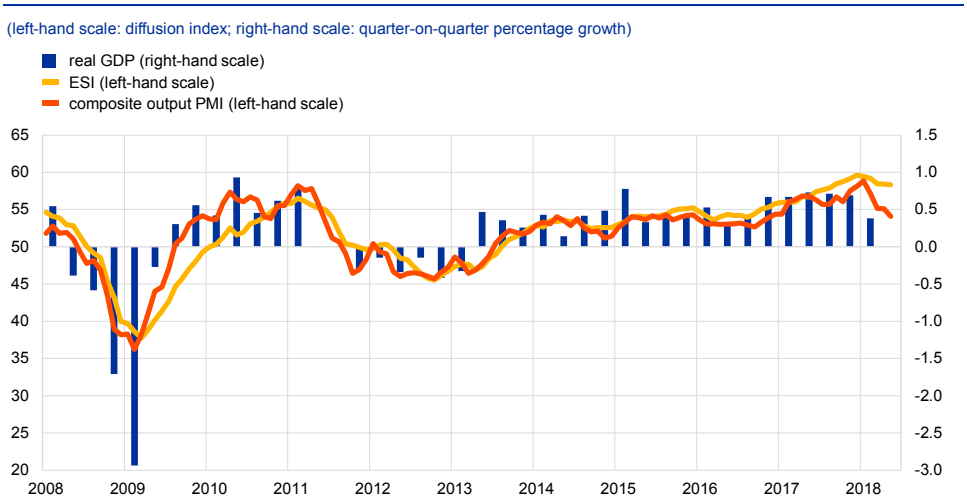
2 The recent slowdown in euro area output growth reflects both cyclical and temporary factors

Prepared by Gonzalo Camba-Mendez and Magnus Forsells

Following very strong growth rates in 2017, quarterly real GDP growth in the euro area moderated to 0.4% in the first quarter of 2018. The slowdown in growth at the start of the year, which appears to reflect temporary factors as well as more lasting cyclical factors, was in line with developments in economic indicators, notably survey data (see Chart A). Both the composite output Purchasing Managers' Index (PMI) and the European Commission's Economic Sentiment Indicator (ESI) declined throughout the first quarter of 2018. However, it is important to note that, like output growth, these indicators fell back from exceptionally high levels.

Chart A

Euro area real GDP, the Economic Sentiment Indicator and the composite output Purchasing Managers' Index

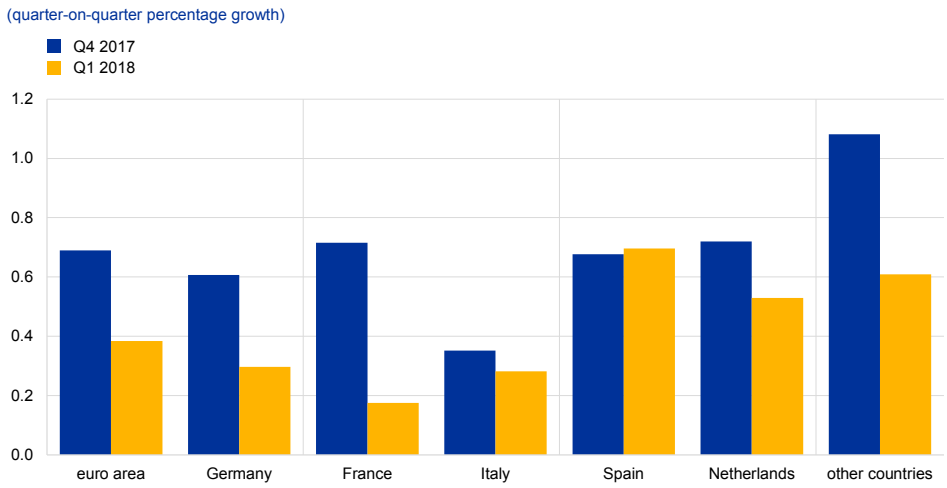


Sources: Eurostat, European Commission, Markit and ECB.
Notes: The ESI is standardised and rescaled to have the same mean and standard deviation as the PMI. The PMI covers manufacturing and services, whereas the ESI also covers the construction and retail trade sectors as well as consumer confidence. The latest observations are for the first quarter of 2018 for real GDP and May 2018 for the ESI and the PMI.

The moderation in growth in the first quarter was relatively broad-based, mainly reflecting lower exports. The slowdown in growth between the last quarter of 2017 and the first quarter of 2018 was broad-based across most euro area countries (see Chart B). Of the largest euro area countries, the only exceptions were Spain and Italy, where growth rates remained broadly stable between the two quarters. Looking at the euro area expenditure breakdown, the slowdown in growth reflects lower export growth and, to a lesser extent, lower investment growth. While the slowdown in investment growth was driven by developments in a few countries, the lower growth in exports was broad-based (see Chart C).

Chart B

Real GDP in the euro area



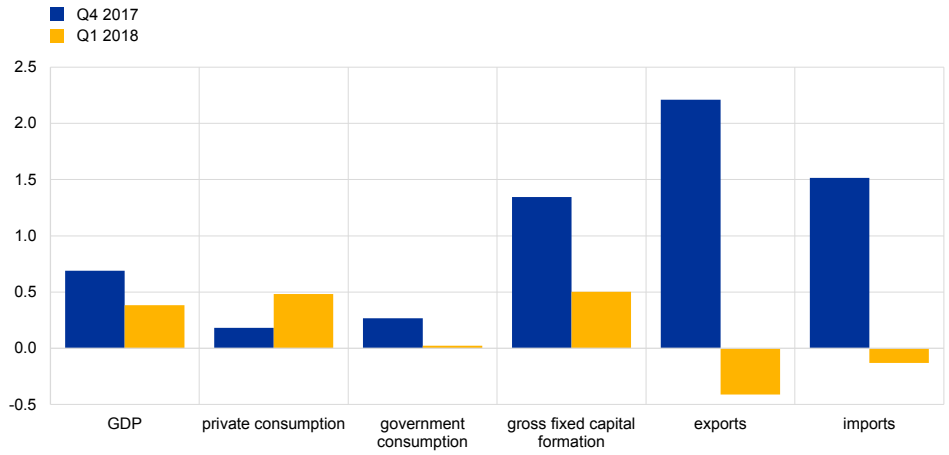
Sources: Eurostat and ECB calculations.
Note: GDP for the first quarter of 2018 is not yet available for Ireland and Luxembourg.

The slowdown in growth at the start of the year appears to partly reflect temporary factors. Temporary effects are likely to have played a role in the weakness of the recent economic data releases. For example, high levels of sick-leave due to the unusually virulent influenza season in countries like Germany hampered growth. Meanwhile, cold winter weather conditions and industrial strikes in some euro area countries may also account for some of the weakness in the retail and construction sectors.

However, factors of a more lasting cyclical nature may have also played a role in the decline in growth. First, some of the slowdown in GDP growth may have been associated with increasing supply-side constraints in some countries. Second, indicators of global trade growth point to a modest deceleration in the first months of this year. This probably reflects a temporary decline in foreign demand and lagged effects of the euro appreciation in 2017, but it cannot be excluded that part of this decline was also driven by a deterioration in expectations resulting from the ongoing tariff discussions. Third, the moderation in growth in industrial production excluding construction was broad-based across euro area countries, and there are some signs of weakness in the early industrial production data releases for the second quarter of 2018. Fourth, there is growing evidence that the automotive sector may have reached its peak. This is partly confirmed by new passenger car registrations, which seem to have plateaued following a steady increase since the beginning of 2013. Furthermore, the decline in growth may have been compounded by an increase in uncertainty.

Chart C

Composition of euro area real GDP



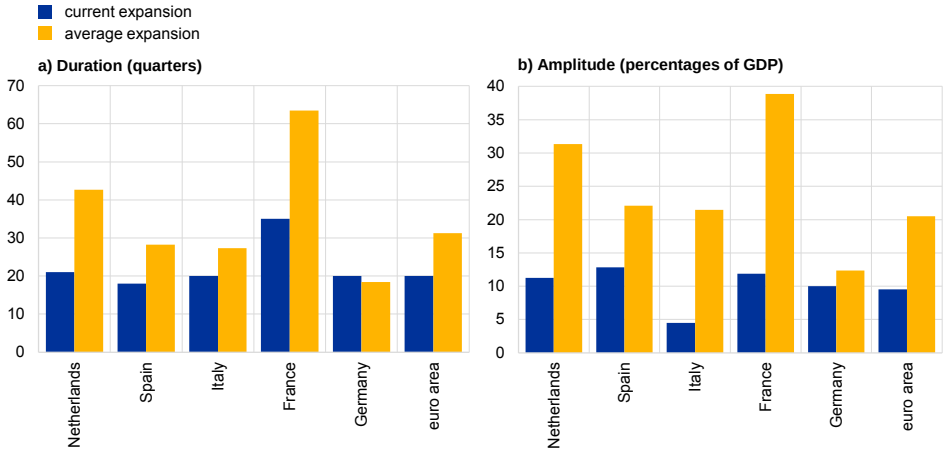
Source: Eurostat.

However, from a long-term perspective, the ongoing recovery is by no means exceptional in terms of length or strength. The duration of the current expansion, which began in 2013, is still below the historical average for most euro area economies (see Chart D, left-hand panel). The amplitude (percentage gain in GDP relative to the trough) during the ongoing expansion is also low by historical standards. There is also, in principle, scope for further employment growth, as the unemployment rate remains elevated in some euro area countries. Nonetheless, consumer confidence in the euro area remains close to record highs, partly on account of reduced job insecurity. Furthermore, euro area real investment remains below its pre-crisis level. Business investment has only recently recovered to levels similar to those recorded prior to the financial crisis, and public investment remains subdued.

Chart D

Euro area real GDP: characteristics of the current expansion from a historical perspective (trough-to-peak)

(quarters; percentages of GDP)



Sources: OECD, Eurostat, CEPR and ECB calculations.
Notes: Expansion is the phase of the business cycle where the economy is moving from a trough to a peak. The chronology of expansions for the euro area comes from the Centre for Economic Policy Research (CEPR). For the five big euro area countries, it is calculated using quarterly real GDP and the Bry-Boschan algorithm. The blue bars correspond to the current expansion and the yellow bars to the average duration or amplitude of expansions in each country since 1970. The current expansion began in the first quarter of 2013 for the euro area, Germany and Italy, the fourth quarter of 2012 for the Netherlands, the third quarter of 2013 for Spain, and the second quarter of 2009 for France, and extends to the most recent GDP observation (first quarter of 2018).

Overall, the economic expansion should remain solid, supported by the underlying strength of the euro area economy. Although survey results have again moderated somewhat, they remain consistent with further solid growth. Going forward, the solid growth is expected to continue, albeit possibly at lower rates, as the ECB's monetary policy measures continue to underpin domestic demand. Private consumption should continue to be supported by employment gains and rising household wealth. Investment is expected to strengthen further on the back of very favourable financing conditions, rising corporate profitability and solid demand. In addition, the broad-based global expansion is providing impetus to euro area exports.

3 Monitoring the exchange rate pass-through to inflation

Prepared by Elke Hahn and Derry O'Brien

Exchange rate developments can play an important role in shaping the outlook for HICP inflation. As a change in the exchange rate can affect consumer prices with considerable delays and as the impact can depend on the economic situation at the time, assessing the exchange rate pass-through requires constant monitoring. Between April 2017 and May 2018, the exchange rate of the euro appreciated by about 8% in nominal effective terms and by about 10% against the US dollar. This box briefly recalls how exchange rate changes are transmitted to consumer prices in the euro area. The box also looks at indicators at different stages of the pricing chain to gauge the degree of the pass-through at the current juncture. The focus is on the monitoring of the pass-through to exchange rate-sensitive components of the HICP excluding energy and food.

The exchange rate pass-through works through both direct and indirect channels.[10] For instance, the recent appreciation of the euro has a direct effect on HICP inflation through cheaper imported final consumer goods, which are part of the HICP basket. The direct effect applies for example to cheaper imports of refined oil, which entail a strong dampening impact on the HICP energy component. In addition, there can be an indirect effect as cheaper imported inputs impact domestic producer prices to the extent that these cost decreases are not absorbed by profit margins. An even more indirect effect occurs if the exchange rate appreciation dampens overall price pressures through its adverse impact on net trade and hence overall demand and output. In addition, there may be repercussions on inflation via inflation expectations. While the HICP excluding energy and food is subject to the direct channel, the indirect effects may be even more relevant for this HICP component. Overall, various factors determine the exchange rate pass-through. These factors include the share of imported final goods and services in the price index, the importance of imported inputs (in particular, of commodities) in domestic production, product characteristics such as the degree of product differentiation, and the intensity of competition in the market. These factors can also lead to variations in the magnitude and timing of the pass-through across HICP components. The response of prices following a change in the exchange rate may, moreover, depend on the underlying drivers of the exchange rate movement.[11]

Of the components making up the HICP excluding energy and food, non-energy industrial goods (NEIG) prices are the most sensitive to movements in the exchange rate. This is due in particular to the durable goods component (see Chart A), although there is also a high degree of heterogeneity in the exchange rate responsiveness of the prices within that component. Until exchange rate impacts become visible in these different consumer goods categories,

[10] See also the article entitled "Exchange rate pass-through into euro area inflation", *Economic Bulletin*, ECB, Issue 7, 2016.

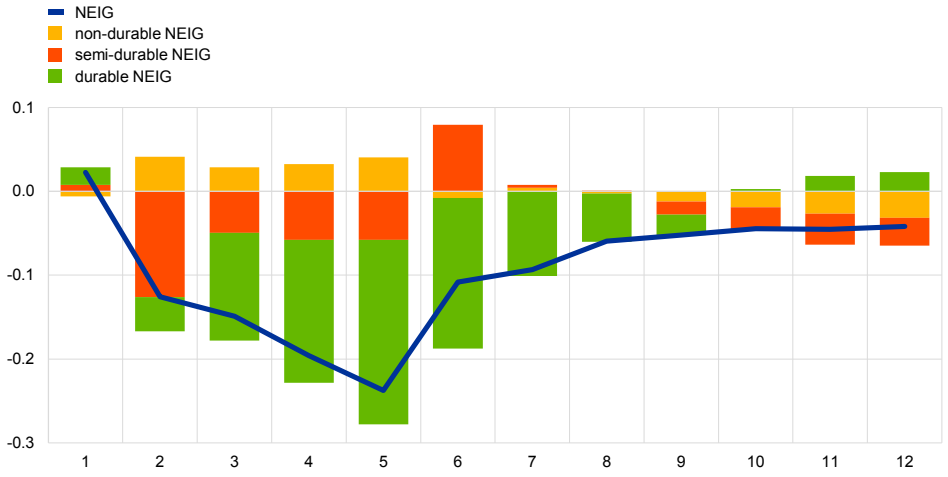
[11] For more details on the underlying drivers of the exchange rate movement, see Box 3 of the article "September 2017 ECB staff macroeconomic projections for the euro area", ECB, 2017.

a series of short-term indicators can be affected along the production and pricing chains and provide relevant signals.

Chart A

Estimated impact of a 10% appreciation of the nominal effective exchange rate of the euro on NEIG inflation

(annual percentage change, percentage point contribution)



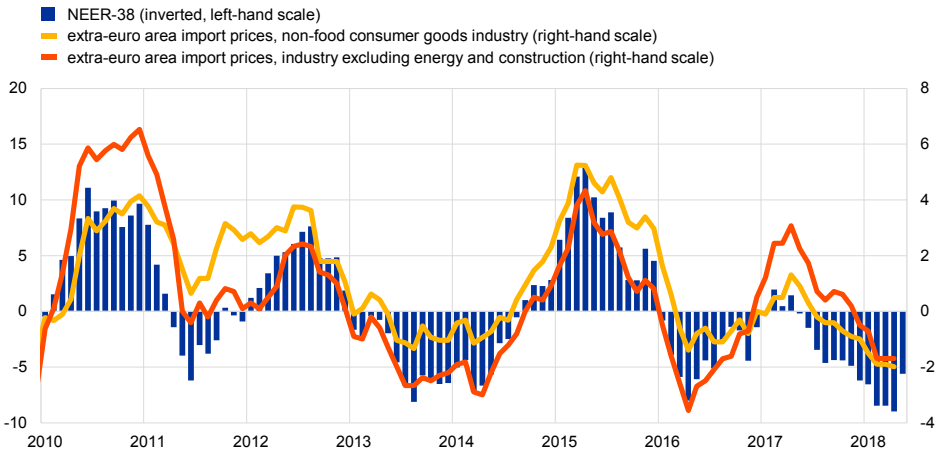
Sources: Eurostat and ECB calculations.
Notes: The x-axis refers to the quarters following a change in the exchange rate. Estimates are derived from an amended and updated version of the VAR model presented in Hahn, E., "Pass-through of external shocks to euro area inflation", Working Paper Series, No 243, ECB, July 2003.

The impact of the past euro exchange rate appreciation has been clearly visible in import price developments. Extra-euro area import prices for non-food consumer goods declined in annual terms from 1.3% in April 2017 to -2.0% in April 2018. These imports account for approximately 12% of final non-energy and non-food goods consumption, with only distribution and retail margins separating their prices from consumer prices. Over the same period, extra-euro area import price inflation for industry (excluding energy and construction), which also affect prices earlier in the domestic production chain, decreased from 3.1% to -1.7% (see Chart B). These declines reflected to a large extent the influence of the appreciation of the euro effective exchange rate.

Chart B

Import prices and nominal effective exchange rate

(annual percentage changes)



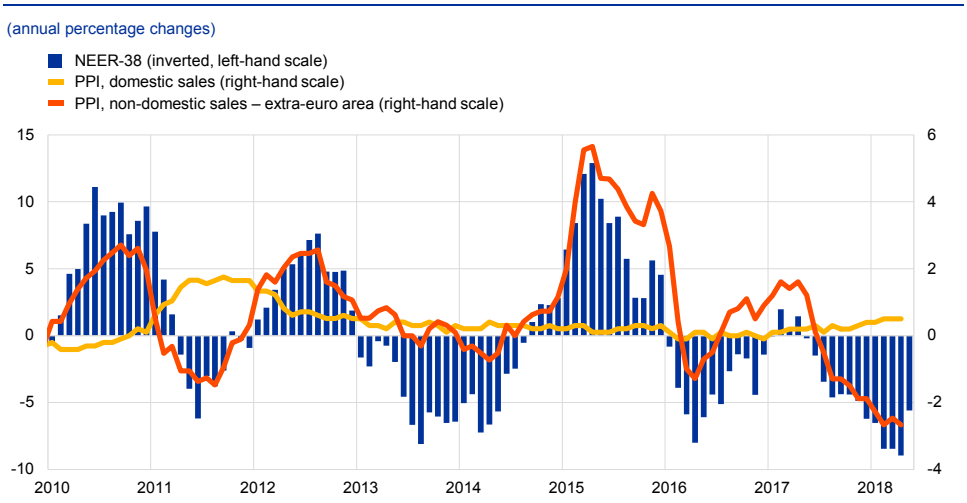
Sources: Eurostat and ECB calculations.
Note: The latest observations are for May 2018 for the nominal effective exchange rate of the euro against 38 of its main trading partners (NEER-38) and April 2018 for the extra-euro area import prices.

In contrast to import price inflation, euro area producer price inflation has remained resilient to downward pressure from the exchange rate appreciation. Producer price inflation for sales[12] of intermediate goods declined only moderately and annual inflation for producer prices of domestic sales of non-food consumer goods increased from 0.2% in April 2017 to 0.5% in April 2018, with much of the increase occurring since the autumn, i.e. at a point in time when the exchange rate would start to have an effect (see Chart C). Producer prices depend on domestic labour and non-labour cost developments, as well as firms' behaviour in adjusting their margins. Notably, labour costs rose; annual growth in compensation per employee in the industrial sector excluding construction increased from 1.4% in the first quarter of 2017 to 2.0% in the final quarter of 2017. At the same time, there may have been some increase in pricing power, as suggested by a steady rise to record highs in capacity utilisation in the non-food consumer goods sector. Together, these factors may as yet have offset the downward pressure from the exchange rate.

12 The headline series for euro area producer price index is an aggregate of the series for domestic sales within the individual euro area countries. This abstracts from the sales of one euro area country to another, which from an area-wide perspective can also be considered as domestic sales. Producer price inflation for non-food consumer goods of these intra-euro area sales declined from 0.2% in April 2017 to -0.9% in March 2018. These account for about 28% of the total non-food consumer goods produced and sold in the euro area.

Chart C

Producer price index (PPI) for domestic and extra-euro area sales of non-food consumer goods



Sources: Eurostat and ECB calculations.
Note: The latest observations are for May 2018 for the nominal effective exchange rate of the euro against 38 of its main trading partners (NEER-38) and April 2018 for the producer price index (PPI).

The appreciation of the euro exchange rate can also be expected to affect domestic price pressures via profits of domestic firms, albeit with a somewhat ambiguous overall sign. Producer price inflation of non-food consumer goods for sales in markets outside the euro area fell sharply from 1.6% in April 2017 to -2.7% in April 2018 (see Chart C). This points to some pricing-to-market behaviour of euro area firms in export markets, possibly to mitigate losses in market shares that would otherwise have occurred through the exchange rate appreciation. This behaviour may have squeezed the overall profits of euro area firms. However, this effect may be smaller or even overcompensated given the large decline in import price inflation, as the rest of the world did not fully absorb the euro exchange rate movement. In this regard, firms may in effect cross-subsidise lower revenues in foreign markets by choosing to not pass on lower costs to other firms or consumers in a robust domestic market. The net effect on profits will also depend on the relative size of the exporting sector and the degree to which imports are used as inputs for firms or final products for retailers.

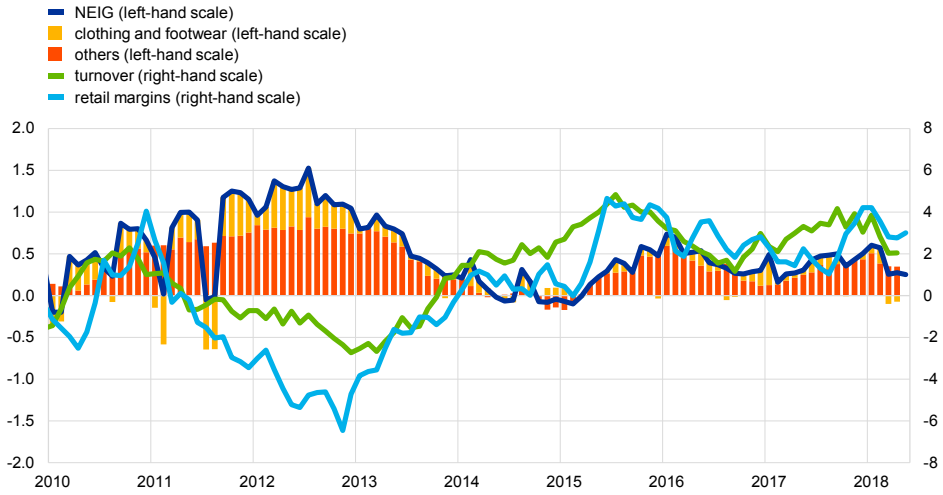
The latest decline in NEIG inflation does not provide a clear sign for significant effects of the exchange rate appreciation. NEIG inflation edged upwards between April 2017 and late 2017 despite the strong deceleration of inflation for imported non-food consumer goods (see Chart D). It did so at a point when pass-through models, such as are presented in Chart A, would have predicted the onset of the downward impact of the euro exchange rate appreciation. Counterbalancing domestic demand forces may have played a role. These were evidenced by strong growth in the volume of retail trade turnover for non-food consumer goods and in the elevated margins in the non-food retail sector as shown in the Purchasing Managers' Index survey. The decline in NEIG inflation in recent months was due partly to strong volatility in, for example, the annual rates of inflation for the clothing and footwear sub-component, which likely reflected the impact of changing seasonal sales

patterns. Thus far, NEIG inflation has remained somewhat resilient to the downward pressure of the euro exchange rate appreciation, which may reflect the influence of counteracting domestic forces.

Chart D

NEIG inflation and retail margins and turnover

(annual percentage changes, percentage points and diffusion index)



Sources: Eurostat, ECB calculations and Markit.
Note: The latest observations are for May 2018 for retail margins and NEIG HICP (flash estimate) and April 2018 for NEIG components and turnover.

To conclude, monitoring the impact of the past euro exchange rate appreciation on the inflation outlook is an ongoing exercise. First, pass-through models suggest that the impacts are spread out over several quarters, so that the appreciation from mid-2017 might still be relevant for some quarters to come. Second, the exchange rate pass-through may be difficult to detect if it is offset by a confluence of other factors, including increased pricing power for firms. In this regard, continued monitoring and assessing of NEIG prices and their indicators along the pricing chain is warranted.

4 The 2018 Ageing Report: population ageing poses tough fiscal challenges

Prepared by Carolin Nerlich

This box presents the main projection results of the 2018 Ageing Report for euro area countries. The 2018 Ageing Report, published on 25 May 2018, is the latest of the reports prepared every three years by the Ageing Working Group of the Economic Policy Committee.[13] The report provides long-term projections of total public age-related costs and their components, which comprise pensions, health care, long-term care, education expenditure and unemployment benefits, for all EU countries over the period 2016-70. These projections are, of course, dependent on the underlying assumptions.[14]

The euro area population is ageing. The old-age dependency ratio in the euro area, i.e. the number of people aged 65 or older relative to the working age population, is projected by Eurostat to rise by 20 percentage points between 2016 and 2070, reaching 52% in 2070. If not addressed through decisive policy action, population ageing could have adverse implications for the public debt trajectory and potential growth.[15]

According to the 2018 Ageing Report, total public ageing costs in the euro area are projected to increase by 1.1 percentage points of GDP over the projection horizon (2016-70), rising from 26% of GDP in 2016 to 28.2% of GDP in 2040, before declining again to 27.1% of GDP in 2070. The report shows that ageing costs in the euro area will peak in the early 2040s with the baby boomer generation in retirement, and partly decline from 2050 onwards.[16] Ageing cost estimates differ substantially across countries, and this variance is expected to increase towards the end of the projection horizon. By 2070, ageing costs are projected to be highest in Belgium, Luxembourg, Austria and Finland, reaching levels above 30% of GDP, compared to around 15% of GDP in Latvia and Lithuania (Chart A). Over the projection horizon, ageing costs are expected to increase in 11 countries, remain broadly unchanged in four countries and decline in four countries. The most notable increases are projected for Luxembourg, followed by Malta, Slovenia and Belgium, while the most significant declines are projected for Greece and France (Chart B).

13 See "The 2018 Ageing Report: Economic & Budgetary Projections for the 28 EU Member States (2016-2070)", European Commission, May 2018.

14 The Ageing Report projections are based on a set of demographic and macroeconomic assumptions and a commonly agreed methodology. These were published in a separate report entitled "2018 Ageing Report: Underlying Assumptions & Projection Methodologies", European Commission, November 2017. As discussed later, for a number of countries, these underlying assumptions are rather favourable.

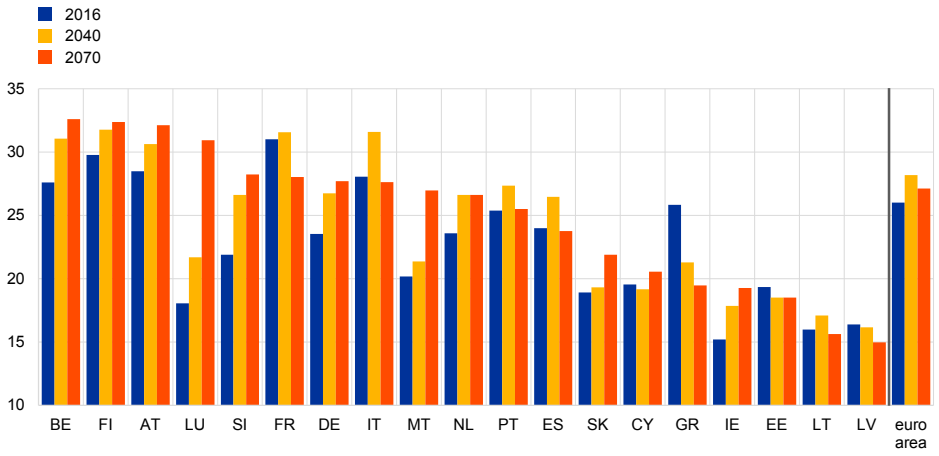
15 For an analysis of ageing cost-related challenges and the role of pension reform, see the article entitled "The economic impact of population ageing and pension reforms", *Economic Bulletin*, Issue 2, ECB, 2018.

16 Compared with the previous Ageing Report from 2015, total public ageing costs in the euro area are projected to increase by 0.6 percentage point more between 2016 and 2060, which was the end-date of the previous projections. However, the projected ageing-cost level in 2060 remains almost unchanged at 27.6% of GDP, owing to the downward revision of the 2016 level.

Chart A

Total public ageing costs

(percentages of GDP; 2016, 2040 and 2070)

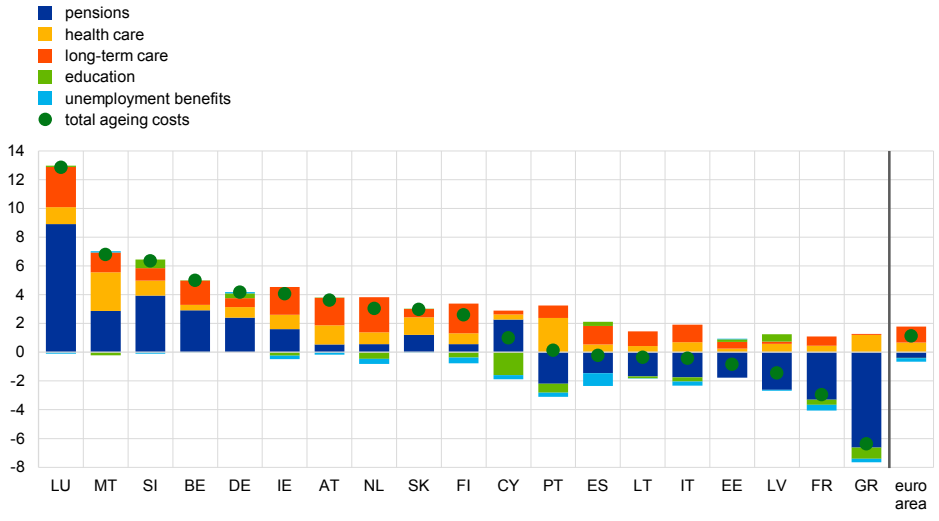


Sources: 2018 Ageing Report and ECB calculations.
Note: Weighted average for the euro area.

Chart B

Changes in total public ageing costs and their components

(percentage points of GDP; 2016-70)



Sources: 2018 Ageing Report and ECB calculations.
Note: Weighted average for the euro area.

The total ageing cost projections are largely influenced by public pension costs, followed by health care and long-term care costs.[17] On average, public pension costs in the euro area are expected to increase by 1.3 percentage points of GDP by 2040, but to decline by 0.4 percentage point of GDP over the whole projection horizon to 11.9% of GDP in 2070. There is, however, significant heterogeneity across countries. Public pension costs are the most important driver of

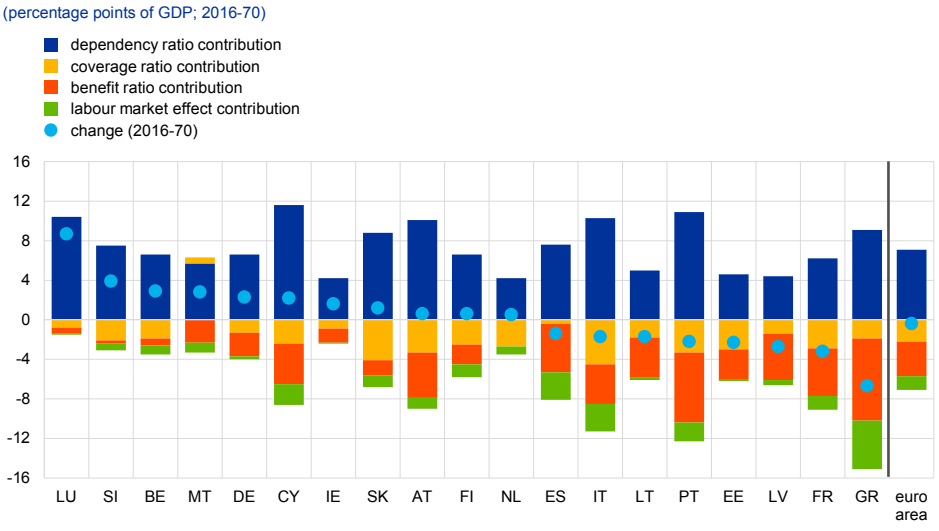
[17] In 2016 almost half of the total ageing costs consisted of pension expenditure (45%), with lower shares for health care (27%), education (18%), long-term care (6%) and unemployment benefits (3%).

increasing ageing costs in Belgium, Luxembourg, Slovenia, Germany, Malta and Cyprus, while they contribute significantly to the decline in ageing costs in Greece and France. By contrast, in all countries, health care and long-term care costs contribute positively to the change in total ageing costs, despite large cross-country heterogeneity (Chart B).

Public pension cost dynamics are driven by opposing factors. On the one hand, the rise in the old-age dependency ratio due to population ageing is expected to increase pension cost pressures in all countries. On the other hand, this impact is expected to be compensated by projected declines in other factors, namely (i) the benefit ratio, (ii) the coverage ratio, and (iii) the labour market effect (Chart C). The decline in the benefit ratio (i.e. pension benefits relative to wages) reflects past reforms that reduce the accumulation of pension benefits, but also relatively favourable assumptions regarding labour and total factor productivity via their impact on wages. The coverage ratio (i.e. the number of pensioners relative to the number of people aged 65 or older) is projected to decline in almost all countries, mainly due to measures restricting access to early retirement and raising the statutory retirement age. Finally, the labour market effect (i.e. the impact on pension costs of labour market changes affecting employment, working time and the old-age participation rate) is projected to decline owing to the impact of reforms (e.g. encouraging longer working careers) and the assumption that the unemployment rate converges to a lower structural rate in the long run. Overall, the projected pension cost developments are the result not only of past reform efforts but also of partly favourable underlying assumptions.

Chart C

Drivers of pension cost projections



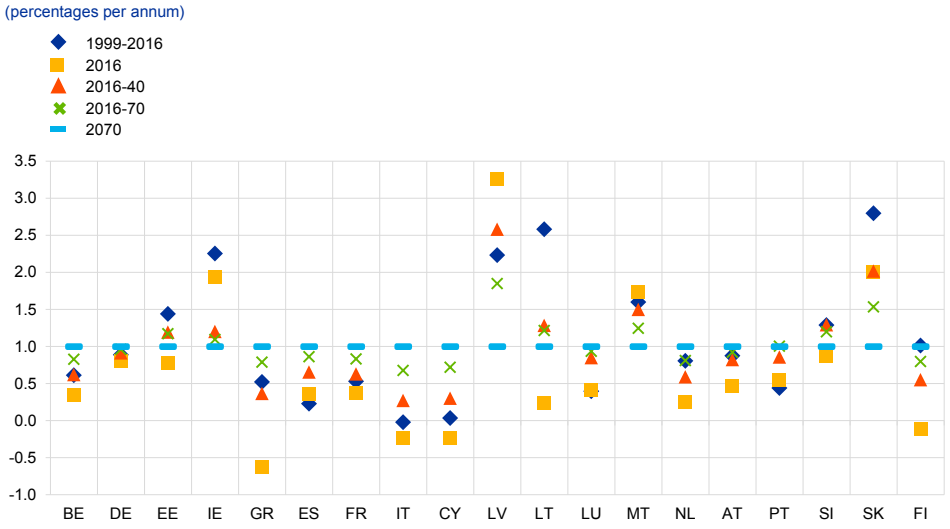
Sources: 2018 Ageing Report and ECB calculations.
Note: Weighted average for the euro area.

The Ageing Report projections are exposed to substantial adverse risks arising from the favourable underlying assumptions. If the underlying demographic and macroeconomic assumptions do not materialise as expected, this would result in substantially higher ageing costs. Total factor productivity is assumed

to converge to a growth rate of 1% per year in the long run in all countries, which implies a strong improvement for the majority of countries relative to current values (Chart D). In addition, structural unemployment is projected to decline to an average rate of 6.8% in the long run, from 10.2% in 2016. While the projections are made under the "no policy change" assumption, it is, however, very unlikely that it would be possible to achieve significantly higher productivity and lower structural unemployment rates without major structural reforms. Moreover, for several countries, Eurostat's population projections seem optimistic when compared to projections by national authorities or the United Nations.

Chart D

Total factor productivity: past, current and projected growth rates



Sources: 2018 Ageing Report, European Commission and ECB calculations.

Further risks relate to the reversal of enacted reforms. The report assumes that all pension reforms legislated in recent years will be fully implemented. However, in some countries (e.g. Italy and Spain), there seems to be a high risk that previously adopted pension reforms will be reversed. Moreover, the risk of reform reversals could rise for countries currently projecting major declines in pension benefit ratios. Alternatively, in such cases, the risk of continuously rising social assistance transfers could increase if private pension arrangements fail to fill the gaps.

Overall, further reform efforts are needed in a number of countries to curb the expected increase in public ageing costs in an environment of already high public debt levels. Against this background, it will be important that countries take additional decisive policy action and increase their structural reform efforts in the area of pensions, health care and long-term care.

5 Country-specific recommendations for fiscal policies under the 2018 European Semester

Prepared by Stephan Haroutunian, Sebastian Hauptmeier and Nadine Leiner-Killinger

On 23 May the European Commission issued its 2018 European Semester Spring Package of policy recommendations for Member States. The package includes country-specific recommendations (CSRs) for economic and fiscal policies for all EU Member States.[18] It also covers recommendations regarding the implementation of the European Union's Stability and Growth Pact (SGP) for a number of countries.[19] With regard to fiscal policies, the recommendations focus in particular on Member States' compliance with the SGP on the basis of the Commission's 2018 spring forecast and the Commission's assessment of countries' policy plans as reflected in the updates of the stability and convergence programmes released in April. This year's European Semester exercise is important particularly with a view to avoiding any repetition of mistakes made prior to the financial crisis when sufficient fiscal buffers were not built up in economic good times and the ensuing recession was aggravated by the sudden necessity of pro-cyclical fiscal tightening. Against this background, this box examines the fiscal policy recommendations that are addressed to 18 euro area countries (i.e. excluding Greece).

The Spring Package points to improved budgetary positions in euro area countries, but also to considerable cross-country divergence, as high government debt ratios still leave some countries vulnerable to shocks. According to the European Commission's 2018 spring forecast, ten euro area countries were at or above their medium-term budgetary objectives (MTOs) or posted underlying budgetary positions in the vicinity of their MTOs in 2017 (see Chart A). This should help reduce government debt ratios and bolster public finances ahead of a possible downturn. At the same time, a number of countries still remain distant from their MTOs, most notably countries with government debt-to-GDP ratios of more than 90% of GDP. High government debt levels render public finances vulnerable to future macroeconomic downturns. They entail the risk that fiscal policies may need to be tightened at times when it would be warranted to let the stabilising properties of fiscal policies operate to support the economy.[20]

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18 Except for Greece, where the monitoring of fiscal performance will continue within the framework of the European Stability Mechanism (ESM) programme throughout its duration (i.e. until August 2018). Greece was therefore exempt from the obligation to submit a medium-term budgetary plan (Stability Programme) and a National Reform Programme in April, and did not receive recommendations.

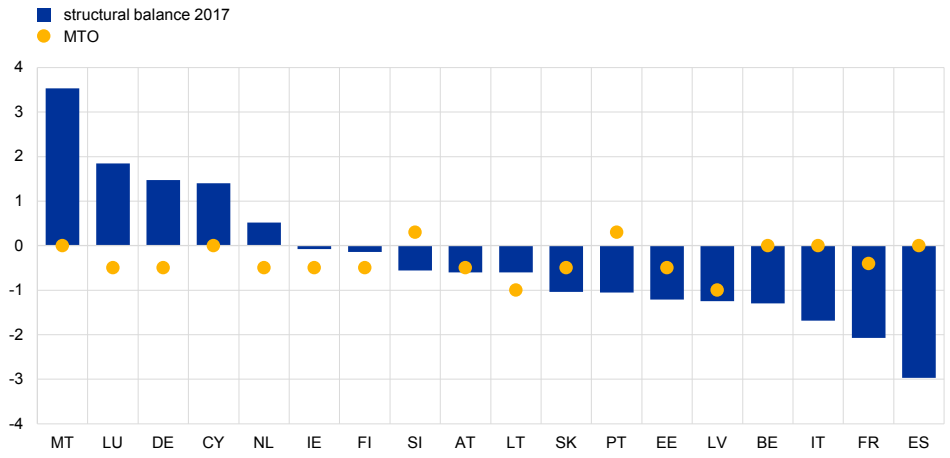
19 The CSRs were finalised and approved by the Member States' economics and finance ministers on 22 June. They are scheduled to be endorsed by the European Council on 28-29 June. The adoption of the CSRs by the Economic and Financial Affairs Council (ECOFIN Council) at the meeting scheduled for 13 July will formally conclude the 2018 European Semester.

20 For an overview of the economic consequences of high government debt, see the article entitled "Government debt reduction strategies in the euro area", *Economic Bulletin*, Issue 3, ECB, 2016.

Chart A

Structural balances in 2017 and MTOs

(percentages of GDP)



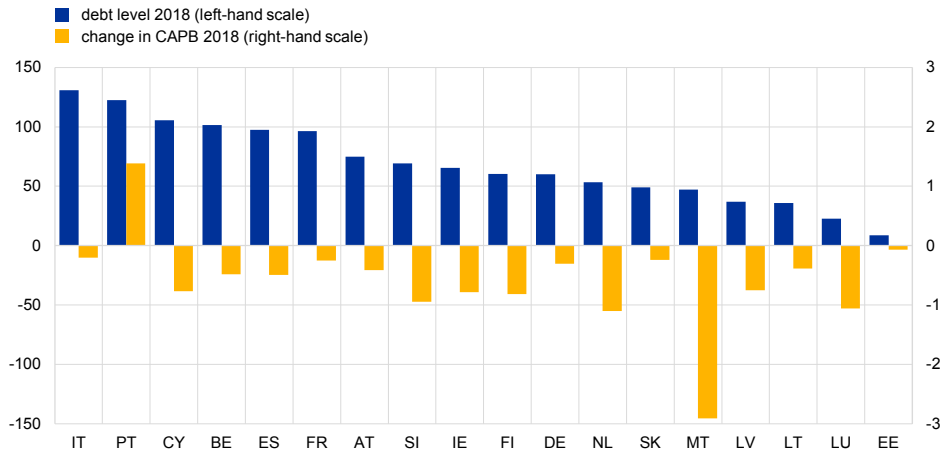
Sources: European Commission (AMECO database) and ECB calculations.
Notes: The chart depicts countries' structural balances in 2017 and their MTOs. According to the Commission's Vade Mecum on the Stability and Growth Pact, countries with a structural balance within the 0.25% of GDP margin of tolerance of the MTO are considered as having achieved their MTO.

Fiscal policies are expected to be expansionary in the vast majority of Member States in 2018, including in countries with high government debt. According to the European Commission's forecast, the fiscal stance as measured by the change in the cyclically adjusted primary balance (CAPB) is expected to be expansionary in almost all euro area countries this year (see Chart B). This reflects the fact that a number of countries that achieved their MTOs in 2017 are expected to spend part of their fiscal surpluses. However, the forecast expansionary stance is also a reflection of fiscal loosening in countries with still high debt ratios and further consolidation needs.

Chart B

Government debt-to-GDP and the fiscal stance: 2018

(left-hand scale: percentages of GDP; right-hand scale: percentage points of GDP)



Sources: European Commission (AMECO database) and ECB calculations.
Note: The fiscal stance is measured as the change in the CAPB.

Indeed, according to the European Commission projections, most of the countries that have not yet reached sound budgetary positions are expected to miss their commitments under the SGP in 2018. Among the seven euro area countries that are assessed by the Commission to be at risk of a significant deviation from the SGP's preventive arm in 2018, four countries – Belgium, France, Italy and Portugal – have debt ratios above 90% of GDP. In addition, while Spain, which is the only country subject to an excessive deficit procedure (EDP) in 2018, is projected to meet its 2018 EDP correction deadline, this achievement masks a significant deterioration in the structural balance, as opposed to the recommended improvement.[21]

While, overall, the CSRs reflect the guiding principle of using good economic times to rebuild buffers, some exceptions from the standard approach are being applied.[22] For Spain and Slovenia, the CSRs foresee structural effort requirements for 2019 below those agreed under the SGP's preventive arm matrix, namely 0.65% of GDP rather than 1% of GDP.[23] The deviation from the matrix requirement is based on economic judgement, notably with reference to high unemployment. The ex post assessment of compliance with the SGP in 2019 will acknowledge a margin of deviation for the outcomes in 2018. This approach follows the "discretionary" lowering of adjustment requirements for two countries in 2018, from 0.6% to 0.3% of GDP for Italy, and from 1% to 0.6% of GDP for Slovenia (see Chart C), in this case without any additional margin of deviation. This application of the SGP comes at the cost of lowering the framework's transparency, consistency and predictability.

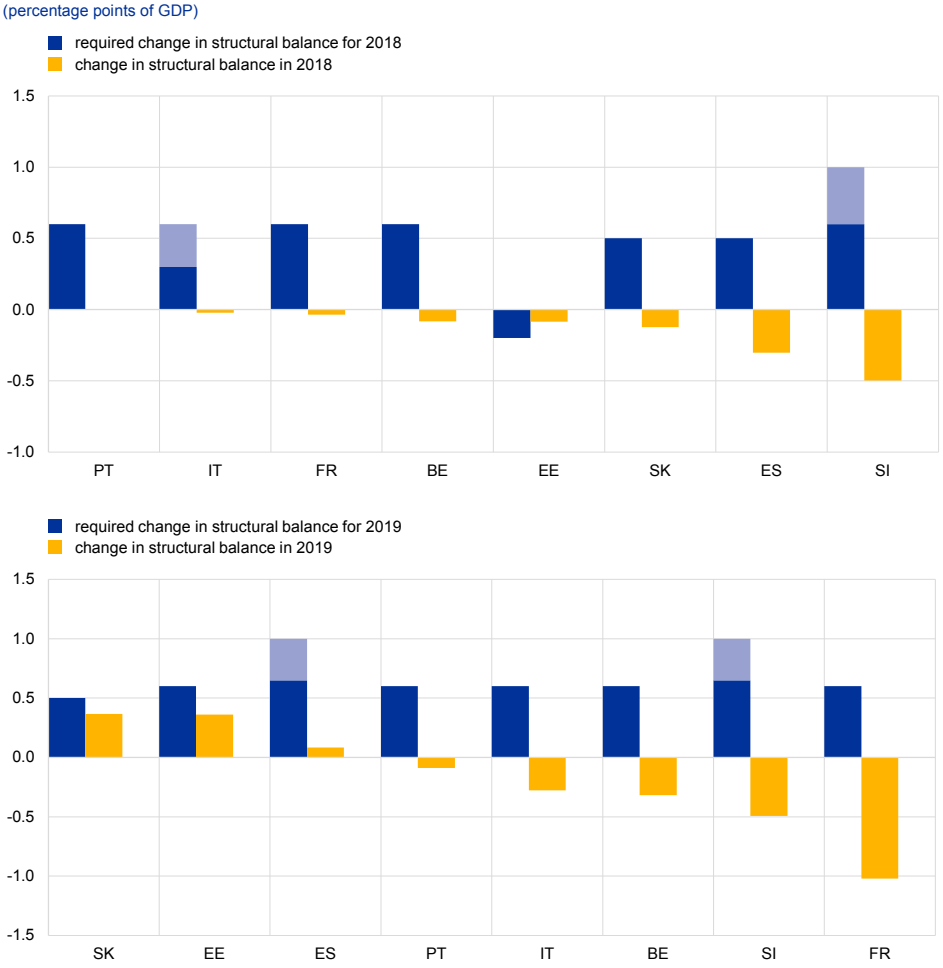
21 According to the Commission's 2018 spring forecast, Spain will miss the EDP's headline deficit target of 2.2% of GDP (by around 0.4 percentage points of GDP) owing to a significant deterioration in the structural balance (by 0.3 percentage points, as opposed to the recommended improvement of 0.5 percentage points).

22 See also Communication from the Commission to the European Parliament, the European Council, the Council, the European Central Bank, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank: 2018 European Semester – Country-specific recommendations, COM(2018) 400 final.

23 This matrix differentiates adjustment needs by the levels of the output gap and government debt. It is based on the principle that favourable economic times and high government debt warrant larger adjustment needs. For an assessment, see the box entitled "Flexibility within the Stability and Growth Pact", *Economic Bulletin*, Issue 1, ECB, 2015.

Chart C

Adjustment requirements under the SGP in 2018 and 2019 for euro area countries not at their MTO in 2017



Sources: European Commission (AMECO database) and ECB calculations.
Notes: The structural effort requirements for the individual years are those enshrined in the CSRs. For 2019 they are quantified in the CSRs for fiscal policies under the 2018 European Semester. The areas shaded light blue within the respective bars reflect the fact that adjustment requirements are lower than those foreseen under the preventive arm matrix. For 2019, the Commission forecast is based on a "no policy change" scenario in the absence of a budget for that year.

The CSRs recommend countries which are at or above their MTOs to make use of the fiscal space to increase potential output. Caution is, however, warranted to the extent that fiscal surpluses also reflect tailwinds from a strong cycle that will reverse in the future. This is why expenditure developments should be monitored carefully.

On 23 May the European Commission also issued recommendations for some euro area countries regarding the implementation of the SGP. The Commission adopted reports for Belgium and Italy under Article 126(3) of the Treaty on the Functioning of the European Union in which it assesses their compliance with the Treaty's debt criterion. In the case of Italy, the Commission concluded that the debt criterion "should be considered as currently complied with" because fiscal policies are found to be broadly compliant with the SGP's preventive arm for 2017. For Belgium, the Commission report concludes that there is no sufficiently robust

evidence to conclude that Belgium did not comply with the preventive arm requirements. It therefore does not fully conclude whether the debt criterion is or is not complied with. In the light of both countries being expected to deviate significantly from the SGP's preventive arm requirements this year, the Commission will reassess their compliance with the fiscal rules on the basis of the ex post data for 2018. However, treating "broad compliance" with the preventive arm as a prime relevant factor, while disregarding gaps in compliance with the debt reduction benchmark, lowers the effectiveness of the debt rule. This entails the risk that high debt will not be reduced sufficiently rapidly.[24] Finally, the Commission recommended abrogating the EDP for France by its 2017 deadline, and the Council adopted a corresponding decision on 22 June.

Recent financial market volatility underlines the need to use the current favourable macroeconomic environment more decisively to create fiscal buffers and reduce high debt. The EU's agreed fiscal rules must therefore be complied with and applied fully and consistently across countries and over time. This is indispensable for trust in the common currency and for progress towards completing Economic and Monetary Union.

[24] For an assessment of the functioning of the SGP's debt rule, see the article entitled "Government debt reduction strategies in the euro area", *Economic Bulletin*, Issue 3, ECB, 2016.

Articles

1 Foreign direct investment and its drivers: a global and EU perspective

Prepared by Federico Carril-Caccia and Elena Pavlova

The relevance of foreign direct investment (FDI) as a source of economic activity has increased rapidly over the last decade. Between 2000 and 2016 the share of FDI stock in global GDP increased from 22% to 35%. Following a decline during the Great Recession, mergers and acquisitions (M&As), the most dynamic component of FDI, have recovered, reaching a record value of USD 1.2 trillion in the first quarter of 2018. The intensification of FDI activity has important implications for both origin and destination countries in terms of, for example, economic growth, productivity, wages and employment. Moreover, the expansion of multinational enterprises (MNEs) has been accompanied by the creation of complex cross-border production chains, which also has important implications.

This article presents several findings regarding the main developments in and determinants of FDI over the past decade, at both global and EU level. Since the beginning of the 2000s there has been a gradual shift in the global FDI landscape, with emerging market economies (EMEs) gaining in prominence both as a source of and as a destination for such investment. EMEs have attracted a growing share of FDI flows, reaching more than 50% of the world's total inward FDI in 2013. In addition, FDI flows are dominated by a relatively small number of M&As. In 2016 M&As with a value in excess of USD 1 billion accounted for only 1% of all FDI projects, but they generated 55% of total FDI flows. Moreover, evidence suggests that FDI and exports are not competing but complementary strategies for serving foreign markets. Finally, since 2008 EU countries are no longer the world's main FDI investors and recipients. Nevertheless, econometric analysis shows that belonging to the EU dramatically boosts FDI flows in member countries.

1 Introduction

The last decade has witnessed a surge in FDI. Between 2000 and 2016, FDI stocks grew from 22% of world GDP to 35%. FDI, which is defined as a situation where a firm owns at least 10% of a company located in a different country,[25] is

[25] See *Balance of Payments and International Investment Position Manual, Sixth Edition (BPM6)*, International Monetary Fund, 2009.

carried out by MNEs, which invest abroad either through greenfield investments (GIs), i.e. the setting-up of subsidiaries abroad, or through M&As.[26]

FDI has the potential to bring several benefits to the recipient country. The arrival of MNEs in a country can foster efficiency through increased competition. It can also produce positive productivity spillovers as MNEs integrate domestic firms into their production processes through forward and backward linkages. In addition, MNEs tend to make new technology available and provide access to new markets, improving the training and qualifications of the local workforce and increasing wages and employment. The extent of these positive outcomes will depend partly on the host country's absorptive capacity.[27] For EU countries, existing evidence confirms the positive impact of FDI.[28]

Traditionally, advanced economies have played a major role as both the source and destination of FDI. Until the beginning of the Great Recession, almost 90% of outward FDI (OFDI) flows came from advanced economies. EU countries were particularly prominent, as their share in world OFDI was nearly 50%. At the same time, the EU and other advanced economies attracted between 60% and 70% of total inward FDI (IFDI) flows.

Since 2008 there has been a dramatic change in the global FDI landscape. OFDI and IFDI from and into EMEs have started to gain in importance. By 2014 EMEs represented 41% and 56% of global OFDI and IFDI respectively, while the EU's share of OFDI and IFDI had shrunk to only 15% and 18% respectively.

This article provides an overview of the main FDI trends and drivers. Section 2 outlines some fundamental developments. Section 3 focuses on determinants of FDI. Section 4 addresses the relationship between FDI and exports, i.e. whether they are complementary or substitutes. Finally, Section 5 analyses the FDI performance of euro area and non-euro area EU countries over time, including the benefits of EU/euro area membership when it comes to attracting IFDI.

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26 GI is motivated by the desire of MNEs to exploit their competitive advantage abroad. This mode of investment is based on pursuing economic activities that are very similar and complementary to those already developed by the parent company. M&As concern the acquisition of at least 10% of the shares in an existing firm. M&As are driven by the following objectives: (i) increasing market share by acquiring competitors; (ii) exploiting synergies between the investing and target companies (e.g. in terms of technology); and (iii) internalising host country-specific assets of the target company (e.g. market share or institutional knowledge). See Davies, R.B., Desbordes, R. and Ray, A., "Greenfield versus Merger & Acquisition FDI: Same Wine, Different Bottles?", *UCD Centre for Economic Research Working Paper Series*, WP15/03, University College Dublin School of Economics, 2015; and Nocke, V. and Yeaple, S.R., "Cross-border mergers and acquisitions vs. greenfield foreign direct investment: The role of firm heterogeneity", *Journal of International Economics*, Vol. 72(2), 2007, pp. 336-365.

27 See Blomström, M. and Kokko, A., "Multinational Corporations and Spillovers", *Journal of Economic Surveys*, Vol. 12(3), 1998, pp. 247-277.

28 See, for example, Ashraf, A., Herzer, D. and Nunnenkamp, P., "The Effects of Greenfield FDI and Cross-border M&As on Total Factor Productivity", *The World Economy*, Vol. 39(11), 2016, pp. 1728-1755; Bertrand, O., "Effects of foreign acquisitions on R&D activity: Evidence from firm-level data for France", *Research Policy*, Vol. 38(6), 2009, pp. 1021-1031; Bloom, N., Sadun, R. and Van Reenen, J., "Americans Do IT Better: US Multinationals and the Productivity Miracle", *American Economic Review*, Vol. 102(1), 2012, pp. 167-201; Dachs, B. and Peters, B., "Innovation, employment growth, and foreign ownership of firms: A European perspective", *Research Policy*, Vol. 43(1), 2014, pp. 214-232; and Girma, S. and Görg, H., "Evaluating the foreign ownership wage premium using a difference-in-differences matching approach", *Journal of International Economics*, Vol. 72(1), 2007, pp. 97-112.

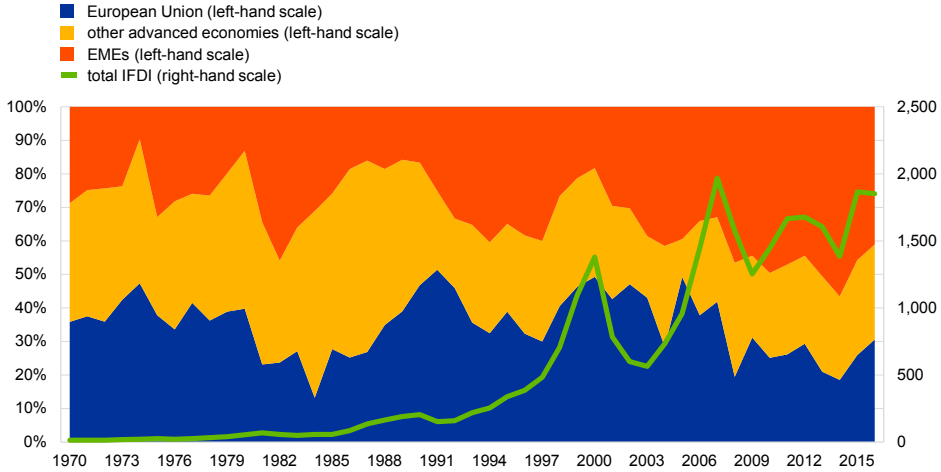
2 Key developments in global FDI

Over the last two decades the global map of inward and outward FDI has changed significantly. FDI has traditionally originated from advanced economies, which were also the main destination (see Chart 1). Since the early 2000s, the importance of EMEs as a destination for FDI has gradually increased. In 2013, for the first time, EMEs attracted more than 50% of global IFDI.[29]

Chart 1

Inward foreign direct investment by destination

(left-hand scale: share of advanced and emerging market economies in world IFDI, percentages; right-hand scale: total IFDI, USD billions)



Source: UNCTAD.

Over the last 16 years, EMEs have also progressively increased in importance as a source of FDI. As illustrated in Chart 2, the share of FDI originating from EMEs started to increase at the beginning of the 2000s. After 2008 the rate of growth of FDI from EMEs accelerated, and in 2014 EMEs accounted for 41% of total OFDI[30].

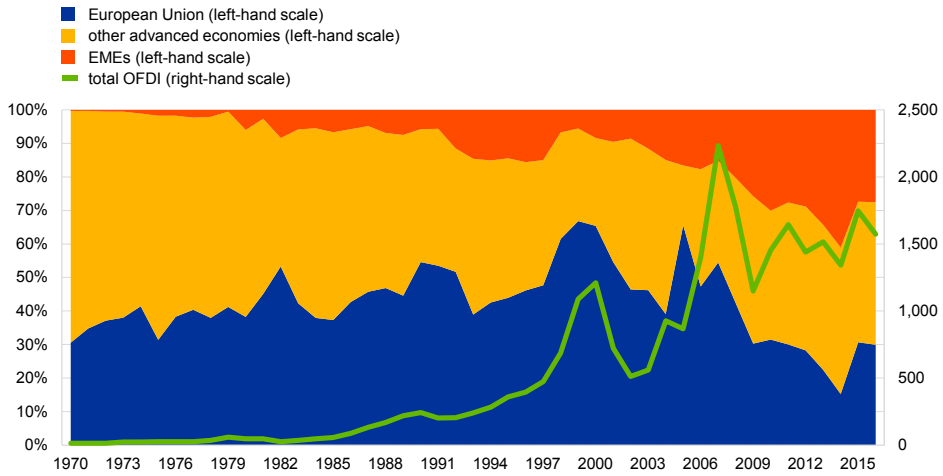
[29] Data on FDI flows in this section are taken from the United Nations Conference on Trade and Development (UNCTAD). The period covered is 1970-2016.

[30] One might expect total IFDI and total OFDI in Charts 1 and 2 to be equal. However, owing to statistical differences, mainly as a consequence of slightly different definitions across countries, there are discrepancies between the two series.

Chart 2

Outward foreign direct investment by origin

(left-hand scale: share of advanced and developing economies in world OFDI, percentages; right-hand scale: total OFDI, USD billions)



Source: UNCTAD.

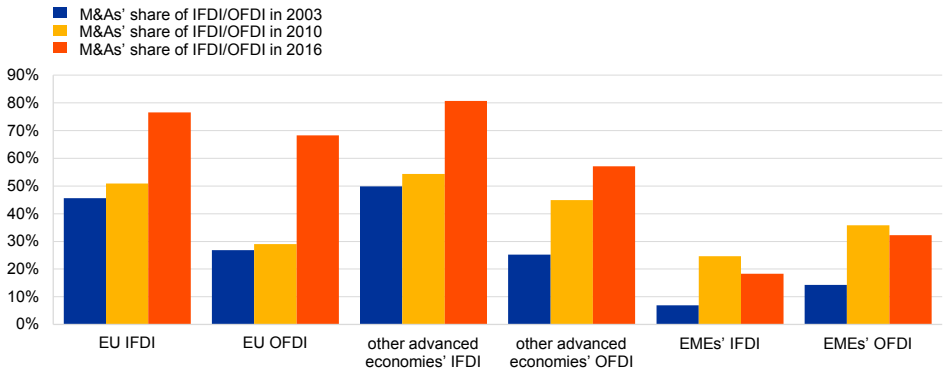
In the EU and other advanced economies, M&As play a prominent role in total IFDI flows. Between 2003 and 2016, an increasing share of IFDI in the EU and other advanced economies was accounted for by M&As.[31] As shown in Chart 3, in both country groups M&As made up around 80% of total IFDI flows in 2016. Although M&As have also increased in importance in EMEs, IFDI in those countries is still dominated by GIs. In 2016 GIs accounted for around 80% of IFDI into EMEs. In the case of OFDI, a similar trend is observed. For the EU and other advanced economies, M&As had become the preferred mode of outward investment by 2016, while for EMEs GIs remained predominant. At the global level, in the period 2003-2016 EMEs provided the destination for 62.7% of total GI and 19.3% of M&A investment. In terms of OFDI, the EU and other advanced economies accounted for 72% of GI and 82.4% of M&A investment.

[31] Owing to limitations in the availability of M&A and GI statistics, we only describe the period 2003-16.

Chart 3

Share of M&As in global IFDI and OFDI, 2003-16

(percentages; share of M&As in total IFDI and OFDI volumes)



Sources: UNCTAD, Thomson Reuters and ECB calculations.
Notes: Inward and outward GI data are taken from UNCTAD. Inward and outward M&A data are taken from Thomson Reuters. Calculations are based on a sample of 94 countries. Total IFDI and OFDI volumes for each year (2003, 2010 and 2016) are calculated as the sums of inward and outward GI and M&A flows respectively.

The services sector has become the main target for foreign acquisitions. The sectoral distribution of IFDI was fairly constant in the period 2003-16. During this period, 70% of international M&As were in the services sector, followed by manufacturing (24%) and the primary sector (6%). In the case of GIs, the distribution between services and manufacturing was more even (50.4% and 48.2% respectively), while the primary sector lagged far behind (1.4%).[32]

3 The structural determinants of FDI

MNEs can engage in FDI activities for a number of strategic reasons (using local platforms to enhance market penetration, absorbing or transferring new technologies, gaining access to resources or control of competitors, reducing production costs, etc.). A firm's internationalisation usually depends on three basic preconditions: (i) high productivity, as only the most productive firms have the capacity to invest abroad; (ii) the existence of firm-specific advantages which are not easily transferable to third parties and are at the core of the firm's output; and (iii) a relatively strong market position in the home country.[33] The determinants of FDI can in turn be grouped in the following way: (i) ownership, which allows a firm to best exploit its competitive advantages abroad; (ii) location, which involves exploiting locational advantages across the globe (e.g. supply of labour or natural resources); and (iii) internalisation, whereby a firm internalises foreign markets for the use or

[32] Statistics are based on the total number of FDI projects (GIs and M&As) that took place during the period 2003-16. Data are taken from UNCTAD (2017), op. cit., annex tables 16 and 23.

[33] See Helpman, E., Melitz, M.J. and Yeaple, S.R., "Export Versus FDI with Heterogeneous Firms", *American Economic Review*, Vol. 94(1), 2004, pp. 300-316; Hymer, S.H., *The International Operations of National Firms: A Study of Direct Foreign Investment*, MIT Press, 1976; and Love, J.H., "Technology sourcing versus technology exploitation: an analysis of US foreign direct investment flows", *Applied Economics*, Vol. 35(15), 2003, pp. 1667-1678.

generation of assets. Accordingly, FDI is driven by four main factors: (i) markets; (ii) assets; (iii) natural resources; and (iv) efficiency seeking.[34]

First, by investing abroad, companies may seek access to promising new markets. From this perspective, inward FDI should tend to be positively correlated with the size of the host country economy and its market potential in terms of economic growth.[35]

Second, asset-seeking FDI is driven by access to new, complementary resources and capabilities. This type of investment is motivated by a firm's desire to improve or expand its existing technologies, managerial skills or labour force. It is often directed towards advanced countries.[36] In the EU, technological progress has been among the main drivers of IFDI.[37] Conversely, in the case of EMEs, a positive correlation between technological intensity and IFDI is not expected.

Third, FDI flows may also be driven by the desire for access to natural resources. This type of FDI is more likely to be directed towards EMEs which have abundant natural resources. However, large natural resource endowments can also deter IFDI into EMEs owing to what is known as the "natural resource curse", i.e. the negative long-term impact of large natural resources on a country's development (e.g. in terms of economic growth, institutional quality or capital allocation), which may hamper its capacity to attract FDI.[38] This outcome, however, is neither universal nor unavoidable, but affects certain countries under certain conditions, such as high dependence of exports and fiscal revenues on resource wealth, low saving rates, highly volatile resource revenues, and crowding-out of other activities.

Fourth, efficiency-seeking FDI is mainly driven by lower labour costs and higher productivity. In the case of labour costs, existing evidence in the literature is far from conclusive.[39] This type of investment is generally expected to be directed towards EMEs with large supplies of cheap labour (e.g. China and Vietnam) for the development of low value added economic activities.[40]

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34 See Dunning, J.H., "The Eclectic Paradigm of International Production: A Restatement and Some Possible Extensions", *Journal of International Business Studies*, Vol. 19(1), 1988, pp. 1-31.

35 See Blonigen, B.A., "A Review of the Empirical Literature on FDI Determinants", *Atlantic Economic Journal*, Vol. 33(4), 2005, pp. 383-403; Davies et al. (2015), op. cit.; and Nielsen, B.B., Asmussen, C.G. and Weatherall, C.D., "The location choice of foreign direct investments: Empirical evidence and methodological challenges", *Journal of World Business*, Vol. 52(1), 2017, pp. 62-82.

36 See Amighini, A.A., Rabellotti, R. and Sanfilippo, M., "Do Chinese state-owned and private enterprises differ in their internationalization strategies?", *China Economic Review*, Vol. 27, 2013, pp. 312-325.

37 See Villaverde, J. and Maza, A., "The determinants of inward foreign direct investment: Evidence from the European regions", *International Business Review*, Vol. 24(2), 2015, pp. 209-223. The authors define technological progress in terms of R&D investment, R&D personnel, the technology intensity of the sector and human capital.

38 See Asiedu, E., "Foreign direct investment, natural resources and institutions", *IGC Working Papers*, International Growth Centre, March 2013.

39 See Nielsen et al. (2017), op. cit.

40 See Buckley, P.J., Clegg, L.J., Cross, A.R., Liu, X., Voss, H. and Zheng, P., "The determinants of Chinese outward foreign direct investment", *Journal of International Business Studies*, Vol. 38(4), 2007, pp. 499-518.

Research confirms the important role played by institutional quality in determining IFDI.[41] Low institutional quality implies a higher cost of doing business and higher transaction costs.[42] MNEs are likely to avoid countries with high instability, as it can imply sudden changes in the legal framework and a higher risk of expropriation.[43] Similarly, they tend to avoid countries with high levels of corruption and bureaucracy, as they imply a direct extra cost of doing business.[44] On the other hand, compliance with the rule of law and private property rights are valued positively by MNEs. Similarly, ease of doing business (e.g. in terms of access to finance, trade regulation and the number of steps needed to start a business) is another significant driver of inward FDI.[45]

Finally, macroeconomic stability is another relevant driver of inward FDI. The absence of large swings in inflation and exchange rates in a host country is a localisation advantage that can attract FDI by lowering risks related to the expected value of assets and profits generated abroad.

Emerging countries' MNEs (EMNEs) have specific motivations when investing abroad. EMNEs differ from advanced economies' MNEs in that they tend to be characterised by a lack of ownership advantages and international experience and are subject to low institutional quality at home.[46] In addition, they also differ as regards the prominent role still played by state-owned MNEs in emerging economies. For EMNEs, therefore, investing abroad is aimed first and foremost at becoming globally competitive by filling their competitiveness gap.[47] Thus, EMNEs seek to acquire technology and managerial skills and to access highly qualified labour – all factors that are scarce in their home country or would be costly to develop internally. Another distinctive characteristic of EMNEs is that, especially where natural resources are concerned, they appear to be more willing to operate in host countries with low institutional quality than MNEs from advanced economies.[48] Box 1 provides an overview of the activities of the largest MNEs originating from both advanced and emerging economies in terms of their economic performance, capital intensity and overall economic relevance.

The internationalisation of EMNEs is affected by the policies of their national governments, which are often pursued via state-owned enterprises. China is a

41 See Blonigen (2005), op. cit. and Nielsen et al. (2017), op. cit.

42 See Dunning, J.H., "Internationalizing Porter's Diamond", *MIR: Management International Review*, Vol. 33, 1993, pp. 7-15.

43 See Bénassy-Quéré, A., Maylis, C. and Thierry, M., "Institutional Determinants of Foreign Direct Investment", *The World Economy*, Vol. 30(5), 2007, pp. 764-782.

44 See Wei, S.-J., "How Taxing is Corruption on International Investors?", *The Review of Economics and Statistics*, Vol. 82(1), 2000, pp. 1-11.

45 See Carril-Caccia, F., Ghali, S., Milgram Baleix, J., Paniagua, J. and Zitouna, H., "FDI in MENA: Impact of political and trade liberalisation process", *Femise Research Papers*, FEM41-07, Forum Euroméditerranéen des Instituts de Sciences Économiques, 2018; and Corcoran, A. and Gillanders, R., "Foreign direct investment and the ease of doing business", *Review of World Economics*, Vol. 151(1), 2015, pp. 103-126.

46 See Buckley et al. (2007), op. cit.

47 See Amal, M., Baffour Awuah, G., Raboch, H. and Andersson, S., "Differences and similarities of the internationalization processes of multinational companies from developed and emerging countries", *European Business Review*, Vol. 25(5), 2013, pp. 411-428.

48 See Buckley et al. (2007), op. cit.

prime example. Government initiatives such as the "Go Global" policy, the "One Belt One Road" initiative and "China Manufacturing 2025" are fostering and shaping Chinese corporate investment abroad.[49]

Box 1
MNEs and their investment deals

Prepared by Federico Carril-Caccia and Elena Pavlova

Based on real economy indicators, such as foreign activity, the biggest MNEs still originate predominantly from large, advanced economies and the manufacturing sector, although EMNEs and the services sector are growing in importance. According to UNCTAD's 2015 ranking of the world's 100 largest MNEs, only eight were EMNEs. Moreover, 62 came from just four countries: the United States (21 companies), the United Kingdom (17), Germany (13) and Japan (11). More than half of these MNEs operate in the following sectors: motor vehicles; mining, quarrying and petroleum; pharmaceuticals; electricity, gas and water; petroleum refining; and, within the services sector, telecommunications. Of the ten largest MNEs by market capitalisation in 2016, half were in the information and communications technology (ICT) sector.[50]

The world's largest MNEs according to the UNCTAD classification play a prominent role in terms of employment, sales and assets in the host countries in which they operate. The foreign activities of these firms are impressive even when compared with some nation states: the top company in terms of employment abroad has 800,000 employees, which is larger than Estonia's total labour force; the foreign sales volume of one of the most prominent automotive corporations (USD 190 billion) is equivalent to the annual GDP of countries like Greece and Portugal; and the foreign assets held by the largest oil company (USD 290 billion) are close to the annual GDP of economies such as Ireland and Colombia. Similarly, the market capitalisation of one of the most prominent ICT corporations (2016: around USD 600 billion) is on a par with the GDP of Argentina.[51]

Comparing the 92 biggest MNEs from advanced economies with the 100 biggest EMNEs, on average the former recorded 4% higher sales per employee than the latter in 2015. In addition, the capital/labour ratio of advanced economies' MNEs was 31% higher, and the relative importance of their economic activity abroad, as measured by the foreign activity index,[52] was 26% higher (see Chart A).

49 See Huang, Y., "Understanding China's Belt & Road Initiative: Motivation, framework and assessment", *China Economic Review*, Vol. 40, 2016, pp. 314-321; Wuttke, J., "The Dark Side of China's Economic Rise", *Global Policy*, Vol. 8(S4), 2017, pp. 62-70; and Buckley et al. (2007), op. cit.

50 See Gray, A., "These are the world's 10 biggest corporate giants", World Economic Forum, 2017.

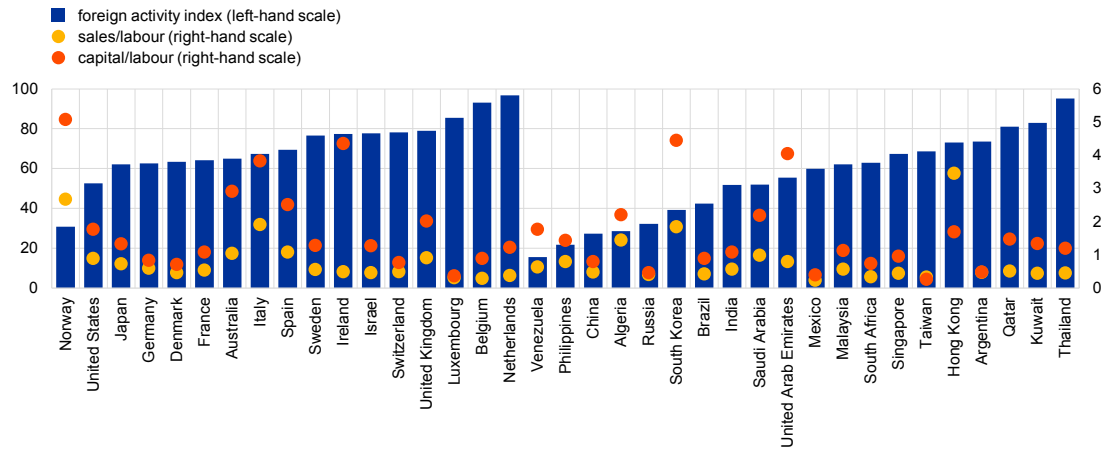
51 See Gray (2017), op. cit.

52 The foreign activity index is calculated on the basis of MNEs' share of employees abroad, as well as foreign assets and foreign sales.

Chart A

Main features of MNEs by country

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



Sources: UNCTAD, World Investment Report 2016 – Investor Nationality: Policy Challenges, United Nations, 2016; and UNCTAD (2017), annex tables 24 and 25 respectively.
Notes: Data refer to the year 2015 and cover the world's 100 largest MNEs and the 100 largest EMNEs. The foreign activity, sales/labour ratio and capital/labour ratio indicators are averaged by country.

Total global FDI is dominated by a relatively small number of very large deals. In 2016 – the last year for which complete data are available – nearly 21,000 FDI projects took place, with a volume of almost USD 1.8 trillion. Out of these projects, 215 M&A deals accounted for 55% of the total volume. In terms of the number of M&A projects worth more than USD 1 billion, the main investors were the United States (18.6%), China (15.4%) and the United Kingdom (8.4%), while the main recipients were the United States (33%), the United Kingdom (11.2%) and Germany (4.7%). Interestingly, about 58% of these very large deals occurred in the services sector.[53]

4 FDI and exports: substitutes or complementary?

When serving a foreign market, FDI and exports have traditionally been seen as substitutes. The underlying idea is that an MNE might prefer to invest abroad rather than export from home in order to forestall the risk of its technological advantage being lost to competitors[54] and to avoid costs such as transportation costs, tariffs and anti-dumping measures[55] ("horizontal FDI"). Through horizontal FDI a firm can exploit its know-how and technological capabilities without them being appropriated by third parties, as might more easily happen through the functioning of supply chains.

In reality, MNEs often complement their exports by owning subsidiaries abroad. This has led to MNEs having an increasing share of world trade.[56] In addition, existing evidence in the literature suggests that there is a positive

53 Statistics are based on UNCTAD (2017), op. cit., annex table 17.

54 See Dunning (1988), op. cit.

55 See Blonigen (2005), op. cit.

56 See Antràs, P. and Yeaple, S.R., "Multinational Firms and the Structure of International Trade", *Handbook of International Economics*, Vol. 4, 2014, pp. 55-130.

correlation between a country's capacity to attract FDI and its level of trade openness.[57] This raises the question of which types of FDI are positively correlated with trade openness and exports from the source to the host country.

First, by means of vertical FDI, MNEs distribute and optimise their production across borders. Headquarters and subsidiaries perform specific economic activities, rather than broad ones, and the different productive sites are linked via trade (i.e. imports and exports).[58] This type of investment is efficiency-seeking in nature: MNEs exploit different characteristics across countries in order to minimise costs. As a result, global production processes become more fragmented as firms locate their production and source their inputs across national borders.

Second, FDI can also serve as a tool for enhancing the market penetration of exports. Export-supporting FDI refers to MNEs' investment in the wholesale and retail sector.[59] Under this model, the MNE sets up a subsidiary in a foreign country in order to import and distribute its goods or services. In this case, unlike in the case of horizontal FDI, bilateral exports of final goods and FDI are positively correlated.

Third, MNEs also invest abroad in order to supply the host country and third countries directly with their products. "Export-platform FDI" is aimed at serving regions in a way which can either complement or substitute exports.[60] This investment strategy, which is typically directed at countries belonging to a common market, will be pursued if the production costs in the home market and trade costs of serving a given foreign market together are higher than the costs of producing and exporting from a third country. This type of investment does not necessarily entail the replication of the firm's entire economic activity abroad, as trade in intermediates and services will probably take place between the firm's headquarters and its foreign subsidiaries, thereby contributing to the functioning of global value chains.

Trade liberalisation policies are expected to affect each of the aforementioned types of FDI – horizontal, vertical, export-supporting and export-platform – in different ways. They are likely to hamper horizontal FDI, as they reduce trade costs and thus reduce the incentive to produce in foreign markets instead of exporting. Bilateral trade liberalisation involving "deep" trade agreements (e.g. including non-trade provisions on investment and competition, legal and institutional provisions, and economic collaboration) tends to facilitate vertical and export-supporting FDI. The profitability of both strategies increases as trade costs fall. For export-platform FDI, the relationship is more ambiguous, as its nature can vary from being purely horizontal to being similar to export-supporting FDI. Nevertheless, it will always seek to serve not only one country but a whole region.

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57 Trade openness is defined as the ratio of total trade to GDP. See Chakrabarti, A., "The Determinants of Foreign Direct Investments: Sensitivity Analyses of Cross-Country Regressions", *Kyklos*, Vol. 54(1), 2001, pp. 89-114.

58 See Hanson, G.H., Mataloni Jr, R.J. and Slaughter, M.J., "Vertical Production Networks in Multinational Firms", *The Review of Economics and Statistics*, Vol. 87(4), 2005, pp. 664-678.

59 See Krautheim, S., "Export-supporting FDI", *Canadian Journal of Economics/Revue canadienne d'économique*, Vol. 46(4), 2013, pp. 1571-1605.

60 See Ekholm, K., Forslid, R. and Markusen, J.R., "Export-platform foreign direct investment", *Journal of the European Economic Association*, Vol. 5(4), 2007, pp. 776-795.

Box 2 focuses on the relationship between M&As and the value added that is embedded in exports. The results obtained show a complementarity between M&As and exports from the source to the host country, mostly owing to export-supporting FDI.

Box 2
The relationship between M&As and the value added embedded in exports

Prepared by Federico Carril-Caccia and Elena Pavlova

To investigate the relationship between M&As and exports, an augmented gravity model is estimated. This model sheds light on how M&A investments from source country i to host country j are affected by different measures of export flows from i to j. We estimate the following equation:[61]

$$MA = f(GDPsum, diffGDPpc, currency, PTA, BIT, rulelaw, exports)$$

In this way, this model takes into account the economic size of the source and destination countries ($GDPsum$), their capital intensity difference ($diffGDPpc$), whether they share a currency ($currency$), the existence of a preferential trade agreement (PTA) or a bilateral investment treaty (BIT), and the institutional quality in the home and host countries ($rulelaw$).[62] The variable of interest is $exports$, which denotes the extent to which variation in exports from the source to the host country in a given year affects M&As. Under the substitution hypothesis (i.e. horizontal FDI), a negative correlation is expected, while a positive correlation would imply complementarity between M&As and exports (i.e. vertical FDI or export-supporting FDI).

This analysis is based on a bilateral M&A database from Thomson Reuters, which is combined with the World Input-Output Database (WIOD). The dataset covers the period 2000-14 and 41 source and destination countries, representing more than 80% of world trade, M&As and GDP during the period. The M&A database allows the number of M&A projects and their value to be studied separately, with the former referring to the capacity to create new bilateral relationships and the latter to the capital flow. The WIOD database allows exports of final and intermediate goods to be considered separately, as well as the value added embedded in them. Thus, the domestic value added embedded in final and intermediate goods exports, the domestic value added which returns home via final and intermediate exports, and the foreign value added embedded in final and intermediate goods exports[63] are considered separately in the analysis. By using the value added embedded in exports, as opposed to gross exports, it is possible to account

61 The estimator used is the Poisson Pseudo Maximum Likelihood (PPML). See Santos Silva, J.M.C. and Tenreyro, S., "The Log of Gravity", *The Review of Economics and Statistics*, Vol. 88(4), 2006, pp. 641-658.

62 In addition, the model includes country-pair fixed effects to take into account all time-invariant transaction costs across pairs of countries (e.g. distance) and year fixed effects to account for global macroeconomic trends.

63 The value added in exports is decomposed in accordance with Wang, Z., Wei, S.J. and Zhu, K., "Quantifying International Production Sharing at the Bilateral and Sector Levels", *NBER Working Papers*, No 19677, 2013. See also the article entitled "The impact of global value chains on the macroeconomic analysis of the euro area", *Economic Bulletin*, Issue 8, ECB, 2017.

for the domestic and foreign inputs used for exporting. Moreover, the issue of double counting of exports and imports is avoided.[64]

Table A

M&As and the value added embedded in exports

(results from estimating the gravity model; dependent variable: M&As)

	Domestic value added in final goods exports	Domestic value added in intermediate goods exports	Domestic value added in exports which returns home via final and intermediate imports	Foreign value added in final goods exports	Foreign value added in intermediate goods exports
M&A projects	0.094**	0.077	0.066**	0.083**	0.068
	(0.04)	(0.07)	(0.03)	(0.03)	(0.06)
R^2	0.946	0.945	0.946	0.946	0.945
M&A value	0.418*	0.119	0.144	0.456**	0.096
	(0.22)	(0.23)	(0.10)	(0.22)	(0.20)
R^2	0.499	0.491	0.487	0.504	0.489
Observations	17,671	17,699	17,668	17,671	17,670

Sources: Thomson Reuters, WIOD (2016 release) and ECB calculations.
Notes: Robust standard errors in parentheses, clustered at the country-pair level.
*** p-value<0.01; ** p-value<0.05; * p-value<0.10.

The estimation results in Table A show that M&As are mainly export-supporting and, to a significant extent, vertical. Exports of final goods, irrespective of the domestic or foreign value added embedded in them, have a positive impact on the number of M&A projects and their value. This finding suggests that M&As are mostly export-supporting. By contrast, overall exports in intermediate goods do not have any effect on either the number of projects or their value. However, in terms of the number of projects, domestic value added in exports which returns home via final and intermediate imports processed abroad does have a positive impact. All in all, this last result provides some evidence of vertical FDI being positively correlated with the exporting of intermediate goods which are processed abroad before returning home.

5 Foreign direct investment in the EU and the euro area

The process of economic, monetary and institutional integration in the EU has been a key driver of FDI. As shown by the analysis in Box 3, joining the EU and the euro area is estimated to have boosted bilateral FDI flows among members by sizeable amounts.

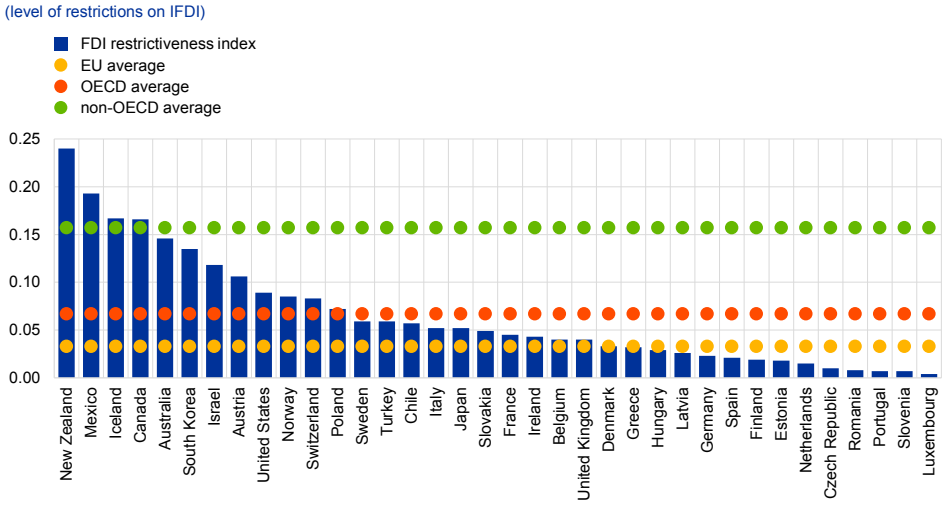
Restrictions on inward FDI across the EU are, on average, lower than in OECD countries. While they are not homogeneous across EU Member States, the restrictions on inward FDI in the EU are, with only two exceptions, lower than the OECD average. According to Chart 4, which shows IFDI regulatory restrictions in 2016, all EU countries apart from Austria and Poland have lower restrictions than the

64 Cross-border trade statistics partially double count trade flows, as a portion of exports consists of imported inputs and some exported output is later reimported into the country of origin. As the origin of the value added is not accounted for in gross trade statistics, the domestic and foreign economic activity embedded in exports and imports respectively may be overestimated. In addition, any analysis based on gross trade data may overestimate the importance of some trading partners and underestimate the importance of others.

OECD average. However, while countries like Luxembourg, Slovenia and Portugal have virtually no restrictions, Austria, Poland, Sweden, Italy, Slovakia and France are significantly above the EU average. At sectoral level, EU Member States have almost no restrictions on FDI in the manufacturing sector, while restrictions in the primary sector are generally larger than in the services sector.

Chart 4

Restrictions on inward FDI in 2016



Source: OECD FDI Regulatory Restrictiveness Index.
Notes: The OECD's FDI Regulatory Restrictiveness Index measures regulatory restrictions on foreign direct investment across 22 economic sectors. It gauges the restrictiveness of a country's FDI rules by focusing on four main types of restriction on FDI: (i) foreign equity limitations; (ii) discriminatory screening or approval mechanisms; (iii) restrictions on the employment of foreigners as key personnel; and (iv) other operational restrictions, e.g. restrictions on branching and capital repatriation or land ownership by foreign-owned enterprises.

The EU's weight in global IFDI decreased after 2007, but has rebounded somewhat since 2015. Although, on average, EU restrictions on IFDI are significantly below both the OECD and the non-OECD average, the combined share of EU Member States in global IFDI declined significantly in the period 2008-14, before partially recovering. Chart 1 illustrates the distribution of world IFDI across three country clusters: the EU (including intra-EU IFDI), other advanced economies and EMEs. Before 2008 EU countries were the main recipients of global FDI. On average, between 2000 and 2007, EU countries attracted 43.1% of the world's FDI, while other advanced economies attracted 23.8% and EMEs 33%. By contrast, in the period 2008-16 there was a significant shift in the distribution of FDI in favour of EMEs and to the detriment of the EU. In this period the EU attracted, on average, only 26.7% of the world's FDI, while 25.2% went to other advanced economies and 48.1% went to EMEs.

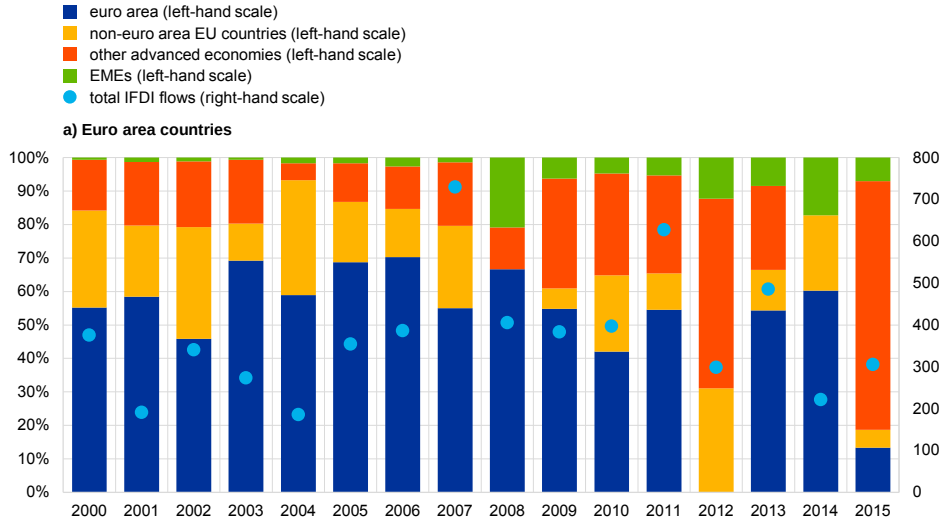
The Great Recession triggered by the financial crisis of 2007-08 has adversely affected the EU's capacity to attract FDI. As Chart 5 shows, between 2000 and 2015, IFDI was more volatile in non-euro area EU countries than in the euro area. Accordingly, the drop in IFDI into the EU owing to the crisis has been more marked in non-euro area EU countries. The gradual decline in IFDI into euro area economies has been driven mainly by the drop in FDI from non-euro area EU countries and by

the euro crisis in 2012. Meanwhile, for non-euro area EU countries, there has been a significant decline in IFDI received from all EU Member States since 2008.

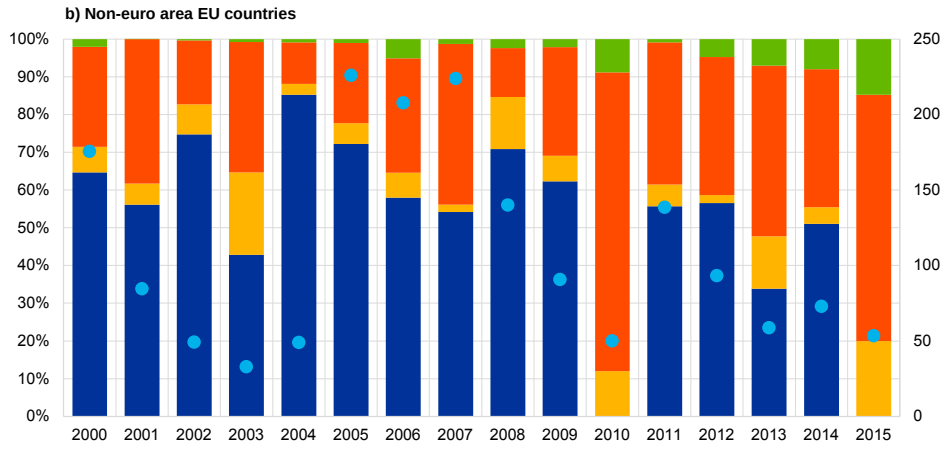
Since 2007 the EU's position as a source of FDI within the region has also been in decline. For euro area countries, other euro area countries continue to be the main source of FDI, but their weight gradually decreased during the first years of the Great Recession. In addition, intra-euro area FDI plunged in 2012 (see Chart 5). For non-euro area EU economies this trend has been even more severe: in 2008 euro area countries accounted for 70% of total IFDI into non-euro area EU countries, but by 2014 that share had fallen to 50%.

Chart 5
Inward FDI flows by origin

(left-hand scale: IFDI into the euro area by origin, percentages; right-hand scale: total IFDI into the euro area, USD billions)



(left-hand scale: IFDI into non-euro area EU countries by origin, percentages; right-hand scale: total IFDI into non-euro area EU countries, USD billions)



Source: OECD BMD3 and BMD4 inward FDI statistics.
Note: BMD3 and BMD4 are the OECD Benchmark Definition of Foreign Direct Investment – third and fourth editions.

Like the rest of the world, the EU has been witnessing a surge in new investors. Chart 5 shows that the share of FDI from EMEs has significantly

increased since 2008 (especially in the euro area), with the top three investors being China, Singapore and Brazil. FDI from EMEs into the EU is mostly driven by a desire to access EU markets and to acquire technologies and brands.[65]

In line with the global trend, EU countries are increasingly investing in EMEs. Outward FDI from EU Member States presents a similar pattern to IFDI. As Chart 6 shows, OFDI from the euro area has been less volatile than OFDI from non-euro area EU countries. While the total volume of OFDI flows from the euro area remained stable during the period 2008-15, for non-euro area EU countries there was an appreciable slowdown. At the same time, both euro area and non-euro area EU countries have significantly shifted the destination of their OFDI in favour of EMEs. This trend can be explained by the sovereign debt crisis, increased economic uncertainty and the low economic growth suffered by most EU countries until recently. In this context, EU MNEs partly reduced their investments abroad and partly re-directed their investments towards fast-growing EMEs with high market potential. Many EU MNEs reduced their investments abroad, particularly in the case of non-euro area EU countries, whose share of OFDI flows to other EU members declined to only 13% in the period 2012-15. Nevertheless, as the economic recovery strengthens, intra-EU FDI is likely to recover.

The latest challenge that the EU is facing is the United Kingdom's upcoming departure from the EU (Brexit). While the impact of Brexit is uncertain, most studies have estimated a reduction in FDI into the United Kingdom of between 12% and 28%.[66] Indeed, Brexit could significantly increase the cost of accessing the EU Single Market from the United Kingdom, making the country less attractive for foreign investors. In addition, changes in regulation that might take place in the United Kingdom after exiting the EU could make doing business in the United Kingdom more costly for EU MNEs.

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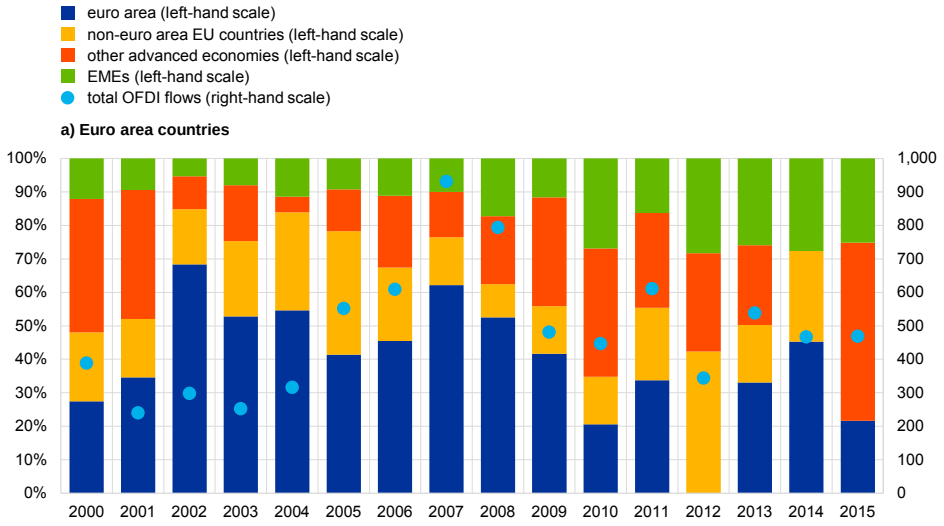
65 See, for example, Blomkvist, K. and Drogendijk, R., "Chinese outward foreign direct investments in Europe", *European Journal of International Management*, Vol. 10(3), 2016, pp. 343-358; Carril-Caccia, F. and Milgram Baleix, J., "From Beijing to Madrid: Profiles of Chinese investors in Spain", *Universia Business Review*, Vol. 51, 2016, pp. 112-129; and Giuliani, E., Gorgoni, S., Günther, C. and Rabellotti, R., "Emerging versus advanced country MNEs investing in Europe: A typology of subsidiary global-local connections", *International Business Review*, Vol. 23(4), 2015, pp. 680-691.

66 See, for example, Dhingra, S., Ottaviano, G., Sampson, T. and Van Reenen, J., "The Impact of Brexit on Foreign Investment in the UK", *CEP Brexit Analysis*, No 3, Centre for Economic Performance, London School of Economics, 2016; Bruno, R., Campos, N., Estrin, S. and Tian, M., "Technical Appendix to 'The Impact of Brexit on Foreign Investment in the UK' – Gravitating towards Europe: An Econometric Analysis of the FDI Effects of EU Membership", Centre for Economic Performance, London School of Economics, 2016; and HM Treasury, "HM Treasury analysis: the long-term economic impact of EU membership and the alternatives", report presented to the UK Parliament by the Chancellor of the Exchequer, 2016.

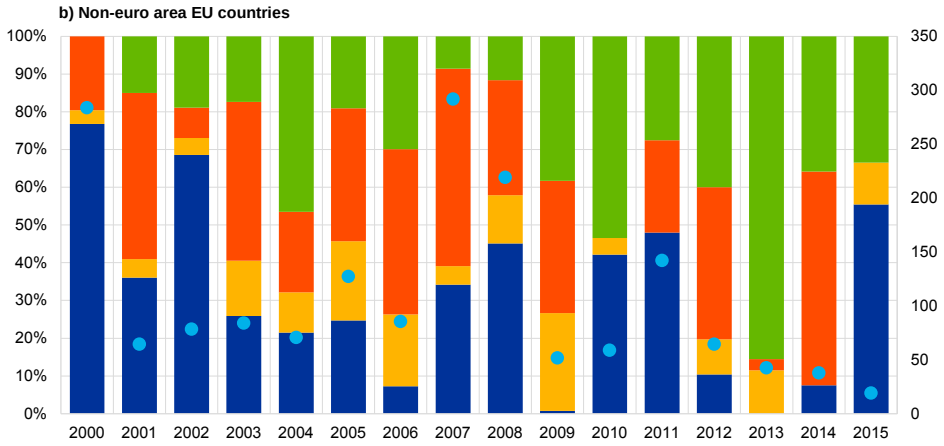
Chart 6

Outward FDI flows by destination

(left-hand scale: euro area countries' OFDI by destination, percentages; right-hand scale: total euro area OFDI, USD billions)



(left-hand scale: non-euro area EU countries' OFDI by destination, percentages; right-hand scale: total non-euro area EU OFDI, USD billions)



Source: OECD BMD3 and BMD4 outward FDI statistics.
Note: BMD3 and BMD4 are the OECD Benchmark Definition of Foreign Direct Investment – third and fourth editions.

Box 3
The impact of EU and euro area integration on FDI flows

Prepared by Federico Carril-Caccia and Elena Pavlova

The economic impact of regional integration in Europe has been widely addressed in the literature. The main focus has been on the impact on trade, but some studies have also given insights into how the EU and, in particular, the euro area have affected FDI among their members. These studies[67] tend to show significant growth in FDI among EU Member States. As regards EU membership, the estimated increase in FDI ranges between 28 and 83 percentage points, while the incremental effect of euro area membership ranges between 21 and 44 percentage points. However, these studies consider different periods and different sets of countries, so they are not fully comparable and they measure the impact of EU accession and euro adoption for different countries.

In order to overcome these issues, we use a bilateral FDI flows database covering the period 1985-2012 for 34 host countries and 70 source countries.[68] The countries and time period covered mean that we take into account the accession of 17 countries into the EU and the whole process of Economic and Monetary Union (EMU). We estimate the following equation:[69]

$$FDI = f(GDPsum, diffGDPpc, PTA, BIT, SIMI, diffHC, reer, invpro, govstab, law, EU, EA, noEUtEU)$$

where FDI represents the FDI flows from one country to another. With this model we take into account the demand and supply sides ($GDPsum$), the capital intensity difference between a pair of countries ($diffGDPpc$), whether countries have signed a preferential trade agreement (PTA) or a bilateral investment treaty (BIT), the economic size similarity ($SIMI$) and the difference in human capital endowment between the source and host country ($diffHC$). Moreover, the equation controls for the real exchange rate ($reer$) and a set of institutional indicators to account for institutional quality.[70] Our variables of interest are EU_{ijt}, which is a dummy that takes the value 1 in year t whenever a pair of countries are EU members, EA_{ijt}, which is a dummy that takes the value 1 in year t whenever a pair of countries belong to the euro area, and $noEUtEU_{ijt}$, which is a dummy that takes the value 1 in year t whenever the destination country is an EU member.[71]

The results indicate that, on average, joining the EU increased inward FDI flows from other EU countries by 43.9%, but did not have a significant impact on a country's capacity to attract FDI from non-EU countries. On average, adopting the euro increased FDI from other euro area members by 73.7%. Thus, the additional effect of belonging to the common currency area can

67 See, for example, Brouwer, J., Paap, R. and Viaene, J.-M., "The trade and FDI effects of EMU enlargement", *Journal of International Money and Finance*, Vol. 27(2), 2008, pp. 188-208; De Sousa, J. and Lochard, J., "Does the Single Currency Affect Foreign Direct Investment?", *The Scandinavian Journal of Economics*, Vol. 113(3), 2011, pp. 553-578; Flam, H. and Nordström, H., "The euro and Single Market impact on trade and FDI", manuscript, Institute for International Economic Studies, Stockholm University, 2007; Dhingra et al. (2016), op. cit.; and HM Treasury (2016), op. cit.

68 Data are taken from OECD BMD3 FDI statistics.

69 Based on the Poisson Pseudo Maximum Likelihood estimator – see Santos Silva and Tenreyro (2006), op. cit.

70 Indicators of institutional quality include investment protection ($invpro_{it}, invpro_{jt}$), government stability ($govstab_{jt}$) and the enforcement of law (law_{jt}).

71 In addition, the model includes country-pair and year fixed effects to take into account all time-invariant transaction costs across pairs of countries (e.g. distance) and global macroeconomic trends.

be estimated at around 20%.[72] Indeed, the EU reduced the cost of doing business across the borders between its members, and the euro area stimulated cross-border capital flows among its members, as exchange and liquidity risk were eliminated.[73] The results also indicate that membership of the EU and the euro area partially mitigated the negative trend in IFDI after the Great Recession that was highlighted in the previous section.

6 Conclusions

The prominence of FDI has increased significantly over the past 16 years, rising from 22% to 35% of world GDP. FDI has traditionally originated from advanced economies, but two important developments have occurred since the Great Recession:

- EMEs have gained in weight both as recipients and as sources of global FDI. Since 2013 EMEs have managed to attract more than 50% of total inward FDI and have provided nearly 30% of total outward FDI.
- At the same time, the share of IFDI flowing into and OFDI flowing from advanced economies, in particular the EU, has been gradually decreasing.

FDI is carried out by the most productive firms in source countries via M&As and GI. The relevance of each type of investment varies depending on the source and destination countries concerned and the sector towards which it is directed. FDI flows are largely driven by relatively few deals. More specifically:

- Looking at IFDI, M&As are the main mode of entry into EU countries and other advanced economies, while GI is the most common form of IFDI in EMEs. Regarding OFDI, M&As and GI are similar in importance for the EU and other advanced economies, whereas GI is the preferred form of FDI for EMEs. Nearly 70% of M&As are directed towards the services sector, while GIs are evenly distributed between manufacturing and services.
- The largest MNEs tend to come from advanced economies. Some are so large in terms of sales, assets and number of employees that they are comparable in size to the GDP and labour force of entire countries. Total FDI is driven largely by a small number of very large M&A deals. In 2016 very large M&As accounted for only 1% of the world's FDI projects, but 55% of total FDI flows. The majority of these deals focused on the acquisition of firms in the services sector.

FDI has the potential to produce several positive effects on host economies. Market-seeking FDI is channelled towards catching-up economies with market potential, whereas asset-seeking FDI is aimed at securing access to new or

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72 The additional growth in FDI among euro area members is calculated using the following formula: $(e^{\delta_2-\delta_1-\beta_3}-1)x\ 100$. See Coeurdacier, N., De Santis, R.A. and Aviat, A., "Cross-border mergers and acquisitions and European integration", *Economic Policy*, Vol. 24(57), 2009, pp. 56-106.

73 See Rodriguez Palenzuela, D., Dees, S. and the Saving and Investment Task Force, "Savings and investment behaviour in the euro area", *Occasional Paper Series*, No 167, ECB, January 2016.

complementary capabilities for MNEs. Natural resource-seeking FDI is directed towards EMEs, but large natural resource endowments in a host country can also deter FDI under certain circumstances. Efficiency-seeking FDI is mainly driven by low labour costs. High institutional quality, ease of doing business and macroeconomic stability can help attract FDI, as these factors reduce the adverse risks associated with investment. Finally, M&As are mainly complementary to trade, rather than a substitute for it.

Turning to Europe, EU and euro area membership has fostered FDI among members. EU countries have, on average, fewer restrictions on FDI than the rest of the world. Since the Great Recession, however, the EU is no longer the world's main FDI investor and recipient and its share has gradually declined. However, the decline in IFDI and OFDI has been more marked for non-euro area EU countries than for euro area countries. The latter have continued to receive sizeable IFDI flows, stemming mainly from other advanced economies outside of the EU.

2 Measuring and interpreting the cost of equity in the euro area

Prepared by André Geis, Daniel Kapp and Kristian Loft Kristiansen

Equity capital is among the main sources of funding for euro area non-financial corporations (NFCs), making it an important factor in the transmission of monetary policy. From a central bank perspective, improving the measurement and understanding of the cost of equity is therefore essential.

Unlike the cost of debt, which has declined substantially in recent years, the cost of equity has remained relatively stable at elevated levels. Results from the analysis performed in this article suggest that a persistently high "equity risk premium" (ERP) has been the key factor underpinning the high cost of equity for euro area NFCs. In fact, since the start of the global financial crisis, increases in the ERP have largely offset the fall in the yield of risk-free assets.

This article argues that the widely used workhorse model to derive the cost of equity and the ERP, namely the three-stage dividend discount model, can be improved upon. In particular, incorporating short-term earnings expectations, discounting payouts to investors with a discount factor with appropriate maturity, and considering share buy-backs all yield beneficial refinements. This in turn would strengthen the theory and basis of the model and improve the robustness of its estimates. Most notably, share buy-back activity seems to matter, specifically for the level of the ERP. Notwithstanding such improvements in the modelling approach, estimating the ERP, particularly its level, remains subject to considerable uncertainty. Ultimately, such uncertainty advocates the use of a variety of models and survey estimates, as well as a focus on the dynamics, rather than on the level, of the ERP.

From an applied perspective, the article demonstrates that cost of equity modelling can be used to disentangle the different drivers of changes in equity prices. This is helpful from a monetary policy perspective, as changes in equity prices can contain important information about the economic outlook and warrant monitoring for financial stability purposes. Moreover, the article shows that adding an international perspective to the analysis of the ERP for the overall market may provide valuable insights for policymakers. For instance, the greater reliance on share buy-backs among companies in the United States than those in the euro area appears to be behind some of the recent steeper decline in the ERP in the United States when compared with the ERP in the euro area.

1 Introduction

While equity provides a substantial source of funding for euro area NFCs, calculating the actual cost of raising equity financing is challenging. Unlike the cost of debt, which can often be readily observed, the cost of equity, representing the required return investors demand for bearing the risk of equity ownership, has to be estimated. This leaves the magnitude and the trajectory of the cost of equity – a

variable that is important from a corporate finance, investment or policy perspective – subject to considerable uncertainty. Advancing on strategies commonly employed to estimate the cost of equity would therefore be expected to yield considerable benefits for companies, investors and policymakers by allowing them to arrive at better informed decisions.

From the viewpoint of a central bank, improving estimates of the cost of equity are desirable, primarily for three, partly inter-related, reasons:

- **The cost of equity is part of the monetary policy transmission mechanism.** Changes in the monetary policy stance can affect equity prices and the cost of equity via three channels: the potential implications for future corporate profits; the interest rates employed to discount such profits; and perceptions of risk. The marginal cost of an additional unit of equity capital, contrasted with the marginal return of an additional unit of investment, can contribute to determine the viability of an investment project. As a result, changes to the cost of equity may dampen or stimulate corporate investment. Likewise, equity price developments can, to some extent, also influence the financial wealth of households and therefore their consumption decisions.

- **Changes in the determinants of the cost of equity can reveal the views of market participants about the economic outlook, which explains why central banks use such changes as an indicator of the (expected) state of the economy.** In particular, changing perceptions about the economy are likely to be mirrored in corresponding movements in equity prices which represent a discounted flow of future income. This role of equity prices as a gauge of economic activity also highlights why understanding their drivers is important for central banks.

- **Equity prices and, by implication, the cost of equity need to be monitored from a financial stability perspective.** Clearly, the cost of equity relative to the cost of debt may influence decisions about corporate capital structure and leverage. Moreover, equity prices that are out of line with macroeconomic fundamentals might trigger disorderly equity market corrections with possible adverse spillovers to other asset classes and the real economy. In extreme circumstances, this may also impair the monetary transmission mechanism. For this reason, the ECB's Financial Stability Review regularly examines equity prices and equity valuations. Similarly, assumptions about future equity prices constitute an input to the ECB's macroeconomic projection exercises and to the stress tests of euro area banks.

Against this background, this article examines various methods for estimating the cost of equity for euro area corporations, with a particular emphasis on the ERP which is the most difficult component to estimate. In Section 2, the article recalls the role of equity financing for euro area NFCs and reviews developments of the cost of equity and the ERP over time, including in comparison with other means of corporate financing. Section 3 presents a range of approaches for estimating the ERP, including the Fed model, the Gordon growth model and the dividend discount model. While presenting each model with its underlying rationale, the section also

shows a practical application of the dividend discount model and Box 1 introduces an improved version of the dividend discount model which aims at addressing several of its shortcomings. Finally, Section 5 puts the euro area ERP into perspective by contrasting developments in the euro area with those in the United States. Section 6 concludes.

2 Vital but costly – equity financing in the euro area

2.1 The role of equity financing for euro area NFCs

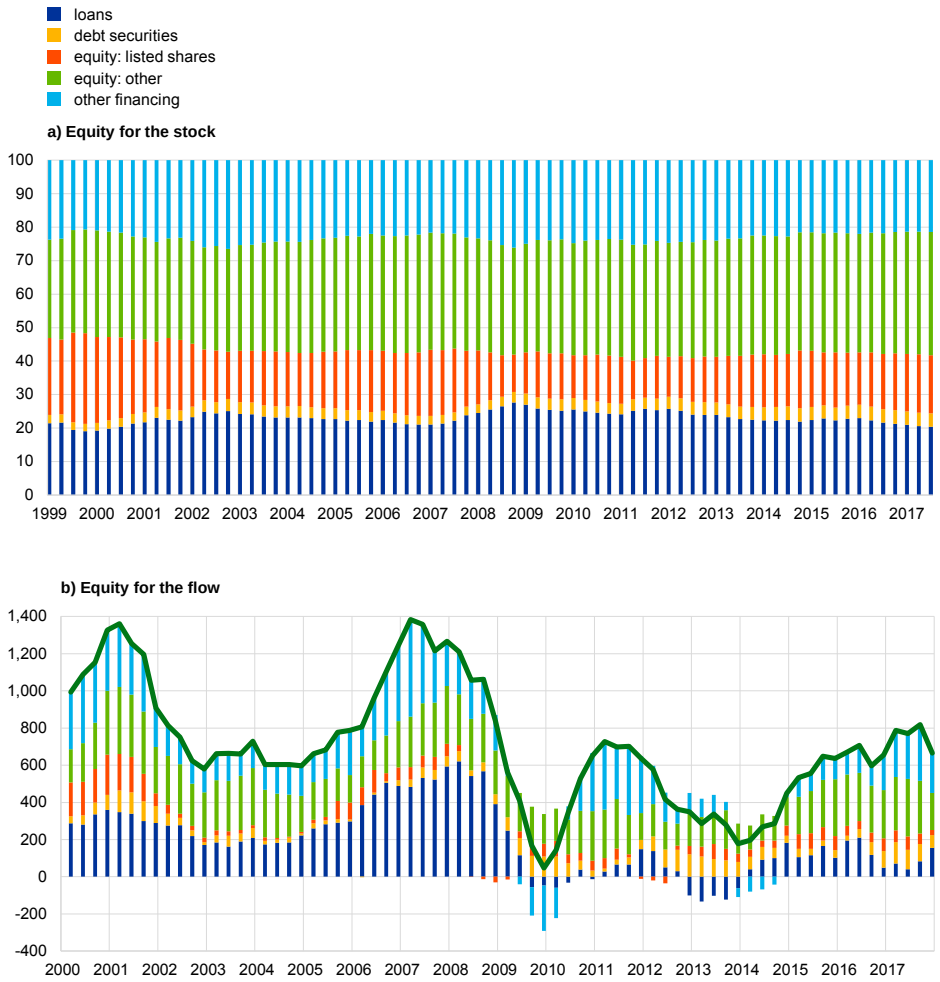
Various forms of equity financing have consistently provided a significant part of the funding structure of euro area NFCs. Owing to its perpetual nature, one euro of equity financing cannot be compared directly with one euro of debt financing. Since debt financing has to be rolled over frequently, it might be more appropriate to judge the importance of equity from a stock, rather than a flow, perspective. On aggregate, listed shares and other forms of equity financing, including the retention of earnings and the issuance of unquoted shares, accounted for 54% of the notional stock of outstanding corporate financing instruments in the fourth quarter of 2017 (see Chart 1a), putting it ahead of loans (20%), debt securities (4%) and other means of financing (22%). The share of equity financing in the outstanding stock of corporate financing instruments measured at market value has remained comparatively stable since 1999. It increased only slightly from 52% in the first quarter of 1999 to 54% by the fourth quarter of 2017. Over the same horizon, the share of loans declined from 22% to 20% and the share of debt securities rose from 3% to 4%.

Turning to the procurement of new funding by euro area NFCs, equity also constitutes a substantial source, albeit not always in the form of listed shares. Indeed, data capturing net financing flows to euro area NFCs attribute a comparatively minor role to issuing listed shares as a way of raising capital, particularly when compared with other funding instruments (see Chart 1b). Euro area NFCs have instead relied to a considerable extent on other forms of equity capital for their financing. Over certain periods such other forms even became the primary source of funding, for example in the wake of the global financial crisis, when new lending from monetary financial institutions became highly constrained. Although the provision of loans and the issuance of debt securities have noticeably recovered in recent years, other forms of equity have still accounted for a considerable share of net financing flowing to euro area NFCs.

Chart 1

The role of equity for the stock and flow of euro area NFC financing

(percentages; EUR millions, four-quarter sums)



Source: ECB.
Notes: The latest observations are for the fourth quarter of 2017. Loans include monetary financial institutions (MFI) loans, non-MFI loans and loans from the rest of the world. Other financing includes inter-company loans, trade credit and residual forms of financing. Figures are measured at market value.

2.2 Euro area NFCs' cost of equity

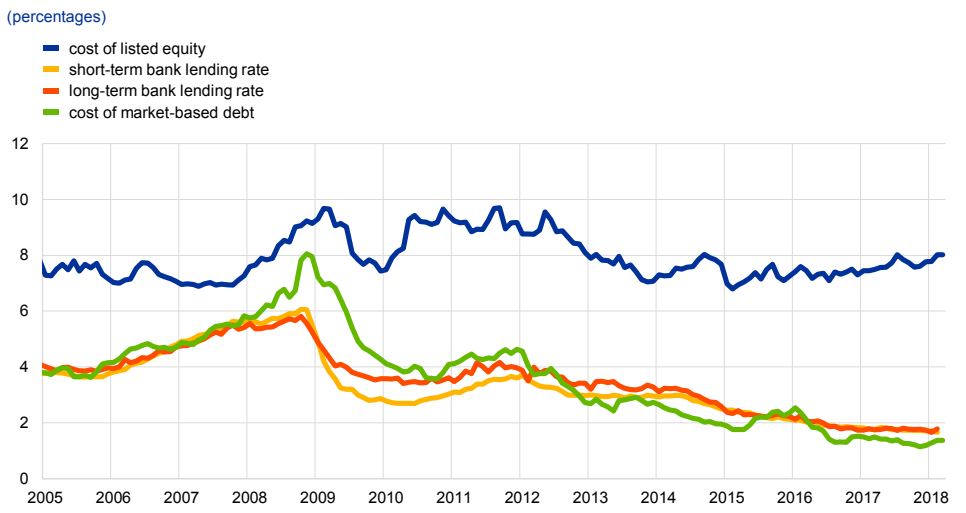
In contrast to the cost of debt, the cost of equity, which represents the required return investors demand for the risk of equity ownership, has to be estimated. The cost of debt can usually be readily observed in the market, such as in the form of a bond yield or the interest rate charged on a loan, and consists of a risk-free rate of interest augmented by a credit risk premium that is determined by the riskiness of the borrower. The size of the credit risk premium is therefore relatively straightforward to obtain, by subtracting the observable risk-free rate from the observable bond yield or the interest rate paid for a loan. Similarly, the cost of equity is commonly estimated by augmenting a risk-free rate of interest by an ERP. The ERP reflects the compensation investors demand for holding shares that entitle them to the (risky) residual claim on the profits of a company after all its other

obligations have been met. However, unlike the cost of debt and the credit risk premium, neither the cost of equity nor the ERP are directly observable. For *listed shares*, the cost of equity and the ERP have to be estimated by applying a suite of different modelling approaches. These include the current share price, a risk-free rate and future streams of income, such as earnings or dividends, anticipated by investors. For unquoted shares and other forms of equity financing such as retained earnings, deriving the cost of equity is even more demanding because the current share price cannot be observed. Furthermore, additional risk premia may apply in these cases in order to capture, for example, the illiquidity of unquoted shares. For these reasons the remainder of this article only considers the cost of listed equity.

The cost of equity listed by euro area NFCs has remained relatively high in recent years. In particular, it has not declined in line with the cost of debt (see Chart 2), which has benefited more directly from the Eurosystem's non-standard monetary policy measures. This has rendered equity financing, as opposed to borrowing from banks or the issuance of bonds, a comparatively expensive mean of corporate funding in recent years.

Chart 2

Nominal external financing costs of euro area NFCs

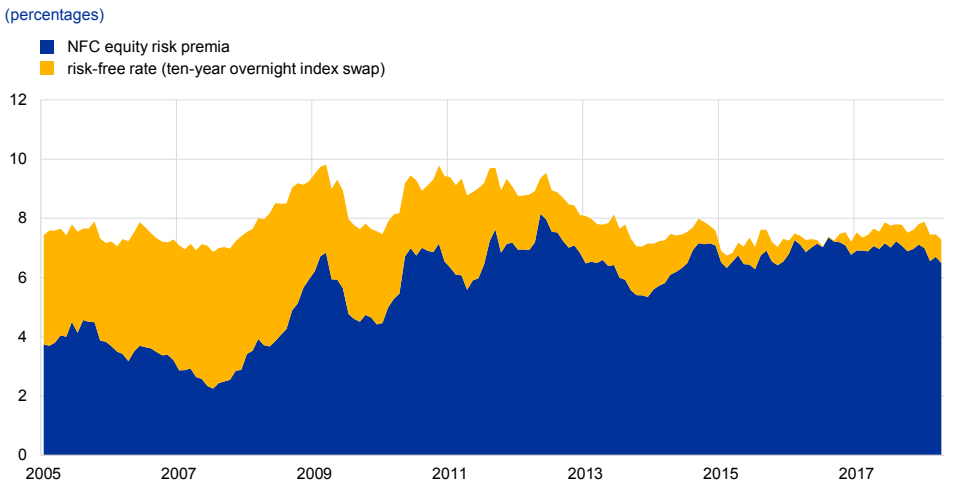


Source: ECB.
Notes: The latest observations are for February 2018 (short-term and long-term bank lending rates) and March 2018 (cost of listed equity and cost of market-based debt).

A persistently elevated ERP has been the key factor underpinning the high cost of equity for euro area NFCs. The cost of equity usually defines the required rate of return on equity at which future dividends are discounted and is calculated as the sum of the ERP and the long-term risk-free rate. While risk-free rates have declined to historic lows, the ERP has continued to fluctuate around its level of early 2009 when the slump in equity prices accelerated after the collapse of Lehman Brothers in the previous autumn (see Chart 3). In fact, the portfolio rebalancing channel of the Eurosystem's non-standard monetary measures seems to have had much less of an effect on equity markets than on debt markets. Whereas there is copious evidence that the various asset purchase programmes of the Eurosystem

have contributed to investors seeking higher duration or credit risk,[74] evidence concerning this channel being at play in equity markets remains more scarce.

Chart 3
Decomposition of NFCs' cost of equity



Sources: Thomson Reuters and ECB calculations.
Notes: Monthly data. The latest observations are for April 2018.

3 Modelling the ERP

Unlike the credit risk premium, the ERP by its nature cannot be observed, meaning that it has to be estimated on the basis of a model and by making a series of assumptions. Various models have been proposed to estimate the ERP, ranging from the simple assumption that the ERP is the difference between the current equity yield and its historical mean, to regression-based approaches and dividend discount models (DDMs).[75] Arguably, the most common and theoretically sound approaches to estimate the ERP include a notion of estimating and discounting future dividend streams – the foundation of DDMs – which is the main focus of this section.

The cyclically adjusted price/earnings (CAPE) ratio suggested by Shiller only provides indirect and imprecise information on the ERP. The CAPE is calculated as the ratio of stock prices to the ten-year moving average of earnings. When inverted, it gives the average earnings to current prices, also known as the historical earnings yield or the "inverse Shiller's CAPE ratio" (see Chart 4). This metric is used as a benchmark for determining the value of equities relative to earnings through a (ten-year) cycle: when the metric is high, equity prices are comparatively low and the

74 See, for example, Altavilla, C., Carboni, G. and Motto, R., "Asset purchase programmes and financial markets: lessons from the euro area", *Working Paper Series*, No 1864, ECB, November 2015, or Andrade et al., "The ECB's asset purchase programme: an early assessment", *Working Paper Series*, No 1956, ECB, September 2016.

75 For a complete review across different classes of ERP models, see Duarte, F. and Rosa, C., "The Equity Risk Premium: A Review of Models", *Economic Policy Review*, Federal Reserve Bank of New York, 2015.

equity risk compensation is high, making it attractive to buy equity. Besides the obvious flaw of comparing past earnings with forward-looking yields, the historical earnings yield might be a misleading valuation benchmark in environments where earnings and interest rates are not moving together in line with past regularities. In particular, the historical earnings yield does not capture the fact that a given stream of earnings has a larger discounted value in a low interest rate environment than in one with a high interest rate. In this respect, it is also clear that the inverse CAPE ratio measures the absolute return on equity and not the excess return over the risk-free rate. Therefore, even if the inverse CAPE ratio may provide some useful information on the ERP, it cannot be seen as an estimate for the ERP.

One proposal for estimating the ERP is the Fed model, where the longer-term risk-free yield is subtracted from the inverse CAPE ratio – resulting in the so-called Fed spread (see Chart 4). A low level of the Fed spread suggests that equity prices are high relative to realised earnings and risk-free yields. It follows that the difference between the Fed spread and the inverse of the CAPE should be large in times of high interest rates, such as between 2002 and 2007, while it has been relatively small in recent years.

Chart 4

Common simple metrics of equity yield and the ERP: the CAPE and the Fed spread

Sources: Thomson Reuters and ECB calculations.
Note: The latest observations are for 13 April 2018.

The Fed spread however is subject to some practical and theoretical shortcomings. Most importantly, the Fed spread compares past earnings with present prices, which is inconsistent with the notion of forward-looking economic agents, and provides a reason for turning towards DDMs – the class of models presented below. As a result, the Fed spread often turns negative for prolonged periods, especially in times of relatively high interest rates, implying that market participants should be willing to hold equities at a negative premium compared with a

risk-free asset. This observation is not in line with surveys and fundamental asset pricing theory.[76]

The origin of a forward-looking approach to equity valuation can be found in the Gordon growth model (see Chart 5). The model augments the concept of the Fed spread by the basic intuition that the value of a stock is determined by the value of all discounted *future* cash flows it produces for shareholders.[77] Historical dividends are only relevant to the extent that they contain information on future dividends. In the original representation of the Gordon growth model, payouts to shareholders are simply assumed to grow at a constant rate over time, equal to the expected growth rate of the economy. The difference in the notion of a backward-looking estimation of the ERP, such as the Fed spread, and a forward-looking one, such as the Gordon growth model, can for example be seen during times of economic recovery, as observed in the euro area in recent years. While the ERP implied by the Fed spread declined from around 8% in 2016 to close to 4% at the current juncture, the improvement in earnings *expectations*, as judged by an improvement in expected long-term economic growth, resulted in a much lesser degree of implied ERP tightening as a result of the Gordon growth model.

As such, the Gordon growth model is the foundation and the simplest form of the class of DDMs – which link equity prices to expected future shareholder payouts, risk-free interest rates and an additional compensation for risk. DDMs conveniently allow for changes in equity prices to be broken down into contributions from three factors: (i) changes in expected future cash flows from equities in the form of dividends; (ii) changes in the long-term risk-free rate; and (iii) changes in the ERP.

To the extent that expected dividends, long-term risk-free interest rates and equity prices can be observed via financial market data, the ERP can be found by equating the discounted sum of future cash flows to the prevailing stock prices. The path of future expected dividends, however, is inherently unobservable and would need to be proxied on the basis of observable indicators combined with economically plausible assumptions.

One common refinement to the Gordon growth model is the three-stage DDM, which assumes that the expected dividend growth rate varies over the course of different phases and converges to a constant long-term value. In the three-stage model, three separate phases for the dividend growth rate are commonly assumed: (i) an initial period during which dividends grow constantly at a rate of g_a; (ii) an intermediate period over which the initial growth rate converges linearly towards a long-term growth rate (g_n); and (iii) a final indefinite period, where dividends grow at the constant annual long-term rate (g_n). With the current dividend in place, this assumed sequence of growth rates identifies the complete evolution of expected future dividends.

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76 The model is sometimes adjusted to equate real earnings to the real yield, which however does not address the shortcomings of a backward-looking valuation metric; see Gordon, M.J., *The Investment, Financing, and Valuation of the Corporation*, R.D. Irwin, Homewood, Illinois, 1962.

77 However, as shown in Box 1, it should be noted that while dividends represent the largest share cash flows to investors, buy-backs also form an important part of shareholder compensation.

This workhorse model allows for an easy estimation of the ERP, which can be readily obtained from observed dividend yields and the risk-free rate.[78] It can be calculated using the expression shown in the equation below, which is an approximation of the three-stage DDM, also known as the "H-model".[79] In the equation, r denotes the required rate of return on a stock (or stock price index), r_f the risk-free long-term rate, ERP the ERP, and D_0/P_0 the current dividend yield, while g_a and g_n are the two dividend growth parameters. The parameter H is the length of the initial period (first stage) plus half the length of the intermediate period (second stage). For the implementation of the model, the initial (first stage) dividend growth rate (g_a) can be approximated by I/B/E/S "long-term" earnings projections[80] and the long-term growth rate (g_n) (third stage) by long-term year-on-year GDP growth expectations, as reported by Consensus Economics. Stock prices and initial dividends are taken directly from financial markets, while the long-term risk-free rate is gauged from the ten-year overnight index swap rate. The latter is subtracted from the required rate of return in order to calculate the ERP. Changes to the equity price index can then be broken down into changes in growth expectations (as captured by changes in the g-parameters), changes in the long-term risk-free rate, or changes in the calculated equity premium.

$$r = r_f + ERP = \frac{D_0}{P_0}[(1 + g_n) + H(g_a - g_n)] + g_n$$

- **Since short to medium-term earnings expectations are often higher than longer-term economic growth estimates, the resulting ERP from the H-model approximation is higher compared with that resulting from the simple Gordon growth model (see Chart 5).** This regularity can easily be observed by the increasing difference in level between both ERP estimates since the height of the financial crisis. At the same time, this observation highlights the sensitivity of the ERP estimate to changes in assumptions surrounding future payouts to shareholders (see also Box 1).

- **In practice, gauging estimates of expected future dividend growth is difficult and using aggregated analysts' forecasts to capture shorter-term growth expectations seems questionable.** On the one hand, aggregate analysts' expectations have been criticised by some for the reason that they lag, rather than lead, the economic cycle at times and are overly optimistic.[81] This is problematic if, at the same time, equity prices reflect a more up-to-date view of the economy going forward as perceived by stock market participants. On the other hand, a better gauge for earnings and dividend expectations than analysts' expectations is hard to come by. Most importantly, one can observe

[78] For an in-depth discussion of the three-stage DDM, see the Box entitled "Recent drivers of euro area equity prices", *Economic Bulletin*, Issue 5, ECB, 2017.

[79] See Fuller, R.J. and Hsia, C.-C., "A simplified common stock valuation model", *Financial Analysts Journal*, Vol. 40, No 5, September-October 1984, pp. 49-56.

[80] The Institutional Brokers Estimate System (I/B/E/S) provides composite estimates of the anticipated annual growth rate of earnings per share over a period of between three and five years.

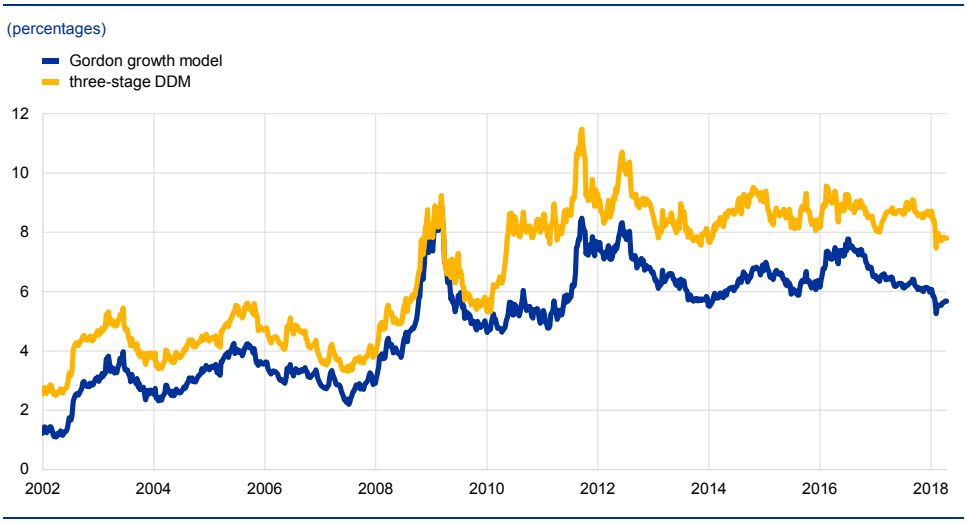
[81] See e.g. Wright et al., "The Equity Risk Premium when growth meets rates", *Goldman Sachs Global Strategy Paper*, No 26, 2017, and Dison, W. and Rattan, A., "An improved model for understanding equity prices", *Bank of England Quarterly Bulletin*, 2017 Q2.

that at least some firms do, over short to medium-term horizons, grow faster than the economy. For this reason data from aggregated shorter-term dividend growth expectations are used to capture earnings expectations at maturities between one and five years ahead. In fact, these data constitute the most widely used source of forward-looking earnings expectations for practitioners.

From a historical perspective, and despite some decline over the past few years, the current estimate for the ERP from the H-model in the euro area remains fairly elevated (see Chart 5), indicating that equities are not particularly highly valued relative to bonds. As estimated by the H-model, the euro area ERP increased significantly to levels between 6% and 8% in the wake of the collapse of Lehman Brothers in 2008 and it has not declined notably since then. Although a degree of uncertainty surrounds these estimates, they nonetheless suggest that equity markets have not increased in line with interest rate decreases in recent years.

Chart 5

ERP resulting from the Gordon growth model and the three-stage DDM



Sources: Thomson Reuters and ECB calculations.
Note: The latest observations are for 13 April 2018.

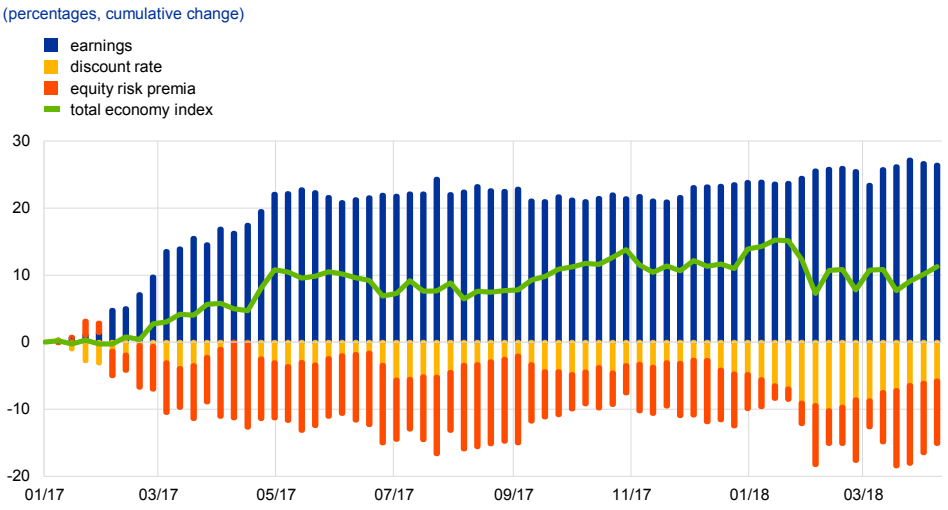
4 Applying the H-model: dissecting changes in euro area equity prices

As demonstrated in the previous section, part of the appeal of the H-model derives from the possibility of dissecting drivers of changes in equity prices. For policymakers, this feature is important for gaining insights into how market participants judge the current economic environment and for drawing potential conclusions for monetary policy. For example, the rise in equity prices over the last year could reflect a decrease in risk premia, a decline in risk-free rates, or an improvement in earnings expectations – all of which lead to very different policy conclusions.

By decomposing changes since early 2017 with the help of the H-model, it can be observed that price increases in euro area equities mainly reflect improvements in earnings growth expectations for euro area firms, despite some bouts of volatility in recent months (see Chart 6).[82] At the same time, increases in the discount factor have, according to this decomposition, contributed negatively over the period, especially since late January 2018, when interest rates started to increase more substantially on the back of strengthening signs of rising inflation on a global scale. During this time, equity prices have often reacted more strongly to changes in interest rates than would normally have been implied by DDMs. The underlying economic reason for these reactions is a tug-of-war for equity prices between two mutually offsetting forces depicted in Chart 6: on the one hand, earnings expectations are still rising amid an ongoing economic expansion, warranting further price increases. On the other hand, market expectations of tightening monetary policy on the back of inflation normalisation and, therefore, higher bond yields depress the present value of future dividends – resulting in turn in lower equity valuations.

Chart 6

DDM decomposition of cumulative changes in euro area equity prices



Sources: Thomson Reuters and ECB calculations.
Note: The latest observations are for 13 April 2018.

[82] For an earlier version of this decomposition, see the Box entitled "Recent drivers of euro area equity prices", *Economic Bulletin*, Issue 5, ECB, 2017.

Box 1

Refinements to the three-stage dividend discount model: the role of earnings, share buy-backs and the yield curve

Prepared by André Geis, Daniel Kapp and Kristian Loft Kristiansen

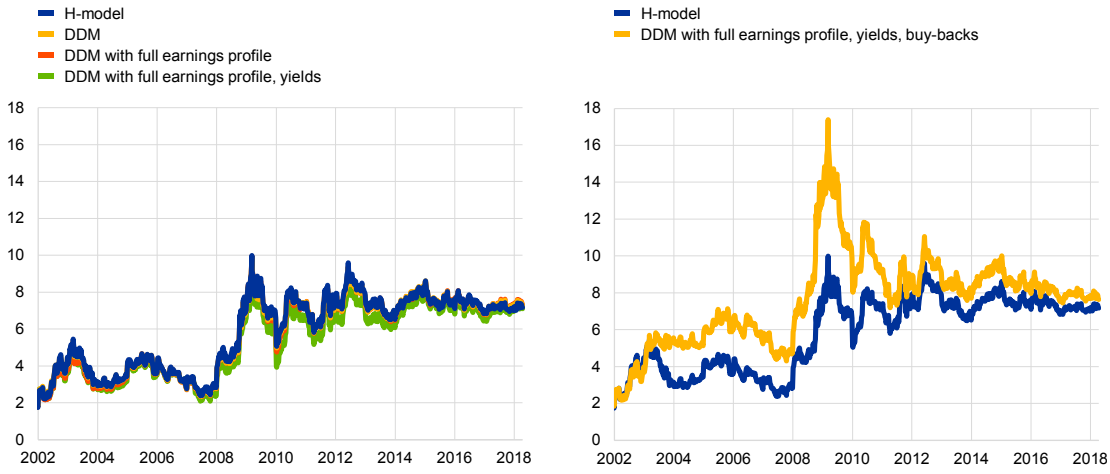
Although the dividend discount model (DDM) is often implemented by approximating via the H-model, refinements are possible, as demonstrated in this box.[83]

First, instead of solving the model via the H-model approximation as shown in the main text, a more demanding yet more precise approach is to find the implied equity risk premium (ERP) to minimise the difference between the model-implied equity price and the observed market price. Doing so has little impact on the level of the estimated ERP (see Chart A, left-hand side) and provides a basis for implementing three further changes.

Chart A

Changes in the ERP resulting from refinements to the three-stage DDM (H-model)

(percentages)



Sources: Thomson Reuters and ECB calculations.
Notes: The left-hand side chart shows the ERP resulting from the H-model approximation in comparison with the modifications to the DDM suggested in this box. The right-hand side chart compares the final resulting ERP from the DDM, including all modifications proposed in this box, with the H-model approximation. The latest observations are for 13 April 2018.

The second modification is based on the notion that very short-term earnings expectations should also be reflected in the DDM. In the three-stage DDM, earnings expectations were observed at only two points in time and interpolated between these two points. However, we now build a path of earnings expectations for the first five years by using both the one and five-year growth rates, thus effectively allowing for a larger share of price movements being driven by fluctuations in (shorter-term) earnings expectations. In the longer term, the assumption that

[83] For an implementation of the six-stage DDM, where several stages of shorter-term earnings are estimated from survey data, see Damodaran, A., "Equity Risk Premiums (ERP): Determinants, estimation and implication – the 2012 edition" in Roggi, Oliviero and Altman, Edward I. (eds.), *Managing and Measuring Risk: Emerging Global Standards and Regulations After the Financial Crisis*, 2013, pp. 343-455. Broadly comparable refinements in terms of including buy-backs and discounting earnings with appropriate maturities as with the ones proposed in this box have also recently been implemented by other central banks (see, for example, Dison, W. and Rattan, A., "An improved model for understanding equity prices", *Bank of England Quarterly Bulletin*, 2017 Q2 or "Stock market valuations – theoretical basics and enhancing the metrics", *Deutsche Bundesbank Monthly Report*, April 2016).

expected dividend growth converges to the expected nominal long-term growth rate of the economy remains intact.

Third, all expected future dividends should be discounted along the yield curve to match the discount factor with the respective timing of the expected payout. Specifically, we discount each of the first 10 years of future earnings with 1 to 10-year overnight index swap rates. Dividends 11 years ahead or later are discounted using the 15-year yield.

The impact of these refinements is very small (see Chart A, left-hand side). This however does not preclude the possibility that their impact might be relevant in the future. For example, if the yield curve were to steepen significantly, this would provide more vigour to the estimated results.

The impact on the estimated ERP is greater if payouts to shareholders, in addition to dividends, also include share buy-backs (see Chart A, right-hand side). Dividends make up the lion's share of payouts to shareholders in the euro area, accounting for 86% of all payouts in 2017. This number lies considerably lower in other jurisdictions, such as the United States. Although buy-backs are currently of secondary importance in the euro area, they constituted a larger part of total payouts prior to the financial crisis. As a result, estimates of the risk premium including share buy-backs reduce the size of the increase in the euro area ERP from the pre-crisis to the post-crisis period.

Although from a theoretical perspective it is important to include share buy-backs, doing so is relatively complex. In its original form, the DDM did not directly include share buy-backs because these did not play a large role, particularly as virtually all payouts to shareholders were in the form of dividends. Furthermore, in theory share buy-backs are of little significance, since they should be reflected in an increase in the value of future dividends to remaining shareholders. However, the data suggest that expected dividend growth estimates only account imperfectly for changes in share buy-backs.[84] Moreover, expected dividend growth appears to be a relatively poor estimate of the growth in share buy-backs. In fact, the data suggest that it would be sensible to assume that a firm's total payout to shareholders, be it in the form of dividends or share buy-backs, is a roughly constant fraction of earnings. Consequently, current observed dividends and share buy-backs in this model are assumed to grow in the short term with the expected growth rate of earnings, rather than dividends.

5 The ERP in the euro area and the United States

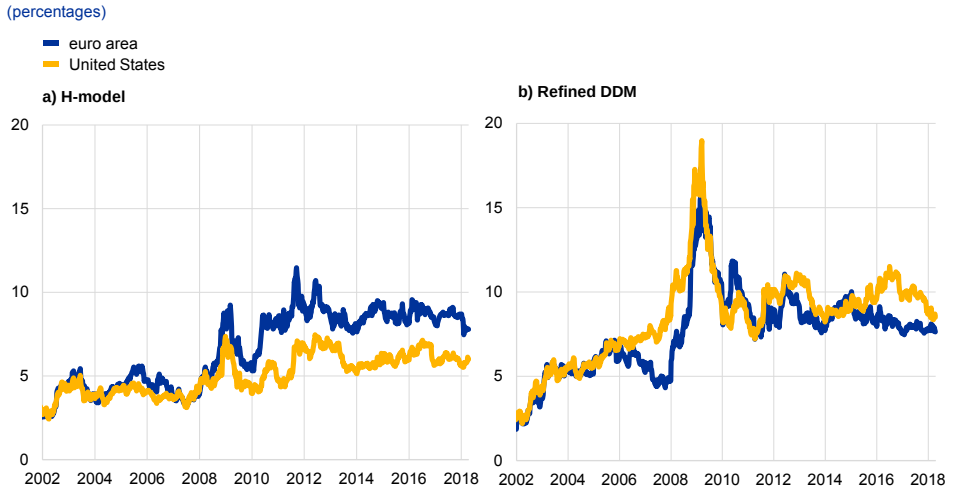
Turning to a comparison of developments in the ERP in the United States and the euro area, the H-model suggests they moved roughly in tandem prior to the financial crisis, and diverged afterwards (see Chart 7a). Since 2010 the H-model shows a gap opening up between the two locations, with the ERP much higher in the euro area than in the United States. However, as explained in Box 1, the H-model approximation does not include share buy-backs, which can be

[84] See, for example, Lamdin, Douglas J., "Handle with care: cost of equity estimation with the discounted dividend model when corporations repurchase", *Applied Financial Economics*, Vol. 11, Issue 5, 2001, pp. 483-487 and Stowe, John D., McLeavey, Dennis W. and Pinto, Jerald E., Share Repurchases and Stock Valuation Models, SSRN, 2007.

regarded as future income for equity holders, thus heavily underestimating the ERP should share buy-backs be substantial.

Chart 7

ERP estimates for the euro area and the United States using the H-model and the refined DDM



Sources: Thomson Reuters and ECB calculations.
Note: The latest observations are for 13 April 2018.

Estimating the ERP with the help of the refined model, which includes share buy-backs, leads to a somewhat different picture, highlighting the relevance of share buy-backs, particularly in US equity markets (see Chart 7b). Before the crisis, share buy-backs were common in the euro area and the United States, lifting the level of the ERP in both jurisdictions. Share buy-backs then declined during the financial crisis, and subsequently recovered much faster in the United States. When share buy-backs are included, an upward shift in the ERP can be observed for both jurisdictions (including for most of the post-crisis period). Since autumn 2016, when equity prices started their longest nearly uninterrupted rally to date, it is interesting to observe that the ERP in the United States has declined by around 4 percentage points, while that in the euro area has declined by around 2 percentage points.

Overall, it must be emphasised that the estimation, especially of the level of the ERP, remains subject to modelling and data uncertainties. The wide range of model and survey estimates of the ERP in the literature, as well as the changes in the ERP resulting from adjustments to the same class of models shown above, highlight this uncertainty. For example, while the euro area ERP is estimated to currently stand at around 8% according to the H-model, it stands somewhat below 7% according to the refined DDM. In addition, small changes in parameter assumptions, such as growth estimates, can result in relatively large changes in ERP levels. For this reason, most practitioners maintain a number of ERP models and place greater emphasis on dynamics, rather than level estimates.

6 Conclusions

Equity provides a substantial source of funding for euro area NFCs, rendering the cost of equity relevant from a monetary policy perspective. The cost of equity for euro area corporations, in comparison with the cost of debt, has stayed relatively high since the onset of the global financial crisis, underpinned by an elevated ERP.

However, quantifying the cost of equity is challenging. The suite of estimates presented in this article suggests that – even when considering the proposed model refinements – the level of the ERP still remains subject to considerable uncertainty. This advocates using a range of models for policy purposes and placing a stronger focus on the interpretation of the dynamics of the ERP. Improving upon existing modelling approaches for the cost of equity has value for policy purposes, as demonstrated by the comparison that this article draws of equity risk premia in the euro area and the United States. Indeed, a consideration of share buy-backs when estimating the cost of equity can account for some of the differences seen in the level and dynamics of equity risk premia across both jurisdictions.

3 Measures of underlying inflation for the euro area

Prepared by Michael Ehrmann, Gianluigi Ferrucci, Michele Lenza and Derry O'Brien

Headline inflation can be noisy, blurring the signal on the medium-term inflationary pressure relevant for monetary policy. To help distinguish signal from noise in the data, central banks monitor measures of underlying inflation. As there are many ways of measuring underlying inflation, it is important to understand the properties of the various indicators and what factors may account for any divergence between them. This article describes in detail the measures of underlying inflation typically used at the ECB and evaluates them against a set of empirical criteria.

1 Introduction

Central banks should be mainly concerned with persistent sources of inflationary pressure and less so with short-lived, reversible movements in the inflation rate. The price stability objective of the Eurosystem is to maintain annual rates of headline HICP (Harmonised Index of Consumer Prices) inflation at below, but close to, 2% over the medium term. As HICP inflation comprises a broad-based basket of goods and services, developments in the annual rate of HICP inflation may be temporarily influenced by factors that are mainly of a short-term nature. These factors can include price changes that stem from volatility in, for example, commodity prices, or price changes that are not determined by market forces, such as those in administered prices, as well as price changes that are specific to certain product markets. Such short-term changes may be looked through, in particular if they are not likely to lead to second-round effects.

The central bank faces the problem of distinguishing in real time the "signal" on medium-term inflationary pressure contained in the HICP inflation data from the "noise" stemming from temporary or idiosyncratic factors. To this end, measures of underlying inflation are routinely monitored. Generally, their purpose is to obtain an estimate of where headline inflation will settle in the medium term after temporary factors have vanished. This is conceptually akin to estimating the evolution of the (unobservable) persistent component of headline inflation, which will be simply referred to in what follows as "trend inflation".[85] Operationally, this estimation can be performed at various levels of statistical complexity, ranging from excluding some components of headline inflation a priori on account of their volatility, through taking simple moving averages of headline inflation, to estimating complex statistical models that exploit the cross-sectional variation of inflation components. Underlying inflation measures can provide intermediate verifiable milestones, together with a broader set of macroeconomic information, to assess medium-term inflationary pressure. In practice, as any measure of underlying inflation is inherently

[85] In what follows, the persistent component of inflation is simply defined as "trend inflation", although different concepts of trend inflation exist. For example, over the longer term, trend inflation can be seen as reflecting the quantitative inflation objective and the credibility of the central bank in achieving it.

surrounded by a large degree of uncertainty, for the purposes of robustness central banks use a wide range of measures (see Box 1).

The assessment of developments in measures of underlying inflation requires an appreciation of their respective properties and needs to be followed up by an examination of the economic forces driving inflation. Alternative measures of underlying inflation may provide conflicting signals, as has been the case over recent years. This brings back into focus the need to review their relative properties, on the basis of both conceptual and empirical criteria. It is also worth stressing that the measures of underlying inflation provide only a first-pass, often only statistical-based, perspective on medium-term inflationary pressure. A conjunctural assessment of developments in measures of underlying inflation needs to be followed up by an examination of the driving forces in order to better understand the inflation process, but this is beyond the scope of this article.[86]

Against this background, this article discusses the measures of underlying inflation used at the ECB and evaluates their properties against a set of empirical criteria. To extract an overall assessment that can support policymakers, it is not enough to just compare developments in alternative indicators: one must also clearly understand their properties under different macroeconomic circumstances and benchmark them against a well-defined set of metrics. To this end, Section 2 describes the conceptual properties of the measures of underlying inflation typically used at the ECB and Section 3 evaluates these measures against a set of empirical criteria. Section 4 concludes.

Box 1
The use of measures of underlying inflation at selected central banks

Prepared by Gianluigi Ferrucci

Central banks typically formulate their price stability objectives in terms of headline inflation. This mostly follows welfare considerations. It is the preservation of the purchasing power of the currency, as measured by the most representative and comprehensive price index, that matters for consumers. While they may capture the broad inflation trends, measures of underlying inflation do not represent the cost of living and, as such, they may not be readily accepted by the public as an objective of monetary policy. For the selected central banks shown in Table A, the inflation aim is generally defined in terms of headline CPI (Consumer Price Index) inflation. However, the US Federal Reserve focuses on Personal Consumption Expenditure (PCE) inflation, which is an index covering a wide range of household spending, while Sveriges Riksbank recently adopted a CPI measure that excludes the effects of changes in household mortgage rates (the CPIF).[87] Table A shows that most advanced economies' central banks have a 2% aim for headline

[86] For recent evidence on the drivers of inflation, see for example the article entitled "Domestic and global drivers of inflation in the euro area", *Economic Bulletin*, Issue 4, ECB, 2017.

[87] In September 2017 Sveriges Riksbank adopted the CPIF as its inflation target variable. The CPIF is based on the CPI, but excludes the effects of changes to mortgage rates. The change was motivated by the fact that household mortgage costs change in lockstep with the official interest rate and therefore their inclusion in the CPI caused a part of the inflation target measure to be positively correlated with the policy instrument. Indeed, Sveriges Riksbank had been using the CPIF as a de facto operational target variable for several years before it became the formal target variable for monetary policy.

inflation, with the Reserve Bank of Australia and the Reserve Bank of New Zealand having target ranges.

Table A

Price stability objectives and measures of underlying inflation of selected central banks

Central bank	Price stability measure	Price stability quantification	Measures of underlying inflation typically monitored
European Central Bank	HICP	Year-on-year increase in the HICP for the euro area of below, but close to, 2% over the medium term	Range of exclusion-based measures, trimmed means, weighted median and two frequency exclusion measures (Persistent and Common Component of Inflation (PCCI) and Supercore)
Federal Reserve	PCE	Annual percentage change in the total PCE deflator at 2% over the longer run	Official publications mainly refer to exclusion-based measures, but trimmed means, weighted median and factor model are also used
Bank of Japan	CPI	Annual percentage change in the total CPI at 2%	Diffusion index, trimmed mean, mode and weighted median officially released by the Bank of Japan two days after the release of the monthly CPI for Japan
Bank of England	CPI	Annual percentage change in the total CPI of 2%. Deviations greater than ±1% trigger an open letter (this is not a target range)	Various exclusion-based measures monitored and occasionally discussed in official publications
Bank of Canada	CPI	Annual percentage change in the total CPI at 2%, the mid-point of the target range of 1-3%, over the medium term	Three preferred measures regularly monitored: trimmed mean, median and a tracker of common price changes across categories in the CPI basket
Sveriges Riksbank	CPI with fixed interest rate (CPIF)	Annual percentage change in the CPIF around 2%, with a variation band of 1-3%	Range of exclusion-based measures, trimmed means, weighted median, volatility-weighted measures and factors from principal component analysis monitored and occasionally presented in official communication
Norges Bank	CPI	Annual percentage change in the CPI of close to 2% in the medium term	Range of exclusion-based measures, trimmed means and weighted median regularly monitored and reported in official publications. Projections are also produced for these indicators
Reserve Bank of Australia	CPI	Achieve an inflation rate of 2-3%, on average, over time	Trimmed mean, weighted mean and CPI excluding volatile items (fruit, vegetables and automotive fuel) regularly published on the bank's website
Reserve Bank of New Zealand	CPI	Future CPI inflation outcome between 1% and 3% on average over the medium term, with a focus on keeping future average inflation near the 2% mid-point	Factor model, trimmed means, and variance-adjusted and exclusion-based measures

Sources: Central bank websites; *FOMC statement of longer-run goals and policy strategy*, press release, Federal Reserve, 25 January 2012; *The "Price Stability Target" under the Framework for the Conduct of Monetary Policy*, Bank of Japan, 22 January 2013; *Monetary policy remit: Autumn Budget 2017*, HM Treasury, 22 November 2017; *Renewal of the Inflation-Control Target – Background Information*, Bank of Canada, October 2016*; 2016 Statement on the Conduct of Monetary Policy*, Reserve Bank of Australia and Australian Government, 19 September 2016; and *Policy Targets Agreement 2018*, Reserve Bank of New Zealand and Ministry of Finance, 26 March 2018. The classification in the last column partly follows Table 1 in Kahn, M., Morel, L. and Sabourin, P., "A comprehensive assessment of measures of core inflation for Canada", Bank of Canada Discussion Paper 2015-12, 2015.

Measures of underlying inflation, which abstract from short-term volatility, are typically monitored by central banks to gauge trends in inflation and the likely evolution of inflation in the medium term. While the emphasis on individual measures of underlying inflation tends to change over time, the most commonly used measures are those that exclude the components with more volatile price movements (see Table A), possibly because they are easier to replicate and communicate to the public. Measures based on trimmed means and weighted medians are also fairly commonly used, whereas model-based measures, such as those derived from factor models and principal component analysis, tend to be referred to less often in central banks' official communication.

The specific measures of underlying inflation that are used tend to vary across different central banks. The Federal Reserve, for example, regularly monitors core inflation, in particular the PCE price index excluding food and energy, as a measure providing a better indication than the

headline figure of where overall inflation will be in the future.[88] The Bank of Japan looks at four measures of underlying inflation, obtained by removing transitory disturbances from the actual movements observed in consumer prices, as a way to identify trends in price movements.[89] The Bank of England has recently discussed various exclusion-based measures of inflation as approximations for domestically generated inflationary pressure.[90] The Bank of Canada explicitly uses three measures of core inflation as "operational guides" to achieve the total CPI inflation target, but not as a replacement for it.[91] Norges Bank monitors a range of (mostly exclusion-based) measures as a way to look through temporary variations in inflation. For these measures, it also produces forecasts over the policy-relevant horizon. All central banks interpret the various measures of underlying inflation in conjunction with other available information about broader economic developments.

Measures of underlying inflation are referred to in the official communication of central banks. Based on a textual analysis of the official policy statements issued by the Federal Open Market Committee (FOMC) of the Federal Reserve and the Governing Council of the ECB between October 1998 and March 2018, Chart A displays the number of times that expressions related to underlying inflation appear in the official policy statements of the two institutions. Both seem to make low to moderate use of the concept in their official communication, with the ECB referring to it, on aggregate, slightly more often than the Federal Reserve, even when accounting for the higher number of policy statements issued during the period (218 introductory statements for the ECB and 165 statements for the FOMC). Looking at the occurrence of different expressions conveying the notion of underlying inflation, Chart A shows that the ECB typically refers to "underlying inflation" and "underlying price pressure", while terms like "inflation trend" and "core inflation" recur more frequently in the communication of the Federal Reserve.

88 See *Monetary Policy Report*, Federal Reserve Board, July 2017.

89 See "Performance of Core Indicators of Japan's Consumer Price Index", *Bank of Japan Review*, 2015-E-7.

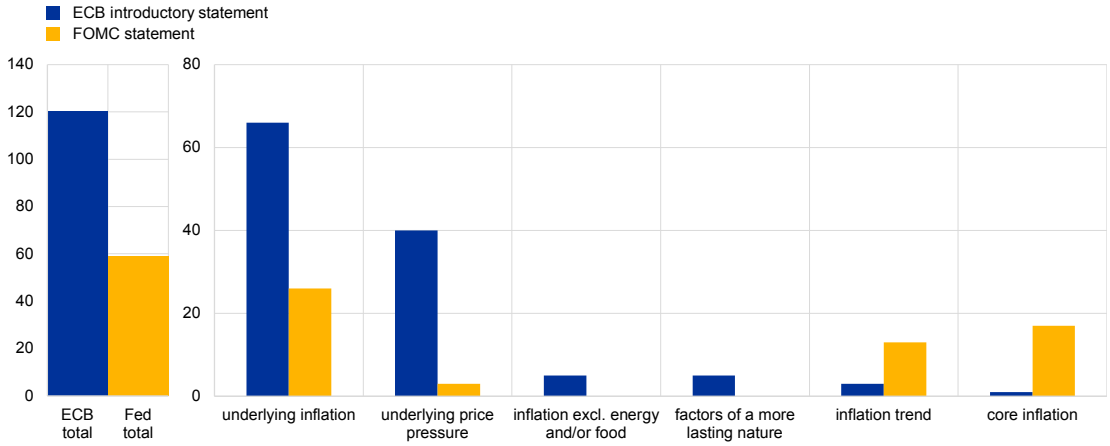
90 See the May 2017 and August 2017 Bank of England Inflation Reports.

91 See *Renewal of the inflation-control target: Background information*, Bank of Canada, October 2017.

Chart A

References to underlying inflation terms in the official communication of the ECB and the Federal Reserve

(number of occurrences)



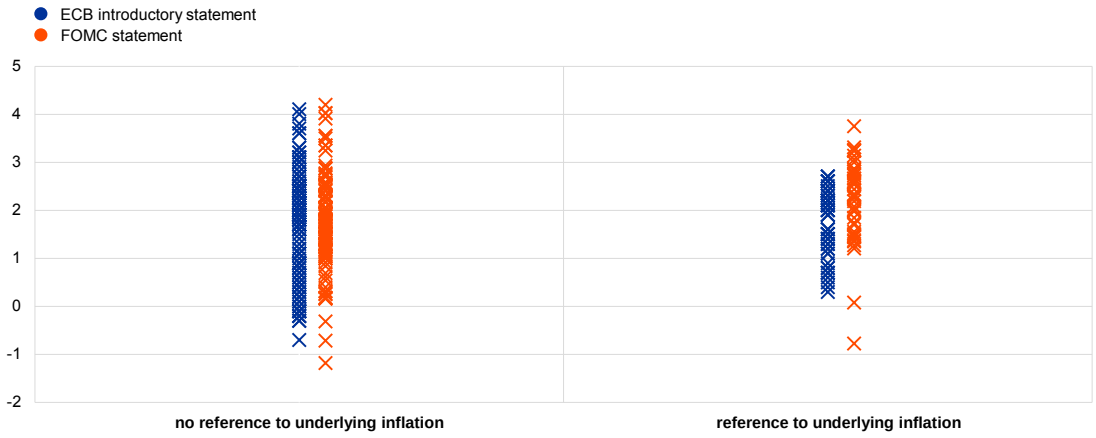
Source: ECB calculations.
Notes: The period covered is October 1998 to March 2018. The two bars on the left-hand side refer to the total number of references and equal the sum of all categories on the right-hand side. The sample includes 218 ECB introductory statements and 165 FOMC statements.

As a further step, it is interesting to see whether the use of the concept of underlying inflation in central bank communication displays any regularity, for example appearing more frequently in periods during which price developments are not aligned with the inflation aims of the central banks. Chart B provides tentative evidence that the ECB and the Federal Reserve have referred to underlying inflation both in times of high and low headline inflation, with the ECB using the concept slightly more often when inflation is low and the Federal Reserve when inflation is high. Neither central bank seems to make more intensive use of the concept during episodes of significant deviations of headline inflation from their respective inflation aims.

Chart B

Headline inflation and references to underlying inflation in the official communication of the ECB and the Federal Reserve

(annual percentage changes)



Sources: Federal Reserve Bank of St. Louis, Eurostat and ECB calculations.
Notes: The y-axis shows the annual percentage change in headline HICP inflation for the ECB and in US PCE inflation for the Federal Reserve. The period covered is October 1998 to March 2018.

2 Measures of underlying inflation

There are many ways to measure underlying inflation.[92] Although quite diverse methods are used in their construction, measures of underlying inflation generally have the common aim to filter out the short-term volatility in headline inflation in order to capture the low-frequency component of inflation in a timely manner. The measures of underlying inflation typically used at the ECB can be sub-divided into three broad categories: permanent exclusion measures, temporary exclusion measures, and frequency exclusion measures. This section describes the conceptual nature of and the methodologies behind these measures, taking each category in turn. In particular, the rationale behind the measures is highlighted, while the desirable empirical properties, such as smoothness and the ability to track trend inflation, are evaluated in the next section.

The first class of measures permanently removes certain volatile sub-components. Volatility in headline inflation can sometimes be attributable to temporary factors that have little relevance for the medium-term outlook. For example, oil prices often exhibit large swings that can produce, over the short term, substantial direct effects on energy prices. Similarly, unseasonal weather can sometimes induce strong volatility in unprocessed food prices. To abstract from such volatility, HICP inflation excluding energy and food (HICPX) is often used as a measure of underlying inflation. However, the HICPX inflation rate can still reflect the influence of substantial transitory effects, as was evidenced during the spring of 2017 when Easter-related calendar effects were behind large fluctuations in the annual HICPX inflation rate (see Chart 1). In addition, the price signal for clothing and footwear may be unduly influenced by the timing of the sales periods. To abstract from these factors, the inflation rate for HICPX excluding travel-related items, clothing and footwear is also tracked at the ECB.[93,94] During 2017 there was a notable but temporary divergence between this measure and HICPX, which was mainly attributable to the impact of higher inflation for the volatile travel-related items sub-component.[95]

92 See also Box 1 on measures of underlying inflation used at selected central banks.

93 Travel-related items comprise air fares, package holidays and accommodation services.

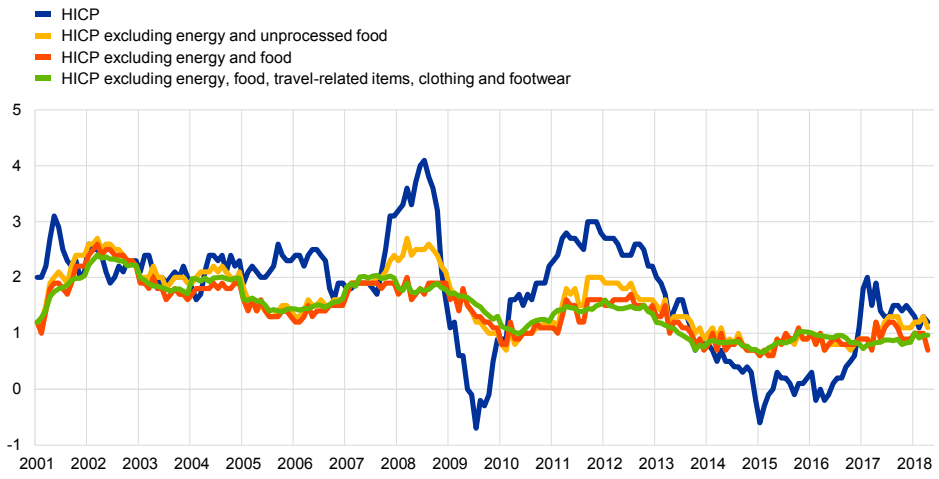
94 Changes in indirect taxes or administered prices tend to be one-off effects that have little relevance for medium-term inflation. To this end, measures of inflation that exclude indirect taxes and/or administered prices are also assessed, although not on a routine basis. See, for example, the box entitled "Measuring and assessing the impact of administered prices on HICP inflation", *Monthly Bulletin*, ECB, May 2007.

95 HICPX excluding travel-related items, clothing and footwear accounts for about 60% of the HICP basket, while HICPX accounts for about 71% of the HICP basket.

Chart 1

Exclusion-based measures of underlying inflation

(annual percentage changes)



Sources: Eurostat and ECB calculations.
Note: The latest observations are for April 2018.

The sub-components that exhibit high volatility also tend to be those that are less persistent. The implicit assumption underlying standard exclusion-based measures is that minimising volatility will help to isolate the more persistent movements in inflation. However, high volatility and low persistence do not necessarily go hand in hand.[96] A cross-check of volatility against some standard metrics of persistence generally supports the assumption that the excluded sub-components are also characterised by lower persistence (see Chart 2).[97] For example, large sub-components of energy inflation, such as fuels for transport equipment, are highly volatile and less persistent. Unprocessed food inflation also tends to be relatively less persistent. Inflation for air fares, package holidays and garments is somewhat more volatile but also clearly less persistent, supporting the exclusion of such items from a measure of underlying inflation. However, for other items, such as accommodation services and processed food, the case for exclusion is less clear-cut while, as expected, services inflation is overall smooth and highly persistent.[98]

96 For an illustration of why high volatility may not always be associated with low persistence, see also Bilke, L. and Stracca, L., "A persistence weighted measure of core inflation in the euro area", *Economic Modelling*, Vol. 24, 2007, pp. 1031-1047.

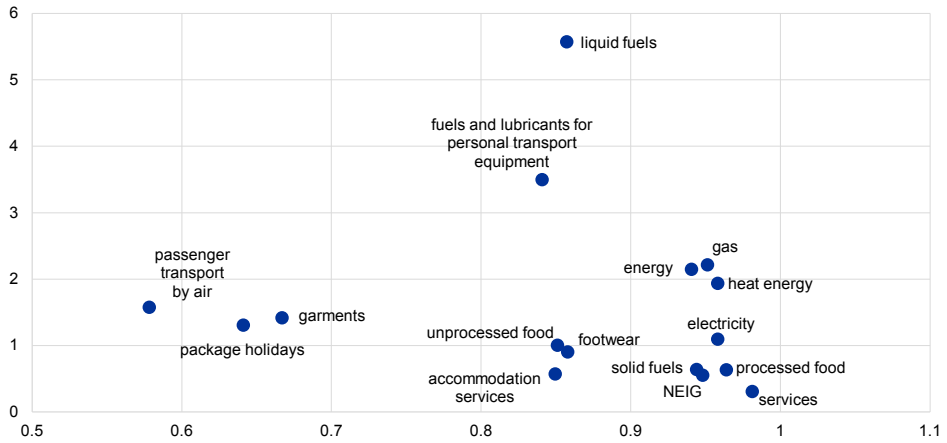
97 The analysis is based on annual inflation rates. The ordering of the sub-components in terms of both volatility and persistence remains broadly similar when seasonally adjusted month-on-month inflation rates are examined.

98 It is worth keeping in mind that the persistence of services inflation is higher than that of individual series partly because the aggregation can help to wash out idiosyncratic effects.

Chart 2

Persistence and volatility of sub-components of inflation

(x-axis: persistence; y-axis: volatility)



Sources: Eurostat and ECB calculations.
Notes: Volatility is measured by the coefficient of variation, which scales the standard deviation by the mean of the series. Persistence is measured as the sum of the autoregressive coefficients where the optimal lags are chosen according to the Schwarz information criterion. Alternatively, persistence can be measured non-parametrically according to the number of times inflation crosses its mean. The results for both approaches are broadly similar. The estimation sample covers the period from January 2000 to April 2018. NEIG is non-energy industrial goods.

A second class of measures excludes items on a temporary basis (see Chart 3). The headline HICP index is a weighted average of 93 sub-component indices.[99] However, the distribution of the 93 price changes in the HICP is periodically asymmetric and/or affected by strong outliers (see Charts 4 and 5). During these periods, trimmed means and a weighted median may be more precise estimators of inflation developments in a given month than the weighted mean used in headline inflation.[100] In comparison to the first class of measures, the second class has the advantage of being able to abstract from large one-off price changes in items that are typically non-volatile. These measures can also give an indication of how broad-based the movements in inflation are. For example, during the summer of 2017, the trimmed means and median were relatively stable in contrast to headline inflation. However, while the cross-sectional distributional aspect of trimmed mean measures evidently helps to reduce volatility, it is less clear whether this necessarily translates into stronger persistence and an improved measure of medium-term inflationary pressure.

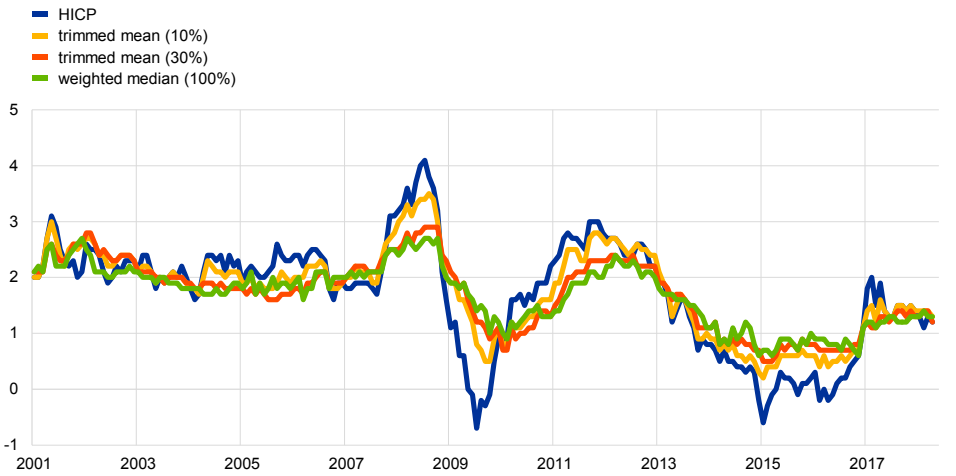
99 For more background, see Glossary: COICOP HICP on the Eurostat website.

100 The 10% (30%) trimmed mean removes 5% (15%) of the annual rates of change from each tail of the distribution of 93 price changes in the HICP each month and aggregates the annual rates of change using rescaled weights. The (weighted) median is an extreme form of the trimmed mean as it trims all but the (weight-based) mid-point of the distribution of price changes. See also Silver, M., "Core inflation: Measurement and statistical issues in choosing among alternative measures", 2007.

Chart 3

HICP inflation and temporary exclusion measures of underlying inflation

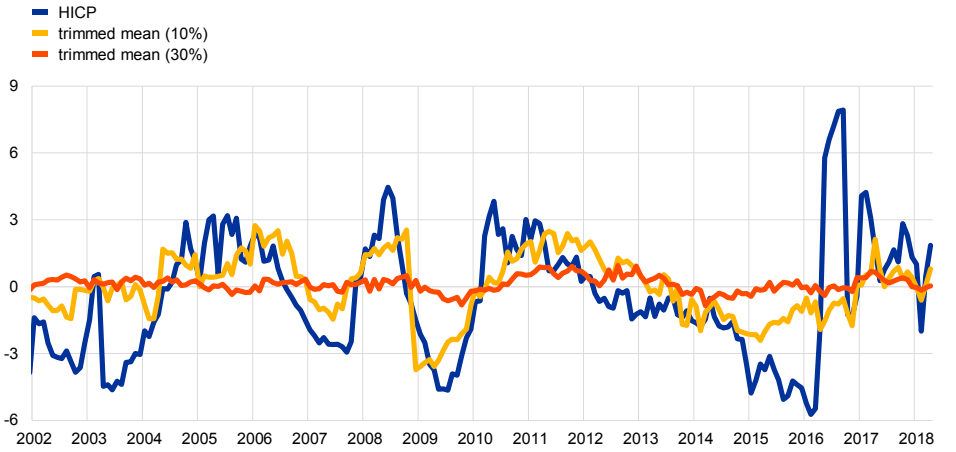
(annual percentage changes)



Sources: Eurostat and ECB calculations.
Note: The latest observations are for April 2018.

Chart 4

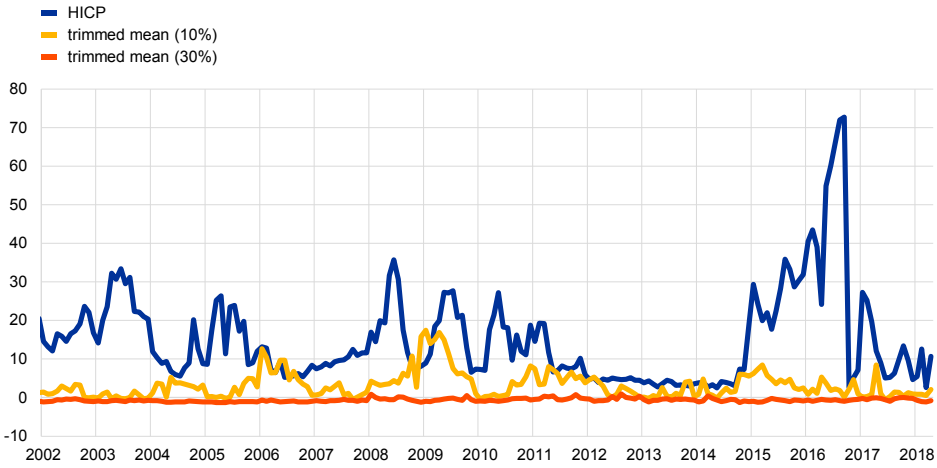
Skewness of HICP inflation



Sources: Eurostat and ECB calculations.
Notes: The skewness of a normal distribution is zero. The skewness is computed each month for a sample with 93 HICP items and across the changing items remaining in the trimmed means. The measure refers to the adjusted Fisher-Pearson standardised moment coefficient. The latest observations are for April 2018.

Chart 5

Kurtosis of HICP inflation



Sources: Eurostat and ECB calculations.
Notes: The kurtosis of a normal distribution is three. The kurtosis is computed each month for a sample with 93 HICP items and across the changing items remaining in the trimmed means. The latest observations are for April 2018.

Temporary exclusion measures can be somewhat less amenable to interpretation. The fact that the set of items excluded from such measures can vary from one month to the next can make interpretation challenging at times. Still, in practice, many of the items excluded from, for example, the 10% trimmed mean tend to be energy items, reflecting the impact of large swings in oil prices.[101] The measures have also tended, particularly during periods of higher inflation, to exclude telecommunication services, which have recorded large persistently negative rates of inflation. So, in addition to highly volatile items and short-lived outliers, these indicators may also exclude items that have undergone sector-specific long-lasting declines.

The third class of measures takes a frequency exclusion approach. The general idea of these measures is that each sub-item of consumer prices may be driven by both transitory and persistent shocks. Hence, rather than excluding some items a priori, it may be more appropriate to filter out the transitory component using econometric techniques and retain the persistent component(s) of all items. One of the frequency exclusion measures routinely monitored at the ECB is referred to as "Supercore". Box 2 describes in detail how the measure is derived. Here it should be noted that Supercore picks out those items that are estimated to co-move with the business cycle.[102] This approach has some intuitive appeal, particularly as it goes beyond purely statistical criteria and establishes a macroeconomic link to domestic drivers of inflationary pressure. In particular, Supercore should provide a useful gauge of underlying domestic inflationary pressure as it likely excludes items that are

101 See also the box entitled "The role of seasonality and outliers in HICP inflation excluding food and energy", *Economic Bulletin*, Issue 2, ECB, 2018.

102 Notice that the Supercore measure could also be classified as a temporary exclusion measure because, as opposed to excluding HICPX items a priori, it excludes some items on the basis that they are estimated not to be very related to domestic business cycle fluctuations. However, it is better understood as a frequency exclusion measure as, among HICPX items, it picks out those that are more correlated with the business cycle.

frequently affected by one-off changes (e.g. administered prices), extremely volatile or heavily influenced by external macroeconomic conditions. It can also be helpful to identify those items that do not appear to be affected by the business cycle as these items may at times share some common patterns or properties that may explain why inflation is not responding to its main domestic driving factors such as slack or inflation expectations.

Box 2
The Supercore measure of underlying inflation

Prepared by Derry O'Brien

The Supercore goes beyond a purely statistical basis by making an explicit link to macroeconomic conditions.[103] Specifically, the Supercore index is based only on those items of HICP inflation excluding energy and food (HICPX) that are deemed sensitive to slack, as measured by the output gap. Notably, the estimated coefficient of the output gap is generally higher and more significant in a reduced-form Phillips curve regression based on the Supercore in comparison with, for example, the corresponding coefficients based on the permanent exclusion measures (see Table A).

Table A
Phillips curve regressions on Supercore and permanent exclusion measures of underlying inflation

	Output gap coefficient	P-values
HICP	0.04	0.040
HICP excluding energy	0.02	0.002
HICP excluding energy and unprocessed food	0.02	0.002
HICP excluding energy and food	0.02	0.000
HICP excluding energy, food, travel-related items, clothing and footwear	0.02	0.001
Supercore	0.04	0.000

Sources: Eurostat and ECB calculations.
Note: The sample period is Q1 2002 (Q2 2002 for Supercore) to Q1 2018.

An item is assessed as being sensitive to the output gap if the inclusion of the output gap improves the out-of-sample forecast performance for that item, according to the procedure described below, relative to an AR(1) model.

The methodology is implemented in the following steps. First, for each of the 72 items of HICPX, three Phillips curve (PC) specifications are estimated which include the output gap as a measure of slack lagged by one quarter, two quarters or both. For example, the specification for the Phillips curve for item i with one lag is as follows:

[103] See the box entitled "The responsiveness of HICP items to changes in economic slack", *Monthly Bulletin*, ECB, September 2014. This was an earlier version of Supercore that selected HICPX items for inclusion if the coefficient of the output gap had an economically meaningful sign and a statistically significant coefficient in a Phillips curve equation. This approach is more straightforward to implement, but may suffer from omitted variable bias and tends to select relatively few items. An equation similar to the one presented in the above-mentioned box was previously estimated by the Deutsche Bundesbank for the same purpose: see Fröhling and Lommatzsch, "Output sensitivity of inflation in the euro area: indirect evidence from disaggregated consumer prices", *Discussion Paper Series 1: Economic Studies*, No 25, Deutsche Bundesbank, 2011.

$y_{i,t} = \alpha + \rho * y_{i,t-1} + \beta_{1,i} * \text{output gap}_{t-1} + \varepsilon_t$

where $y_{i,t}$ is the annualised seasonally adjusted quarter-on-quarter growth rate of item i. Forecasts for each item are calculated for horizons of one to four quarters ahead. The forecasts are estimated conditional on the path of the output gap over the forecast horizon. The corresponding AR(1) benchmark model is also estimated for each item. The sample period starts in Q1 1996 and ends in Q1 2018.

Second, for each item, the root mean squared forecast error (RMSFE) is calculated as the average over one to four quarters ahead. This is repeated for 30 estimation samples and the average RMSFE (ARMSFE) is calculated across the samples. For example, when the full data sample ends in Q1 2018, the first estimation sample starts in Q1 1998 and ends in Q4 2009, and the second sample starts in Q1 1998 and ends in Q1 2010, and this process continues until the final estimation sample starts in Q1 1998 and ends in Q1 2017.

Third, the ARMSFE of the three alternative PC specifications is compared with the AR(1) ARMSFE and, if one of the PC specifications improves on the latter, then the item is included in the Supercore. The latest available vintage of the output gap series is used in the estimations for each sample in a given run.

In the final step, the items deemed suitable for inclusion are aggregated using rescaled HICP weights. The Supercore index is reported as a three-month moving average of its annual rate. This final step helps to lessen the chances of a false positive signal when assessing turning points.

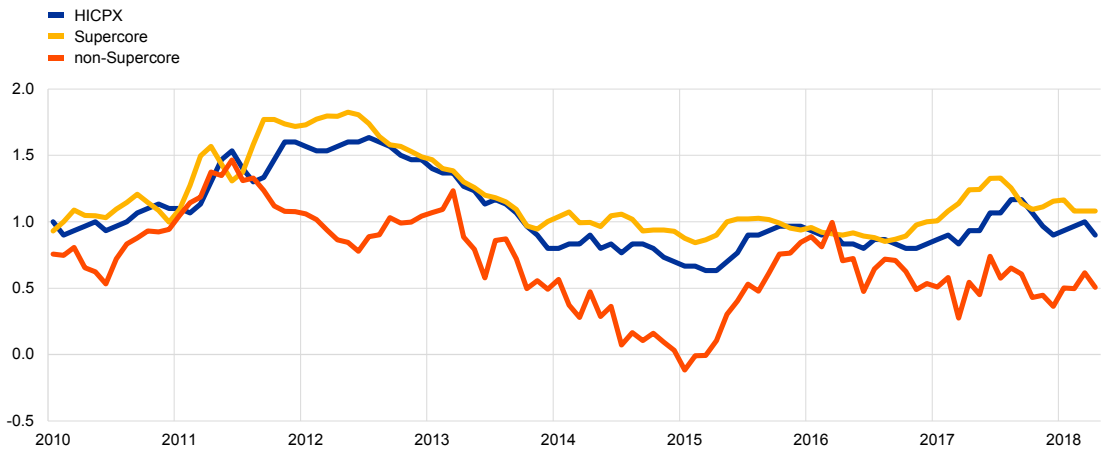
It is worth noting that the Supercore series may be revised over time because of: (i) a change in the selection of items; (ii) possible changes in the relationship of the different items with the output gap (captured by the expanding window methodology); and (iii) the sometimes very large revisions in the estimates of the output gap. In practice, the set of items selected for inclusion in Supercore tends to change only gradually over time and so the revisions to the Supercore series from one iteration to the next are generally quite modest.

Tracking the behaviour of an index comprising those items that do not appear in the Supercore can also be instructive. The Supercore and non-Supercore series occasionally co-move (see Chart A). However, in early 2015, there was a sharp increase in the annual rates of the non-Supercore, which was an important driver behind the moderate upward trend in HICPX during that period. Also, more recently, there was a sharp fall in the non-Supercore in early 2017, which weighed on HICPX during 2017.

Chart A

HICPX, Supercore and non-Supercore

(three-month moving averages of annual percentage changes)



Sources: Eurostat and ECB calculations.
Notes: There are 47 HICP items in the latest vintage of Supercore. The latest observations are for April 2018.

Further along the spectrum of econometric complexity is another frequency-based measure referred to as the Persistent and Common Component of Inflation (PCCI), which filters out and averages the medium-term component of the HICP components of individual euro area countries. The PCCI captures the common and persistent component in inflation rates across countries and items (see Box 3). It is designed to signal developments in headline inflation, and in particular turning points, with some lead. As it also includes information on energy and food items, unlike some other measures of underlying inflation, it is important to assess to what extent changes in the PCCI are driven by energy and food components and to what extent they are driven by HICPX components. The PCCI, being based on a rather complex econometric model with many layers of filtering and averaging, presents challenges in interpretation. These are compensated for by the fact that it can be especially useful when several idiosyncratic shocks across countries and items also affect items that are normally not volatile.

Box 3

The Persistent and Common Component of Inflation (PCCI) measure of underlying inflation

Prepared by Mario Porqueddu

The PCCI is a frequency exclusion measure of underlying inflation that uses time-series smoothing and exploits cross-sectional information across items and countries. It is designed to capture the persistent and common component of inflation rates across euro area countries and sub-items. The common component is estimated with a generalised dynamic factor

model, in line with what has been previously proposed in the literature for the euro area[104] and also for a similar indicator for the United States.[105]

The indicator is constructed as follows: around 1,000 HICP sub-items from 12 euro area countries are collected and are seasonally adjusted, expressed in terms of annualised month-on-month rates (calculated as log-differences) and standardised to have a mean of zero and a standard deviation of one. The low-frequency common component for each sub-item is estimated with the generalised dynamic factor model. This requires the choice of a set of parameters, in particular the number of dynamic factors, the number of static factors and the threshold for the minimum length of cycles allowed in the common component. The PCCI excludes all cycles with a length shorter than three years.[106] In order to reduce the uncertainty about the number of factors, the common component for each sub-item is an average of 81 estimates obtained for different combinations of dynamic (from two to eight) and static (from four to 16) factors. The resulting low-frequency common components are resized using the mean and the standard deviation estimated in the first step and are smoothed with a three-month moving average.[107]

The PCCI is finally obtained by aggregating all the low-frequency common components using the weights of the single items in the total HICP. A similar aggregate, which is referred to as PCCIx, can be obtained for a sub-component, such as the HICP excluding energy and food, by aggregating only items which are part of this sub-component, or other aggregates can be calculated for any combination of sub-components and countries.

The main advantage compared with exclusion measures, such as HICPX, is that the PCCI also includes the impact of medium-term shocks affecting food and energy, to the extent that they have common effects, and, at the same time, it excludes short-term fluctuations in prices that are considered as "core" in the traditional exclusion measures (such as services prices). In general, the PCCI is a flexible indicator whose estimates depend on the set of variables included and the threshold of the highest frequency allowed, so that a practitioner may decide to reduce the persistence of the indicator by reducing the threshold to cycles with a length of more than one year, or to exclude food and energy shocks.

Chart A shows the PCCI estimate of underlying inflation for headline HICP inflation as described above, together with headline annual inflation and the measure of trend inflation defined as the centred moving average with a length of two years as proposed in Section 3. Compared with both measures, the PCCI is less volatile and less affected by large temporary shocks, such as the ones affecting energy prices that explain the negative inflation rates registered in 2009, 2015 and 2016. Chart B shows the same indicator obtained by aggregating only the common persistent components of items which are included in the HICPX index, i.e. excluding

104 Cristadoro, R., Forni, M., Reichlin, L. and Veronese, G., "A core inflation indicator for the euro area", *Journal of Money, Credit and Banking*, Vol. 37, 2005, pp. 539-560. The PCCI differs from this core inflation indicator because it excludes cycles with a length shorter than three years, while the above-cited article excluded only cycles with a length of one year. The set of variables used for the estimation only includes HICP sub-items and the average of the estimates obtained using different numbers of static and dynamic factors is used. For an application of this methodology to aggregate euro area data, see Lenza, M., "Revisiting the information content of core inflation", *Research Bulletin*, Vol. 14, ECB, 2011, pp. 11-13.

105 "The FRBNY Staff Underlying Inflation Gauge: UIG", Federal Reserve Bank of New York Staff Report No 672, April 2014.

106 The profile of the PCCI is also similar when excluding only cycles with a length shorter than two years.

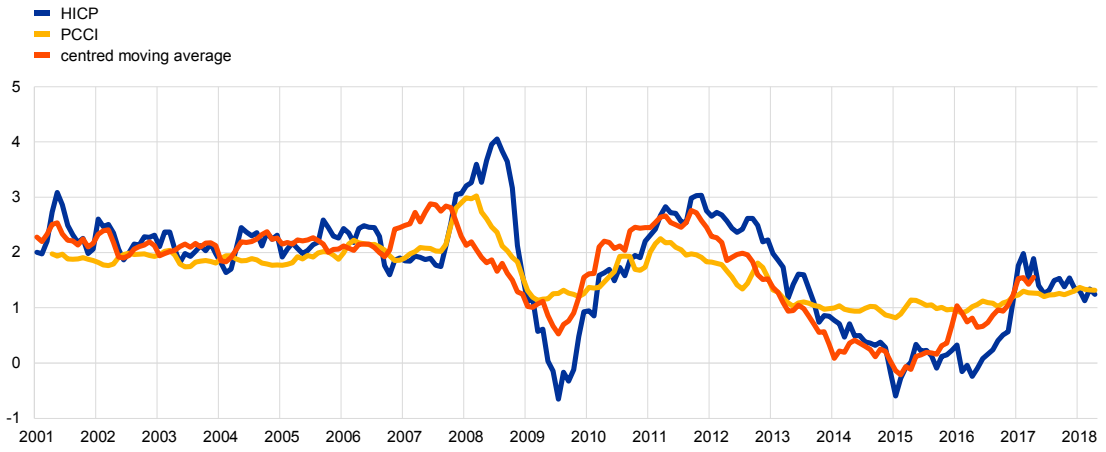
107 As explained for Supercore, this final step helps to lessen the chances of a false positive signal when assessing turning points.

energy and food items. Naturally, this narrower PCCIx index is also less volatile and less affected by short-term movements than HICPX. In both cases, the PCCI indicators can anticipate peaks of annual inflation, but with a lag compared with the centred two-year moving averages. However, when considering how policymakers would look at underlying inflation indicators, it is important to consider that centred moving averages are not available in real time, as they use observations from the future.

Chart A

Headline inflation and the PCCI for headline HICP inflation

(annual percentage changes)

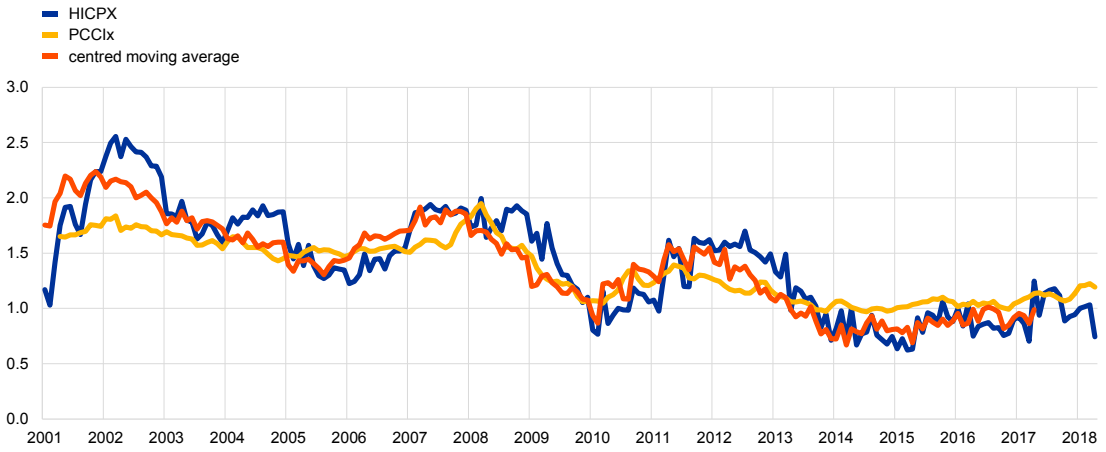


Sources: Eurostat and ECB calculations.
Note: The latest observations are for April 2018.

Chart B

HICPX and PCCIx for items included in the HICPX index

(annual percentage changes)



Sources: Eurostat and ECB calculations.
Note: The latest observations are for April 2018.

3 Empirical evaluation of the measures of underlying inflation

An empirical assessment can help to discriminate between the different measures of underlying inflation. Measures of underlying inflation should track the evolution of medium-term headline inflation. While this implies a challenge, as one wants to track an unobservable quantity, an assessment of the properties of the measures can be conducted based on a number of empirical criteria. These include volatility, coincidence, unbiasedness and overall precision.[108] Also, as the relative performance of a measure may be episodic, it is important to assess the measures over different periods of time.

An estimate of the persistent component of inflation is needed to assess the measures of underlying inflation. Trend inflation is an unobservable variable and its estimation is surrounded by high uncertainty. As a very rough proxy for trend inflation, this article uses a 24-month centred moving average of monthly inflation, which should be sufficiently long to smooth out high-frequency fluctuations, yet short enough to reflect the horizon at which monetary policy operates over the business cycle.[109] Given that constructing this measure requires the use of future values of inflation, it has limited conjunctural use, but it can serve as a benchmark to assess other indicators.

Most measures of underlying inflation successfully filter out the volatility in headline inflation. The standard deviation, a crude measure of volatility, is generally significantly lower for the measures of underlying inflation than for the headline HICP inflation rate. The HICPX, HICPX excluding travel-related items, clothing and footwear, PCCI and Supercore measures tend to have comparatively low volatility (see Table 1). However, there is a trade-off between volatility and information content: for example, an index that is constant over time would have no volatility but would not capture any dynamics in trend inflation. This trade-off highlights why the assessment must be based on a set of criteria rather than on one criterion in isolation.

[108] See, for example, the box entitled "Are sub-indices of the HICP measures of underlying inflation?", *Monthly Bulletin*, ECB, December 2013.

[109] All the results presented in this section are qualitatively robust to the adoption of a 36-month moving average.

Table 1

Standard deviations of measures of underlying inflation

	January 2000-April 2018	July 2007-April 2018
HICP	0.95	1.12
HICP excluding energy and unprocessed food	0.55	0.53
HICP excluding energy and food	0.46	0.38
HICP excluding energy, food, travel-related items, clothing and footwear	0.47	0.38
Trimmed mean (10%)	0.75	0.88
Trimmed mean (30%)	0.62	0.68
Weighted median (100%)	0.53	0.58
Supercore	n.a.	0.52
PCCI	0.47	0.48

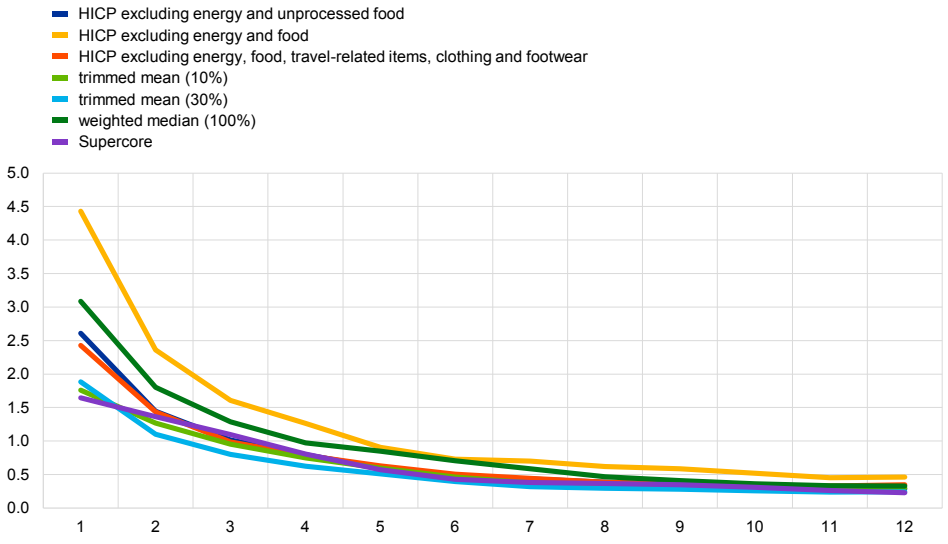
Sources: Eurostat and ECB calculations.

Yet, measures of underlying inflation still exhibit volatility, making it challenging to determine whether a cyclical turning point has occurred. One way to investigate this more formally is to apply a measure typically used for assessing the business cycle, the "months for cyclical dominance" (MCD) measure. The MCD measure gives the number of months it takes on average for the signal from the cyclical component of a series to dominate the noise of the series (for the construction of the MCD measure, see the notes to Chart 6). Looking at the MCD for the underlying inflation measures that do not already explicitly embed a filter, the HICPX tends to be noisier and can take relatively longer before the cyclical signal dominates (see Chart 6).

Chart 6

Noise-to-signal ratios for the measures of underlying inflation

(x-axis: number of months; y-axis: ratio of the volatility of changes in the irregular component to the volatility of changes in the cyclical component)



Sources: Eurostat and ECB calculations.
Notes: The PCCI is not included as it already explicitly embeds a filter. The construction of the MCD measure involves several steps. For each measure of underlying inflation, the cyclical and error (noise) components of the year-on-year rates of inflation are first estimated using a fixed-length symmetric Baxter-King band-pass filter. Then, the following are calculated across lags of one to 12 months: (i) the standard deviation of the changes in the cyclical component (this should increase, the longer the lag); and (ii) the standard deviation of the changes in the irregular component (this should be broadly the same across lags). The MCD is the monthly lag for which the ratio of (ii) to (i) begins to be substantially lower than one (the threshold is set at 0.7). It can then be said that the change in the series between month t and month t-MCD would normally be in large part due to a cyclical movement. If the value of the measure of underlying inflation in month t is higher (lower) than its value in month t-MCD, this suggests an upswing (downswing). In general, the smoother the series in its raw form, the lower the MCD tends to be. Based on a sample from January 2000 (March 2003 for Supercore) to April 2018.

The measures of underlying inflation are biased to varying degrees, suggesting that none of the measures is entirely successful in isolating the more permanent component. The measures of underlying inflation should demonstrate a close coherence with the in-sample persistent component of the HICP inflation trend.[110] If a measure does not capture well the latter, then its long-term average may diverge from that of headline inflation. The standard core measures (e.g. HICPX) tend to have a negative bias (pointing to lower than realised inflation over the whole period), partly reflecting that energy inflation has been relatively high on average over the sample period (see Table 2). In contrast, the more model-based measures (e.g. the PCCI and Supercore) tend to have a positive bias. In the case of Supercore, this may reflect that services items, which tend to have a higher inflation rate on average over time than non-energy industrial goods items, are more often selected as they tend to have a stronger link with the domestic business cycle. The bias of the trimmed means is relatively small over the full sample.

[110] In this exercise, the proxy for trend inflation is defined as the annualised moving average of HICP inflation for two years centred at time t, i.e. it is equal to $1{,}200*(p_{t+h} - p_{t-h})/(2*h)$ where h is 12 months.

Table 2

In-sample accuracy of measures of underlying inflation

(percentage points)

	HICP excluding energy and food	HICP excluding energy and unprocessed food	HICP excluding energy, food, travel-related items, clothing and footwear	Trimmed mean (10%)	Trimmed mean (30%)	Weighted median (100%)	PCCI	Supercore
RMSE, January 2000-April 2018	0.70	0.67	0.69	0.56	0.58	0.58	0.55	
Bias, January 2000-April 2018	-0.32	-0.19	-0.30	0.06	0.00	-0.02	0.17	
RMSE, July 2007-April 2018	0.70	0.68	0.68	0.67	0.68	0.67	0.69	0.96
Bias, July 2007-April 2018	-0.14	-0.01	-0.12	0.21	0.17	0.17	0.32	0.11

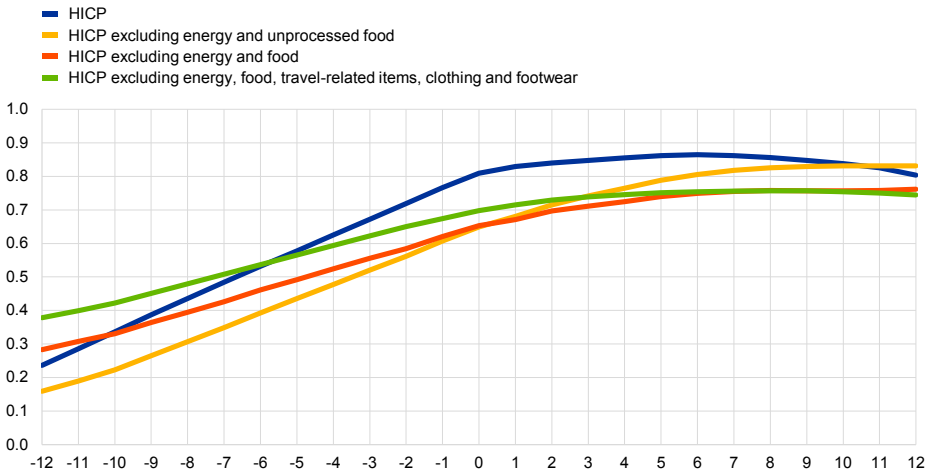
Sources: Eurostat and ECB calculations.
Notes: The RMSE is computed by evaluating the error incurred by each of the different measures at each specific time t to capture the inflation trend at time t. All measures of underlying inflation are computed in "real time", i.e. by considering only the information that would be available to the forecaster at time t. For example, in the case of Supercore, real-time vintages of the output gap are used.

The performance of the measures of underlying inflation in tracking the persistent component of headline inflation is episodic. The root mean squared error (RMSE) can be decomposed into two components, one due to the bias and another due to the ability of an index to track the month-on-month dynamics in the target variable. Over the full sample, the PCCI and the trimmed means tend to perform best in tracking the benchmark two-year moving average of inflation. In the case of the trimmed means, this partly reflects their relatively low bias. Notably, HICP inflation excluding energy and food performs relatively poorly. However, over the more recent period, the measures of underlying inflation generally have a broadly similar performance, with the exception of Supercore, which tends to have a somewhat higher RMSE.

Measures of underlying inflation tend to lag the benchmark. Coincidence, which is measured by the correlation of headline inflation and the measures of underlying inflation at various leads and lags with the two-year centred moving average of monthly inflation, can help to assess whether the measures provide a timely signal about inflationary pressure. Generally, the measures exhibit a lagging behaviour with respect to the benchmark (see Charts 7 and 8), which suggests that it may be challenging for these measures to accurately track the future development of the inflation trend. This can also be gauged with a more formal analysis of the out-of-sample predictive ability of the different measures.

Chart 7

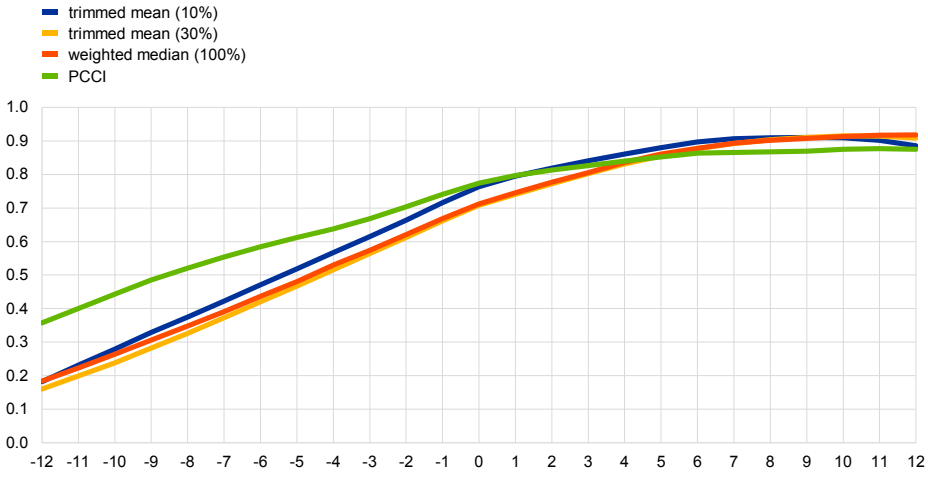
Correlations of permanent exclusion measures with the two-year moving average of HICP inflation at 12 leads and lags



Sources: Eurostat and ECB calculations.
Notes: The sample period is January 2000 to April 2018. The x-axis indicates the number of lags for the permanent exclusion measures of underlying inflation, while the y-axis shows their correlation with the two-year centred moving average.

Chart 8

Correlations of temporary and frequency exclusion measures with the two-year moving average of HICP inflation at 12 leads and lags



Sources: Eurostat and ECB calculations.
Notes: The sample period is January 2000 to April 2018. The Supercore measure is not included as vintages only begin in 2007. The x-axis indicates the number of lags for the temporary or frequency exclusion measures of underlying inflation, while the y-axis shows their correlation with the two-year centred moving average.

The predictive accuracy of the measures of underlying inflation varies strongly over time (see Table 3). The out-of-sample ability of the measures of underlying inflation to track the future development of the benchmark varies over the assessment sample.[111] According to statistical tests, the bias is not significantly

[111] The trend inflation target in month t is defined as the annualised HICP growth rate over the subsequent two years, i.e. it is equal to $1{,}200*(p_{t+H} - p_t)/H$ where H is 24 months.

different from zero[112] for any of the measures over the full sample or the shorter sample.[113] Concerning more generally the significance of the differences in forecast accuracy across different measures, the HICP excluding energy and food is taken as a benchmark. While in the full sample the differences across measures turn out to be insignificant, in the shorter sample the trimmed means and the Supercore perform significantly worse than the HICPX.[114] However, it should be stressed that the relative performances of all measures tend to vary considerably over different sub-samples, suggesting that a range of measures should be monitored. It is also worth noting that combining all the measures into one composite index is not likely to be a much better solution to analysing the range; for example, all the measures of underlying inflation show a positive bias over the past decade which is even magnified in the more recent part of the decade, suggesting that an average of many measures would not have a much better performance.

Table 3

Out-of-sample accuracy of measures of underlying inflation

(percentage points)

	HICP excluding energy and food	HICP excluding energy and unprocessed food	HICP excluding energy, food, travel-related items, clothing and footwear	Trimmed mean (10%)	Trimmed mean (30%)	Weighted median (100%)	PCCI	Supercore
RMSE, January 2000-April 2018	0.84	0.90	0.78	1.00	0.92	0.87	0.79	
Bias, January 2000-April 2018	-0.25	-0.12	-0.23	0.15	0.08	0.06	0.24	
RMSE, July 2007-April 2018	0.87	1.01	0.79	1.29	1.26	1.08	1.04	1.08
Bias, July 2007-April 2018	0.01	0.16	0.03	0.39	0.35	0.35	0.49	0.28

Sources: Eurostat and ECB calculations.
Notes: All measures of underlying inflation are computed in "real time", i.e. by considering only the information that would be available to the forecaster at time t. See also the notes to Table 2. For example, in the case of Supercore, real-time vintages of the output gap are used.

Measures of underlying inflation should also satisfy some practical criteria. Firstly, they should be available on a timely basis. Some of the measures (e.g. the HICP excluding energy, food, travel-related items, clothing and footwear, the PCCI and Supercore) can only be constructed when the full release of monthly data is available, which is generally about two weeks after the flash release. Also, the measures should ideally not be subject to data revision. Most of the measures are not revised but there are some notable exceptions. In particular, the PCCI series can be revised because the seasonal adjustment of the underlying data produces revisions over the whole sample with the introduction of each new observation. The Supercore series is revised not only as the seasonally adjusted series change, but

[112] For all the tests carried out in this section, 5% is the level considered to gauge statistical significance.

[113] The significance of the bias terms is assessed by means of a t-test with heteroskedasticity and autocorrelation consistent standard errors.

[114] A Diebold-Mariano test, again accounting for heteroskedasticity and autocorrelation consistent standard errors, is used to determine whether one measure performed statistically better than the HICP excluding energy and food.

also on account of the output gap series being revised over time (often quite substantially) and of the shifting out-of-sample forecast horizon.

It is also helpful if the measures of underlying inflation are sufficiently transparent that they can be easily communicated to the public. Developments in permanent exclusion measures can be easier to communicate as any divergence from headline inflation can be attributed to certain sub-components (e.g. energy). It can be somewhat more challenging in the case of temporary exclusion measures as, at any given point in time, it may be necessary to identify which items are excluded and explain if and how their outlying behaviour reflects the influence of temporary phenomena. The Supercore and the PCCI measures are based on statistical methodologies, which poses more communication challenges. Also, the results can sometimes be challenging to interpret. Overall, while some measures may have performed relatively well in tracking the benchmark inflation (e.g. the PCCI over certain periods), they may come with the downside of being more challenging to explain to the public.

Overall, there is no single measure that emerges as optimal across all criteria. The relative performance of the measures tends to be episodic. As individually the measures may not consistently give very precise or reliable signals, this calls for monitoring a wide range of measures of underlying inflation.

4 Conclusions

Measures of underlying inflation offer different perspectives and insights that together can be helpful in understanding developments in headline inflation. Tracking developments in HICPX is useful during periods when there are large and temporary swings in energy and food prices. HICPX excluding travel-related items, clothing and footwear becomes very relevant when calendar effects are prominent. Indicators that exclude outliers can also at times play a useful complementary role. The Supercore indicator goes further by excluding those items that are estimated to be insensitive to domestic real economic conditions. Still, every item in the HICP is driven to some extent by permanent factors, albeit to a relatively small degree in some cases, and these items can contain useful information about underlying inflationary pressure. The PCCI dynamic factor model tries to exploit this by capturing the persistent component across all items of the HICP and across several euro area countries.

Empirical results suggest that no one measure of underlying inflation is superior in all situations as the performance of the indicators varies over time. In practice, each indicator comes with merits and shortcomings, which calls for monitoring the full range of measures of underlying inflation. Generally, measures of underlying inflation are only a first pass at quantifying underlying inflationary pressure over the medium term. They need to be complemented by a more structural examination of the driving forces in order to better understand the inflation process.

Statistics

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5 Money and credit	S 18
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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
2015	3.5	2.9	2.3	1.4	6.9	2.1	0.6	1.7	0.1	0.0	0.8	1.4	0.0
2016	3.2	1.5	1.9	1.0	6.7	1.8	1.1	1.8	1.3	0.7	-0.1	2.0	0.2
2017	3.8	2.3	1.8	1.7	6.8	2.4	2.3	1.8	2.1	2.7	0.5	1.6	1.5
2017 Q2	1.0	0.8	0.2	0.5	1.8	0.7	2.1	1.8	1.9	2.7	0.4	1.4	1.5
Q3	1.0	0.8	0.5	0.5	1.8	0.7	2.2	1.8	2.0	2.8	0.6	1.6	1.4
Q4	1.0	0.7	0.4	0.3	1.6	0.7	2.3	1.9	2.1	3.0	0.6	1.8	1.4
2018 Q1	0.9	0.5	0.1	-0.2	1.4	0.4	2.2	1.9	2.2	.	1.3	2.2	1.3
2017 Dec.	-	-	-	-	-	-	2.3	1.9	2.1	3.0	1.0	1.8	1.4
2018 Jan.	-	-	-	-	-	-	2.2	1.8	2.1	3.0	1.4	1.5	1.3
Feb.	-	-	-	-	-	-	2.2	1.9	2.2	2.7	1.5	2.9	1.1
Mar.	-	-	-	-	-	-	2.3	2.0	2.4	2.5	1.1	2.1	1.3
Apr.	-	-	-	-	-	-	.	.	2.5	2.4	0.6	1.8	1.2
May [3]	-	-	-	-	-	-	.	.	2.8	2.4	.	.	1.9

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
2015	53.1	55.8	56.2	51.4	50.4	53.8	51.8	53.7	50.4	1.1	3.6	-0.4
2016	51.6	52.4	53.4	50.5	51.4	53.3	51.8	52.0	50.2	1.1	1.2	1.0
2017	53.3	54.3	54.7	52.5	51.8	56.4	53.9	53.8	52.8	5.4	3.1	6.9
2017 Q2	53.1	53.6	54.8	53.0	51.3	56.6	52.5	53.3	51.6	0.2	1.5	-0.6
Q3	53.3	54.9	54.1	51.8	51.9	56.0	52.7	53.5	51.9	1.4	1.0	1.6
Q4	53.4	54.6	55.2	52.6	51.9	57.2	53.5	53.4	52.1	1.5	1.7	1.4
2018 Q1	53.6	54.6	53.4	52.1	53.0	57.0	53.8	53.5	52.2	2.5	0.8	3.6
2017 Dec.	53.4	54.1	54.9	52.2	53.0	58.1	54.2	53.1	52.5	1.5	1.7	1.4
2018 Jan.	53.5	53.8	53.4	52.8	53.7	58.8	54.5	53.2	53.2	3.0	2.8	3.1
Feb.	54.3	55.8	54.5	52.2	53.3	57.1	53.8	54.5	52.3	2.9	2.5	3.2
Mar.	52.8	54.2	52.4	51.3	51.8	55.2	52.9	52.8	51.2	2.5	0.8	3.6
Apr.	53.6	54.9	53.2	53.1	52.3	55.1	53.5	53.6	50.3	.	.	.
May	54.1	56.6	54.5	51.7	52.3	54.1	52.8	54.4	50.2	.	.	.

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
2015	-0.11	-0.07	-0.02	0.05	0.17	0.32	0.09
2016	-0.32	-0.34	-0.26	-0.17	-0.03	0.74	-0.02
2017	-0.35	-0.37	-0.33	-0.26	-0.15	1.26	-0.02
2017 Nov.	-0.35	-0.37	-0.33	-0.27	-0.19	1.43	-0.03
Dec.	-0.34	-0.37	-0.33	-0.27	-0.19	1.60	-0.02
2018 Jan.	-0.36	-0.37	-0.33	-0.27	-0.19	1.73	-0.03
Feb.	-0.36	-0.37	-0.33	-0.27	-0.19	1.87	-0.06
Mar.	-0.36	-0.37	-0.33	-0.27	-0.19	2.17	-0.05
Apr.	-0.37	-0.37	-0.33	-0.27	-0.19	2.35	-0.04
May	-0.36	-0.37	-0.33	-0.27	-0.19	2.34	-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
2015	-0.45	-0.40	-0.35	0.02	0.77	1.17	1.66	1.68	-0.35	-0.22	0.82	1.98
2016	-0.93	-0.82	-0.80	-0.47	0.26	1.08	1.63	1.17	-0.78	-0.75	0.35	1.35
2017	-0.78	-0.74	-0.64	-0.17	0.52	1.26	0.67	0.83	-0.66	-0.39	0.66	1.56
2017 Nov.	-0.78	-0.76	-0.70	-0.28	0.44	1.20	0.79	0.88	-0.73	-0.52	0.56	1.52
Dec.	-0.78	-0.74	-0.64	-0.17	0.52	1.26	0.67	0.83	-0.66	-0.39	0.66	1.56
2018 Jan.	-0.63	-0.64	-0.52	0.05	0.71	1.35	0.81	1.07	-0.59	-0.21	0.96	1.60
Feb.	-0.66	-0.68	-0.57	0.01	0.71	1.39	0.80	0.81	-0.64	-0.26	0.96	1.65
Mar.	-0.67	-0.70	-0.61	-0.10	0.55	1.25	0.65	0.61	-0.67	-0.35	0.75	1.47
Apr.	-0.63	-0.66	-0.57	-0.04	0.63	1.29	0.72	0.73	-0.63	-0.30	0.85	1.56
May	-0.63	-0.72	-0.69	-0.25	0.40	1.12	0.63	0.73	-0.76	-0.52	0.57	1.34

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
2015	356.2	3,444.1	717.4	261.9	628.2	299.9	189.8	500.6	373.2	278.0	377.7	821.3	2,061.1	19,203.8
2016	321.6	3,003.7	620.7	250.9	600.1	278.9	148.7	496.0	375.8	248.6	326.9	770.9	2,094.7	16,920.5
2017	376.9	3,491.0	757.3	268.6	690.4	307.9	182.3	605.5	468.4	272.7	339.2	876.3	2,449.1	20,209.0
2017 Nov.	391.7	3,601.4	802.3	269.2	727.7	315.4	188.3	640.6	508.6	294.8	317.3	854.9	2,593.6	22,525.1
Dec.	389.7	3,564.7	796.2	274.9	719.0	313.5	189.1	641.2	491.3	291.3	316.1	839.7	2,664.3	22,769.9
2018 Jan.	398.4	3,612.2	822.3	276.1	731.7	323.4	196.3	661.2	504.6	284.9	312.6	848.1	2,789.8	23,712.2
Feb.	380.6	3,426.7	783.7	264.7	703.6	306.9	190.1	629.7	488.3	263.2	291.3	792.0	2,705.2	21,991.7
Mar.	375.9	3,374.3	769.1	258.0	699.7	308.0	183.6	622.9	498.9	268.9	292.0	775.6	2,702.8	21,395.5
Apr.	383.3	3,457.6	772.6	260.7	724.8	331.3	185.5	627.7	496.3	281.3	302.6	789.1	2,653.6	21,868.8
May	392.3	3,537.1	806.4	272.3	735.3	351.0	182.5	653.1	527.3	287.9	302.6	819.1	2,701.5	22,590.1

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
2017 May	0.05	0.46	0.39	0.81	6.32	16.70	5.09	5.78	6.22	2.46	1.73	1.90	1.90	1.87	2.23	1.87
June	0.05	0.46	0.38	0.77	6.30	16.82	4.68	5.74	6.19	2.43	1.69	1.89	1.91	1.89	2.22	1.87
July	0.05	0.45	0.38	0.76	6.26	16.81	4.95	5.84	6.28	2.38	1.75	1.91	1.90	1.90	2.22	1.88
Aug.	0.05	0.44	0.35	0.75	6.24	16.80	5.32	5.89	6.34	2.38	1.75	2.00	1.92	1.94	2.21	1.91
Sep.	0.05	0.44	0.35	0.74	6.27	16.80	5.07	5.71	6.21	2.37	1.70	1.93	1.96	1.96	2.20	1.89
Oct.	0.05	0.44	0.35	0.75	6.23	16.80	4.94	5.68	6.16	2.43	1.68	1.91	1.93	1.96	2.18	1.88
Nov.	0.04	0.44	0.33	0.75	6.21	16.80	4.73	5.69	6.14	2.38	1.67	1.92	1.95	1.94	2.16	1.87
Dec.	0.04	0.44	0.34	0.73	6.09	16.84	4.47	5.39	5.80	2.31	1.69	1.86	1.92	1.87	2.15	1.83
2018 Jan.	0.04	0.44	0.36	0.69	6.16	16.90	5.02	5.83	6.28	2.30	1.67	1.86	1.91	1.90	2.14	1.84
Feb.	0.04	0.44	0.34	0.69	6.20	16.86	4.72	5.70	6.19	2.36	1.64	1.88	1.93	1.91	2.14	1.84
Mar.	0.04	0.45	0.35	0.67	6.14	16.87	4.71	5.57	6.05	2.34	1.64	1.85	1.95	1.91	2.15	1.84
Apr. [(p)]	0.04	0.45	0.34	0.61	6.10	16.76	4.91	5.67	6.14	2.36	1.62	1.85	1.96	1.89	2.13	1.83

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
2017 May	0.05	0.10	0.43	2.52	2.49	2.77	2.40	1.76	1.74	1.76	1.20	1.47	1.64	1.76
June	0.04	0.06	0.43	2.51	2.46	2.68	2.36	1.74	1.72	1.71	1.27	1.43	1.56	1.76
July	0.04	0.11	0.35	2.45	2.45	2.76	2.38	1.75	1.75	1.76	1.23	1.34	1.67	1.74
Aug.	0.04	0.10	0.36	2.44	2.49	2.71	2.43	1.74	1.79	1.82	1.24	1.44	1.59	1.75
Sep.	0.04	0.07	0.44	2.43	2.44	2.73	2.41	1.71	1.69	1.77	1.19	1.47	1.59	1.73
Oct.	0.04	0.11	0.40	2.40	2.39	2.69	2.38	1.70	1.66	1.73	1.23	1.35	1.61	1.73
Nov.	0.04	0.08	0.30	2.36	2.43	2.61	2.37	1.71	1.62	1.72	1.23	1.33	1.57	1.71
Dec.	0.04	0.06	0.32	2.36	2.40	2.46	2.31	1.70	1.67	1.71	1.34	1.28	1.53	1.71
2018 Jan.	0.04	0.05	0.39	2.35	2.39	2.51	2.33	1.65	1.61	1.72	1.12	1.37	1.60	1.67
Feb.	0.04	0.09	0.42	2.36	2.37	2.48	2.33	1.66	1.62	1.74	1.18	1.34	1.63	1.70
Mar.	0.04	0.08	0.40	2.33	2.42	2.53	2.34	1.67	1.61	1.70	1.26	1.39	1.66	1.73
Apr. [(p)]	0.03	0.06	0.34	2.34	2.36	2.42	2.33	1.68	1.61	1.74	1.23	1.29	1.65	1.70

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														
2015	1,269	517	147	.	62	478	65	347	161	37	.	33	82	34
2016	1,241	518	136	.	59	466	62	349	161	45	.	31	79	33
2017	1,240	519	155	.	70	438	57	368	167	55	.	37	79	31
2017 Nov.	1,281	527	153	.	81	460	61	354	159	48	.	34	87	25
Dec.	1,240	519	155	.	70	438	57	305	139	51	.	30	55	29
2018 Jan.	1,270	532	153	.	77	447	61	400	195	38	.	41	91	36
Feb.	1,276	540	148	.	80	444	65	351	172	38	.	34	78	30
Mar.	1,284	541	140	.	84	453	67	378	167	53	.	41	84	33
Apr.	1,300	539	150	.	93	450	69	391	177	49	.	43	73	49
Long-term														
2015	15,249	3,786	3,285	.	1,060	6,481	637	216	68	46	.	13	80	9
2016	15,397	3,695	3,233	.	1,186	6,643	641	219	62	53	.	18	78	8
2017	15,352	3,560	3,140	.	1,190	6,819	642	248	66	75	.	17	83	7
2017 Nov.	15,373	3,594	3,129	.	1,188	6,819	643	227	55	64	.	23	77	8
Dec.	15,352	3,560	3,140	.	1,190	6,819	642	212	46	93	.	14	52	6
2018 Jan.	15,369	3,569	3,149	.	1,174	6,841	636	302	99	75	.	14	109	5
Feb.	15,375	3,566	3,144	.	1,171	6,864	629	216	57	52	.	12	88	7
Mar.	15,442	3,580	3,151	.	1,183	6,904	624	285	68	89	.	24	96	7
Apr.	15,434	3,581	3,158	.	1,187	6,884	624	227	60	64	.	14	85	4

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											
2015	16,518.3	4,303.1	3,431.9	.	1,122.0	6,958.9	702.4	6,814.4	584.3	985.3	5,244.9
2016	16,638.4	4,212.9	3,368.4	.	1,245.5	7,108.1	703.5	7,089.5	537.6	1,097.8	5,454.1
2017	16,591.6	4,079.1	3,295.3	.	1,260.1	7,257.3	699.8	7,954.8	613.6	1,261.9	6,079.3
2017 Nov.	16,654.7	4,120.6	3,282.4	.	1,268.4	7,279.8	703.5	8,001.5	638.4	1,248.2	6,114.8
Dec.	16,591.6	4,079.1	3,295.3	.	1,260.1	7,257.3	699.8	7,954.8	613.6	1,261.9	6,079.3
2018 Jan.	16,639.3	4,101.8	3,301.9	.	1,250.8	7,287.7	697.1	8,204.1	666.7	1,332.0	6,205.4
Feb.	16,650.6	4,106.3	3,292.1	.	1,251.5	7,307.4	693.4	7,920.3	639.8	1,291.9	5,988.6
Mar.	16,725.7	4,120.9	3,290.6	.	1,267.7	7,356.1	690.5	7,814.0	600.0	1,252.3	5,961.7
Apr.	16,734.4	4,119.1	3,308.0	.	1,280.4	7,334.0	692.8	8,141.4	621.0	1,351.3	6,169.1
Growth rate											
2015	0.3	-7.0	5.7	.	4.9	1.8	0.6	1.1	4.2	1.6	0.6
2016	0.3	-3.0	-1.6	.	7.6	2.2	-0.1	0.5	1.2	0.9	0.4
2017	1.3	-0.5	0.0	.	6.3	2.2	0.5	1.1	6.1	2.8	0.3
2017 Nov.	1.1	-0.7	-0.2	.	6.5	1.9	0.4	1.0	6.1	2.8	0.1
Dec.	1.3	-0.5	0.0	.	6.3	2.2	0.5	1.1	6.1	2.8	0.3
2018 Jan.	1.2	-0.4	0.2	.	5.9	1.9	0.5	1.1	5.8	2.7	0.3
Feb.	1.3	-1.0	1.2	.	5.6	2.3	-0.8	0.9	3.1	2.8	0.4
Mar.	1.5	-0.1	1.9	.	6.0	2.0	-2.7	1.0	1.5	3.6	0.4
Apr.	1.5	0.4	0.9	.	5.9	2.0	-0.8	1.3	1.5	5.4	0.5

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
2015	91.7	87.6	88.6	82.8	80.9	88.4	105.7	87.0
2016	94.4	89.5	90.9	84.9	80.1	89.4	109.7	88.9
2017	96.6	91.4	92.0	85.9	79.9	90.1	112.0	90.0
2017 Q2	95.3	90.2	91.0	84.8	78.8	89.0	110.1	88.5
Q3	98.6	93.2	93.8	87.7	80.7	91.7	114.5	91.8
Q4	98.6	93.2	93.5	87.5	80.5	91.5	115.0	92.0
2018 Q1	99.6	94.0	94.4	.	.	.	117.0	93.4
2017 Dec.	98.8	93.3	93.6	-	-	-	115.3	92.1
2018 Jan.	99.4	93.9	94.4	-	-	-	116.1	92.7
Feb.	99.6	93.9	94.4	-	-	-	117.3	93.6
Mar.	99.7	94.2	94.5	-	-	-	117.7	93.9
Apr.	99.5	93.9	94.0	-	-	-	117.9	93.9
May	98.1	92.9	92.6	-	-	-	116.6	93.2
Percentage change versus previous month								
2018 May	-1.4	-1.1	-1.5	-	-	-	-1.1	-0.8
Percentage change versus previous year								
2018 May	2.6	2.6	1.3	-	-	-	5.6	4.9

Source: ECB.

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

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

2.9 Bilateral exchange rates

(period averages; units of national currency per euro)

	Chinese renminbi	Croatian kuna	Czech koruna	Danish krone	Hungarian forint	Japanese yen	Polish zloty	Pound sterling	Romanian leu	Swedish krona	Swiss franc	US Dollar
	1	2	3	4	5	6	7	8	9	10	11	12
2015	6.973	7.614	27.279	7.459	309.996	134.314	4.184	0.726	4.4454	9.353	1.068	1.110
2016	7.352	7.533	27.034	7.445	311.438	120.197	4.363	0.819	4.4904	9.469	1.090	1.107
2017	7.629	7.464	26.326	7.439	309.193	126.711	4.257	0.877	4.5688	9.635	1.112	1.130
2017 Q2	7.560	7.430	26.535	7.438	309.764	122.584	4.215	0.861	4.5532	9.692	1.084	1.102
Q3	7.834	7.426	26.085	7.438	306.418	130.349	4.258	0.898	4.5822	9.557	1.131	1.175
Q4	7.789	7.533	25.650	7.443	311.597	132.897	4.232	0.887	4.6189	9.793	1.162	1.177
2018 Q1	7.815	7.438	25.402	7.447	311.027	133.166	4.179	0.883	4.6553	9.971	1.165	1.229
2017 Dec.	7.807	7.539	25.645	7.443	313.163	133.638	4.203	0.883	4.6348	9.937	1.169	1.184
2018 Jan.	7.840	7.436	25.452	7.445	309.269	135.255	4.163	0.883	4.6491	9.820	1.172	1.220
Feb.	7.807	7.440	25.320	7.446	311.735	133.293	4.165	0.884	4.6559	9.938	1.154	1.235
Mar.	7.798	7.438	25.429	7.449	312.194	130.858	4.209	0.883	4.6613	10.161	1.168	1.234
Apr.	7.735	7.421	25.365	7.448	311.721	132.158	4.194	0.872	4.6578	10.372	1.189	1.228
May	7.529	7.391	25.640	7.448	316.930	129.572	4.285	0.877	4.6404	10.342	1.178	1.181
Percentage change versus previous month												
2018 May	-2.7	-0.4	1.1	0.0	1.7	-2.0	2.2	0.6	-0.4	-0.3	-0.9	-3.8
Percentage change versus previous year												
2018 May	-1.1	-0.5	-3.5	0.1	2.3	4.4	2.0	2.5	1.9	6.5	8.0	6.8

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)												
2017 Q1	25,245.3	25,690.0	-444.7	11,172.4	9,021.1	8,225.5	10,715.6	-60.7	5,181.5	5,953.3	726.6	14,231.8
Q2	24,718.0	25,150.8	-432.8	10,918.3	8,790.0	8,148.6	10,598.6	-46.0	5,014.4	5,762.3	682.7	13,852.5
Q3	24,554.9	24,904.9	-350.0	10,603.8	8,508.0	8,314.0	10,609.1	-57.2	5,019.4	5,787.9	674.8	13,740.7
Q4	24,648.1	24,798.0	-149.8	10,561.0	8,510.7	8,499.4	10,594.2	-51.2	4,969.3	5,693.0	669.7	13,514.5
Outstanding amounts as a percentage of GDP												
2017 Q4	220.6	222.0	-1.3	94.5	76.2	76.1	94.8	-0.5	44.5	51.0	6.0	121.0
Transactions												
2017 Q2	214.7	137.8	76.9	32.4	15.5	172.0	150.5	-0.5	12.3	-28.2	-1.4	-
Q3	69.9	-56.9	126.9	-153.1	-146.3	188.2	53.8	-10.3	44.6	35.6	0.5	-
Q4	147.0	-32.0	179.0	74.4	23.6	102.3	27.0	6.0	-37.5	-82.6	1.9	-
2018 Q1	389.8	270.5	119.3	91.2	-1.0	147.5	113.2	-3.1	142.6	158.3	11.6	-
2017 Oct.	230.0	182.2	47.8	74.5	42.3	30.5	-23.3	0.3	127.4	163.1	-2.7	-
Nov.	87.4	45.0	42.4	12.7	7.6	62.1	53.6	2.6	3.9	-16.2	6.2	-
Dec.	-170.3	-259.1	88.8	-12.8	-26.4	9.7	-3.3	3.1	-168.7	-229.5	-1.6	-
2018 Jan.	310.3	295.5	14.8	35.7	11.0	87.9	66.5	0.6	183.8	218.0	2.3	-
Feb.	92.2	73.9	18.4	25.0	20.6	29.6	-16.3	0.8	37.0	69.5	-0.1	-
Mar.	-12.7	-98.8	86.1	30.5	-32.6	30.0	63.0	-4.5	-78.2	-129.2	9.5	-
12-month cumulated transactions												
2018 Mar.	821.5	319.5	502.0	44.9	-108.2	610.0	344.6	-8.0	162.0	83.1	12.6	-
12-month cumulated transactions as a percentage of GDP												
2018 Mar.	7.3	2.8	4.5	0.4	-1.0	5.4	3.1	-0.1	1.4	0.7	0.1	-

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)											
2015	10,519.9	10,014.4	5,735.4	2,171.8	2,077.6	1,016.3	637.9	417.9	29.5	505.5	4,868.4	4,362.9
2016	10,789.4	10,286.2	5,870.3	2,222.4	2,189.1	1,051.7	674.4	457.5	4.4	503.2	4,958.0	4,454.8
2017	11,171.9	10,639.7	6,054.9	2,275.5	2,290.5	1,116.2	711.1	457.7	18.8	532.2	5,312.5	4,780.3
2017 Q2	2,782.5	2,657.3	1,510.1	566.9	573.7	278.1	176.0	118.2	6.6	125.2	1,315.0	1,189.8
Q3	2,811.2	2,672.3	1,518.1	571.2	574.3	280.7	179.6	112.6	8.7	138.9	1,331.8	1,192.9
Q4	2,836.0	2,689.7	1,528.5	575.3	584.4	285.6	184.0	113.3	1.6	146.3	1,368.4	1,222.1
2018 Q1	2,854.9	2,715.0	1,542.8	577.1	590.9	291.3	183.8	114.4	4.1	139.9	1,367.5	1,227.6
	as a percentage of GDP											
2017	100.0	95.2	54.2	20.4	20.5	10.0	6.4	4.1	0.2	4.8	-	-
	Chain-linked volumes (prices for the previous year)											
	quarter-on-quarter percentage changes											
2017 Q2	0.7	0.9	0.5	0.5	2.0	1.1	2.0	4.1	-	-	1.1	1.6
Q3	0.7	0.2	0.4	0.5	-0.3	0.3	1.9	-5.0	-	-	1.5	0.5
Q4	0.7	0.3	0.2	0.3	1.3	1.0	2.4	0.4	-	-	2.2	1.5
2018 Q1	0.4	0.6	0.5	0.0	0.5	1.1	-0.5	0.7	-	-	-0.4	-0.1
	annual percentage changes											
2015	2.1	2.0	1.8	1.3	3.3	0.5	5.4	7.3	-	-	6.4	6.7
2016	1.8	2.3	2.0	1.8	4.6	2.5	5.6	8.4	-	-	3.3	4.6
2017	2.4	1.9	1.6	1.2	3.2	3.7	5.0	-0.7	-	-	5.3	4.3
2017 Q2	2.5	2.3	1.9	1.1	3.7	4.4	4.3	1.1	-	-	4.7	4.5
Q3	2.8	2.0	1.8	1.4	2.7	4.0	6.0	-4.7	-	-	5.9	4.4
Q4	2.8	1.6	1.4	1.3	3.2	4.2	7.4	-5.0	-	-	6.6	4.3
2018 Q1	2.5	2.0	1.5	1.2	3.6	3.6	6.1	-0.1	-	-	4.5	3.5
	contributions to quarter-on-quarter percentage changes in GDP; percentage points											
2017 Q2	0.7	0.9	0.3	0.1	0.4	0.1	0.1	0.2	0.1	-0.1	-	-
Q3	0.7	0.2	0.2	0.1	-0.1	0.0	0.1	-0.2	0.0	0.5	-	-
Q4	0.7	0.3	0.1	0.1	0.3	0.1	0.2	0.0	-0.1	0.4	-	-
2018 Q1	0.4	0.5	0.3	0.0	0.1	0.1	0.0	0.0	0.2	-0.1	-	-
	contributions to annual percentage changes in GDP; percentage points											
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	-0.2	-0.4	-	-
2017	2.4	1.8	0.9	0.2	0.6	0.4	0.3	0.0	0.1	0.6	-	-
2017 Q2	2.5	2.2	1.0	0.2	0.8	0.4	0.3	0.0	0.2	0.3	-	-
Q3	2.8	1.9	1.0	0.3	0.6	0.4	0.4	-0.2	0.1	0.9	-	-
Q4	2.8	1.6	0.8	0.3	0.7	0.4	0.5	-0.2	-0.1	1.3	-	-
2018 Q1	2.5	1.9	0.8	0.3	0.7	0.4	0.4	0.0	0.1	0.6	-	-

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)											
2015	9,447.6	154.6	1,903.1	468.9	1,786.4	432.9	463.6	1,070.6	1,029.9	1,808.4	329.3	1,072.2
2016	9,679.3	151.3	1,939.9	487.8	1,830.6	450.8	452.3	1,096.9	1,076.6	1,855.4	337.7	1,110.1
2017	10,016.3	163.9	2,000.7	513.7	1,912.2	467.4	445.8	1,130.2	1,131.8	1,904.3	346.3	1,155.5
2017 Q2	2,494.7	40.8	497.7	127.9	477.3	116.6	111.2	281.4	281.1	474.5	86.2	287.8
Q3	2,521.0	41.0	504.6	129.7	481.1	117.6	111.9	284.1	285.4	478.4	87.2	290.2
Q4	2,542.7	41.6	511.4	131.8	484.9	118.5	111.4	285.5	288.7	481.5	87.6	293.3
2018 Q1	2,558.2	41.6	512.2	134.2	488.3	119.3	111.9	287.8	291.5	483.5	88.1	296.7
	as a percentage of value added											
2017	100.0	1.6	20.0	5.1	19.1	4.7	4.5	11.3	11.3	19.0	3.5	-
	Chain-linked volumes (prices for the previous year)											
	quarter-on-quarter percentage changes											
2017 Q2	0.7	0.1	1.1	1.1	0.9	0.8	0.2	0.2	1.0	0.5	0.4	0.8
Q3	0.8	0.0	1.5	0.5	0.5	1.4	-0.1	0.5	0.8	0.5	0.8	0.2
Q4	0.7	0.2	1.6	1.1	0.7	0.7	0.1	0.2	0.8	0.2	0.1	0.5
2018 Q1	0.4	1.5	-0.3	0.7	0.8	0.8	-0.2	0.4	0.7	0.2	0.2	0.6
	annual percentage changes											
2015	1.9	3.0	3.8	0.7	2.0	3.5	-0.4	0.6	3.0	0.9	0.6	3.4
2016	1.7	-1.8	1.9	1.3	1.9	3.2	0.6	0.8	3.1	1.4	1.5	2.8
2017	2.4	0.8	3.0	3.0	3.3	4.7	-1.2	1.3	4.0	1.3	1.2	2.4
2017 Q2	2.5	0.4	3.1	3.3	3.6	5.2	-1.4	1.2	3.6	1.3	1.1	2.9
Q3	2.8	0.8	4.0	3.4	3.7	4.7	-1.2	1.6	4.4	1.5	1.6	2.5
Q4	2.9	1.8	4.6	4.2	3.4	4.3	-0.3	1.5	4.3	1.3	1.4	1.9
2018 Q1	2.6	1.8	3.9	3.5	2.9	3.8	0.0	1.4	3.4	1.4	1.4	2.2
	contributions to quarter-on-quarter percentage changes in value added; percentage points											
2017 Q2	0.7	0.0	0.2	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.0	-
Q3	0.8	0.0	0.3	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	-
Q4	0.7	0.0	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	-
2018 Q1	0.4	0.0	-0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	-
	contributions to annual percentage changes in value added; percentage points											
2015	1.9	0.1	0.7	0.0	0.4	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	0.1	-
2017	2.3	0.0	0.6	0.2	0.6	0.2	-0.1	0.2	0.4	0.3	0.0	-
2017 Q2	2.5	0.0	0.6	0.2	0.7	0.2	-0.1	0.1	0.4	0.3	0.0	-
Q3	2.8	0.0	0.8	0.2	0.7	0.2	-0.1	0.2	0.5	0.3	0.1	-
Q4	2.9	0.0	0.9	0.2	0.6	0.2	0.0	0.2	0.5	0.3	0.0	-
2018 Q1	2.6	0.0	0.8	0.2	0.5	0.2	0.0	0.2	0.4	0.3	0.0	-

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													
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	7.0
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
2017	100.0	85.7	14.3	3.2	14.7	5.9	24.9	2.8	2.5	1.0	13.7	24.2	7.0
annual percentage changes													
2015	1.0	1.2	-0.3	-1.1	0.1	0.1	1.3	1.6	-0.4	0.9	2.7	1.1	0.6
2016	1.4	1.6	-0.2	-0.2	0.6	-0.3	1.7	2.7	0.0	2.1	2.9	1.4	0.8
2017	1.6	2.0	-0.4	-0.1	1.2	1.6	1.7	3.2	-1.0	1.8	3.3	1.3	1.3
2017 Q2	1.6	2.0	-0.6	0.4	1.1	1.1	1.8	3.4	-0.9	1.8	3.2	1.2	1.5
Q3	1.7	2.1	-0.5	-0.8	1.4	1.8	1.8	3.0	-1.0	1.6	3.3	1.2	2.2
Q4	1.6	1.9	-0.5	-0.8	1.4	2.3	1.4	3.1	-1.4	1.9	3.3	1.2	0.9
2018 Q1	1.4	1.8	-0.9	-0.9	1.5	1.9	1.4	2.5	-0.8	2.2	3.1	1.1	0.4
Hours worked													
as a percentage of total hours worked													
2015	100.0	80.3	19.7	4.4	15.4	6.7	25.7	2.9	2.7	1.0	13.0	21.9	6.2
2016	100.0	80.5	19.5	4.3	15.3	6.7	25.8	2.9	2.7	1.0	13.2	21.9	6.2
2017	100.0	80.9	19.1	4.2	15.3	6.7	25.8	3.0	2.6	1.0	13.4	21.8	6.2
annual percentage changes													
2015	1.1	1.4	-0.1	-0.4	0.5	0.5	1.0	2.6	-0.3	1.2	2.7	1.1	1.0
2016	1.4	1.7	0.0	-0.3	0.7	0.1	1.7	2.4	0.7	2.4	3.1	1.3	1.0
2017	1.3	1.8	-0.7	-1.1	1.1	1.5	1.4	3.0	-1.3	1.9	3.1	1.0	0.8
2017 Q2	1.4	1.9	-0.5	-1.1	1.2	1.2	1.7	3.5	-1.5	1.7	3.0	1.0	0.7
Q3	1.7	2.2	-0.4	-1.1	1.7	1.9	1.9	3.0	-0.9	1.5	3.4	1.1	1.7
Q4	1.7	2.2	-0.6	-0.8	2.0	3.2	1.4	3.0	-1.6	3.0	3.4	1.2	0.4
2018 Q1	1.3	1.8	-1.1	-1.4	1.5	2.0	1.2	2.1	-1.0	2.9	2.8	1.1	0.0
Hours worked per person employed													
annual percentage changes													
2015	0.1	0.1	0.3	0.7	0.4	0.4	-0.3	0.9	0.0	0.4	0.1	0.0	0.5
2016	0.0	0.1	0.3	0.0	0.1	0.3	0.0	-0.3	0.7	0.3	0.2	-0.1	0.2
2017	-0.3	-0.1	-0.3	-1.0	-0.1	-0.1	-0.3	-0.2	-0.4	0.1	-0.2	-0.2	-0.6
2017 Q2	-0.2	-0.1	0.1	-1.5	0.1	0.1	-0.1	0.1	-0.5	-0.1	-0.2	-0.2	-0.8
Q3	0.0	0.1	0.1	-0.3	0.3	0.1	0.1	0.0	0.1	-0.1	0.1	-0.1	-0.5
Q4	0.1	0.3	-0.1	0.0	0.6	0.9	0.0	-0.1	-0.2	1.1	0.1	0.0	-0.6
2018 Q1	-0.2	0.0	-0.3	-0.5	0.1	0.1	-0.2	-0.5	-0.1	0.7	-0.3	-0.1	-0.4

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			81.7		18.3		52.2		47.8			
2015	160.717	4.6	17.465	10.9	5.6	14.301	9.8	3.164	22.3	9.260	10.7	8.205	11.1		1.5
2016	162.012	4.3	16.253	10.0	5.0	13.289	9.0	2.965	20.9	8.483	9.7	7.770	10.4		1.7
2017	162.635	4.1	14.760	9.1	4.4	12.093	8.1	2.668	18.8	7.634	8.7	7.126	9.5		1.9
2017 Q2	162.351	4.2	14.851	9.1	4.5	12.132	8.2	2.720	19.2	7.684	8.8	7.168	9.5		1.9
Q3	163.317	4.0	14.606	9.0	4.2	11.967	8.0	2.639	18.5	7.579	8.6	7.028	9.3		1.9
Q4	163.107	3.9	14.226	8.7	4.2	11.669	7.8	2.557	17.9	7.332	8.4	6.894	9.1		2.0
2018 Q1	.	.	14.028	8.6	.	11.536	7.8	2.492	17.5	7.219	8.2	6.809	9.0		2.1
2017 Nov.	-	-	14.213	8.7	-	11.665	7.8	2.548	17.9	7.318	8.4	6.895	9.1		-
Dec.	-	-	14.129	8.7	-	11.601	7.8	2.528	17.8	7.282	8.3	6.846	9.1		-
2018 Jan.	-	-	14.138	8.7	-	11.622	7.8	2.516	17.6	7.275	8.3	6.863	9.1		-
Feb.	-	-	14.010	8.6	-	11.504	7.7	2.506	17.6	7.230	8.2	6.779	9.0		-
Mar.	-	-	13.936	8.6	-	11.483	7.7	2.453	17.3	7.151	8.2	6.785	9.0		-
Apr.	-	-	13.880	8.5	-	11.446	7.7	2.433	17.2	7.113	8.1	6.767	9.0		-

Sources: Eurostat and ECB calculations.

1) Not seasonally adjusted.

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

3.5 Short-term business statistics

	Industrial production						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 2015	100.0	88.7	32.1	34.5	21.8	11.6	100.0	100.0	100.0	40.4	52.5	7.1	100.0
annual percentage changes													
2015	2.6	2.9	1.4	7.0	2.2	0.7	-0.6	3.4	2.9	1.6	4.0	2.7	8.8
2016	1.6	1.7	1.8	1.9	1.7	0.5	3.0	0.5	1.6	1.0	2.1	1.4	7.2
2017	3.0	3.2	3.7	3.9	1.5	1.4	2.9	7.9	2.3	1.4	3.3	0.9	5.6
2017 Q2	2.5	2.6	3.3	2.2	2.0	2.3	3.9	7.4	2.6	2.3	3.2	1.4	6.0
Q3	4.1	4.4	4.7	6.0	1.7	1.5	2.7	8.8	2.6	1.3	4.2	0.4	5.5
Q4	4.1	4.7	5.4	6.0	2.2	-0.5	2.7	9.5	2.0	0.8	3.1	0.0	6.3
2018 Q1	3.1	3.5	3.1	4.4	2.4	0.6	2.5	6.4	1.5	1.4	1.9	0.0	5.3
2017 Nov.	4.8	5.5	4.9	9.1	0.5	-0.6	2.8	10.4	3.7	1.7	5.7	0.4	8.6
Dec.	5.1	5.6	6.2	7.7	2.1	1.2	2.0	9.0	2.2	1.3	3.0	-0.1	4.4
2018 Jan.	3.6	6.0	5.1	8.6	3.2	-9.7	6.9	9.1	1.4	0.0	3.0	-1.3	6.4
Feb.	2.6	2.3	2.7	2.0	1.9	4.9	0.2	5.7	1.8	1.9	1.9	0.7	4.8
Mar.	3.2	2.4	1.7	3.0	2.0	8.7	0.8	4.6	1.5	2.3	0.8	0.5	4.8
Apr.	1.7	2.0	0.8	4.3	0.7	-0.7	.	.	1.7	0.4	3.2	-0.7	2.7
month-on-month percentage changes (s.a.)													
2017 Nov.	1.5	1.4	0.7	2.7	0.5	2.5	0.3	1.8	2.1	1.2	3.1	0.4	4.5
Dec.	-0.2	-0.4	1.0	-1.7	0.1	0.6	1.0	1.6	-1.0	-0.2	-1.8	-0.5	0.4
2018 Jan.	-0.6	0.3	-1.1	0.6	0.5	-6.2	-0.7	-2.1	-0.4	-0.7	0.0	-0.1	0.1
Feb.	-0.8	-1.9	-0.8	-3.4	-1.2	6.9	-0.7	-0.4	0.3	1.1	-0.3	1.0	-0.6
Mar.	0.6	0.5	-0.1	-0.4	1.5	1.0	-0.3	-0.9	0.4	0.6	-0.2	-0.4	-0.1
Apr.	-0.9	-0.3	-0.8	1.9	-1.6	-5.0	.	.	0.1	-0.7	1.7	-0.8	-2.0

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
1999-14	99.8	-5.8	80.7	-12.7	-14.5	-9.5	6.9	-	51.1	52.4	52.9	52.7
2015	103.8	-2.8	81.3	-6.2	-22.4	1.0	8.7	88.5	52.2	53.4	54.0	53.8
2016	104.2	-2.6	81.8	-7.7	-16.4	0.3	10.6	89.0	52.5	53.6	53.1	53.3
2017	110.8	5.0	83.3	-2.5	-4.0	2.1	14.1	89.9	57.4	58.5	55.6	56.4
2017 Q2	109.5	3.8	83.0	-2.8	-4.8	1.8	13.0	89.9	57.0	58.3	56.0	56.6
Q3	111.8	6.1	83.7	-1.5	-2.2	1.9	14.5	90.1	57.4	58.0	55.3	56.0
Q4	114.3	8.9	84.2	-0.2	1.7	3.9	16.1	90.1	59.7	60.7	56.0	57.2
2018 Q1	114.0	8.5	84.4	0.5	4.7	2.8	16.3	90.3	58.2	58.9	56.4	57.0
2017 Dec.	115.2	9.5	-	0.5	3.2	4.8	16.9	-	60.6	62.2	56.6	58.1
2018 Jan.	114.9	9.7	84.5	1.4	4.7	4.1	15.9	90.4	59.6	61.1	58.0	58.8
Feb.	114.3	8.8	-	0.1	4.2	3.5	16.9	-	58.6	59.6	56.2	57.1
Mar.	112.8	7.0	-	0.1	5.2	0.8	16.0	-	56.6	55.9	54.9	55.2
Apr.	112.7	7.3	84.3	0.3	4.6	-0.7	14.7	90.2	56.2	56.2	54.7	55.1
May	112.5	6.8	-	0.2	7.0	0.7	14.3	-	55.5	54.8	53.8	54.1

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

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

	Households							Non-financial corporations					
	Saving ratio (gross) [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	94.3	1.0	1.9	1.3	2.3	0.9	32.4	4.9	132.1	2.9	7.2	1.6
2015	12.4	93.7	1.5	2.0	1.4	3.4	2.5	33.2	6.3	134.4	4.4	4.8	2.3
2016	12.2	93.3	1.9	2.0	5.5	4.5	4.5	33.0	7.7	134.5	4.0	6.1	2.1
2017 Q1	12.1	93.0	1.5	1.9	9.7	4.8	4.6	33.0	7.1	134.6	4.6	10.1	2.6
Q2	12.0	93.2	1.2	2.0	5.3	5.0	4.7	32.9	6.4	133.3	4.2	10.2	2.5
Q3	12.0	93.1	1.5	2.1	6.7	5.1	5.2	33.2	6.5	132.0	4.3	4.1	2.6
Q4	12.0	93.6	1.3	2.1	7.3	5.2	6.0	33.5	6.9	131.7	3.7	3.4	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
2017 Q2	965.1	887.4	77.6	560.9	477.7	209.3	190.3	168.5	150.2	26.4	69.3	7.2	18.2
Q3	988.8	873.1	115.7	575.5	482.8	214.5	186.3	171.8	138.5	26.9	65.4	7.1	8.4
Q4	996.7	890.8	105.9	590.5	496.3	217.2	188.5	161.1	143.4	27.9	62.5	12.0	9.6
2018 Q1	984.9	876.5	108.5	584.4	496.1	217.3	189.8	156.1	134.4	27.2	56.1	8.8	7.6
2017 Oct.	327.3	292.2	35.1	192.3	163.0	72.0	62.4	54.2	46.0	8.8	20.8	2.9	2.2
Nov.	331.8	295.2	36.5	197.0	165.7	71.8	63.2	53.8	45.5	9.1	20.9	2.8	2.3
Dec.	337.7	303.4	34.3	201.2	167.6	73.3	62.9	53.1	52.0	10.0	20.9	6.3	5.0
2018 Jan.	330.8	291.1	39.7	196.9	167.6	71.9	63.0	53.0	42.2	8.9	18.3	2.9	1.8
Feb.	324.6	287.9	36.8	192.8	164.1	71.8	62.6	51.7	44.9	8.3	16.4	2.2	1.6
Mar.	329.5	297.5	32.0	194.7	164.4	73.6	64.2	51.3	47.4	9.9	21.4	3.7	4.2
12-month cumulated transactions													
2018 Mar.	3,935.5	3,527.8	407.7	2,311.2	1,953.0	858.3	754.8	657.5	566.5	108.5	253.4	35.1	43.8
12-month cumulated transactions as a percentage of GDP													
2018 Mar.	34.9	31.3	3.6	20.5	17.3	7.6	6.7	5.8	5.0	1.0	2.2	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	Consumption goods	Manufacturing		Intermediate goods	Capital goods	Consumption goods	Manufacturing	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)													
2017 Q2	5.4	10.2	545.6	257.2	112.7	162.8	456.5	489.0	276.1	81.2	124.0	355.5	52.3
Q3	6.0	7.9	547.2	257.0	114.6	164.2	459.8	486.1	273.1	80.9	123.0	355.0	48.4
Q4	6.1	7.6	562.0	267.8	115.8	167.1	471.6	500.3	285.0	81.2	125.0	359.6	58.9
2018 Q1	2.5	1.4	562.5	.	.	.	470.9	500.3	.	.	.	353.1	.
2017 Oct.	9.0	10.8	181.1	86.7	36.5	54.1	151.9	163.5	92.6	27.2	41.3	119.2	17.7
Nov.	8.6	9.3	188.9	90.2	38.8	56.0	158.0	168.2	95.2	27.4	42.3	120.2	19.7
Dec.	0.9	2.6	192.0	91.0	40.5	57.0	161.7	168.6	97.2	26.5	41.3	120.3	21.5
2018 Jan.	9.0	5.9	190.2	92.4	38.0	56.7	158.8	170.2	98.2	27.6	41.5	120.2	23.1
Feb.	2.8	1.1	185.4	90.0	37.3	54.7	155.5	164.4	95.4	25.8	40.1	116.5	21.5
Mar.	-2.9	-2.5	186.9	.	.	.	156.6	165.7	.	.	.	116.4	.
Volume indices (2000 = 100; annual percentage changes for columns 1 and 2)													
2017 Q2	1.5	2.5	122.4	121.0	121.7	125.4	122.1	112.9	112.9	113.3	114.3	116.5	104.7
Q3	3.8	3.4	123.8	121.9	124.8	128.1	124.0	114.3	114.1	115.3	114.0	117.8	100.3
Q4	4.5	3.9	126.4	125.6	125.5	130.4	126.9	114.6	114.7	113.1	115.2	118.2	106.5
2018 Q1	.	.	.	.	.	.	.	.	.	.	.	.	.
2017 Sep.	3.1	1.3	125.8	124.1	128.8	128.3	126.2	113.8	113.4	115.8	114.2	117.4	98.2
Oct.	7.0	7.7	122.8	122.7	120.4	126.3	123.0	114.8	114.8	117.0	115.2	119.2	102.6
Nov.	6.8	4.2	127.6	126.6	126.1	132.1	127.6	115.3	114.4	115.3	116.6	118.3	105.2
Dec.	-0.2	-0.3	128.9	127.5	130.1	132.7	130.0	113.7	114.9	107.1	113.9	117.0	111.7
2018 Jan.	8.5	5.0	127.5	128.3	122.7	132.8	127.7	114.1	114.8	112.7	114.1	116.9	114.2
Feb.	3.4	1.9	125.1	126.0	121.8	128.5	125.8	112.5	113.4	109.1	112.4	115.4	110.8

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 2018	100.0	100.0	70.7	55.6	44.4	100.0	12.1	7.5	26.3	9.7	44.4	86.6	13.4
2015	100.0	0.0	0.8	-0.8	1.2	-	-	-	-	-	-	-0.1	1.0
2016	100.2	0.2	0.9	-0.4	1.1	-	-	-	-	-	-	0.2	0.3
2017	101.8	1.5	1.0	1.7	1.4	-	-	-	-	-	-	1.6	1.0
2017 Q2	102.0	1.5	1.1	1.5	1.6	0.1	0.6	-1.2	0.1	-1.4	0.5	1.6	1.3
Q3	101.8	1.4	1.2	1.4	1.5	0.2	0.7	0.4	0.1	-0.9	0.3	1.5	1.1
Q4	102.4	1.4	0.9	1.6	1.2	0.4	0.5	1.1	0.1	2.6	0.1	1.5	1.2
2018 Q1	102.3	1.3	1.0	1.2	1.3	0.5	0.7	0.1	0.1	1.9	0.5	1.2	1.9
2017 Dec.	102.7	1.4	0.9	1.5	1.2	0.1	0.2	0.2	0.1	0.1	0.1	1.4	1.2
2018 Jan.	101.8	1.3	1.0	1.4	1.2	0.3	0.3	0.0	0.1	1.8	0.1	1.2	1.9
Feb.	102.0	1.1	1.0	1.0	1.3	0.0	-0.1	-0.2	0.0	-0.3	0.1	1.0	1.8
Mar.	103.0	1.3	1.0	1.2	1.5	0.1	0.7	0.1	-0.1	-0.8	0.3	1.2	2.0
Apr.	103.3	1.2	0.7	1.4	1.0	0.1	0.3	0.1	0.0	0.8	0.0	1.2	1.6
May [3)]	103.8	1.9	1.1	.	1.6	0.5	0.0	0.9	0.0	2.2	0.4	.	.

	Goods						Services					
	Food (including alcoholic beverages and tobacco)			Industrial goods			Housing		Transport	Communication	Recreation and personal care	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 2018	19.6	12.1	7.5	36.0	26.3	9.7	10.6	6.4	7.3	3.2	15.3	8.1
2015	1.0	0.6	1.6	-1.8	0.3	-6.8	1.2	1.1	1.3	-0.8	1.5	1.2
2016	0.9	0.6	1.4	-1.1	0.4	-5.1	1.1	1.1	0.8	0.0	1.4	1.2
2017	1.8	1.6	2.2	1.6	0.4	4.9	1.3	1.2	2.1	-1.5	2.1	0.7
2017 Q2	1.5	1.4	1.6	1.5	0.3	4.6	1.3	1.3	2.6	-1.4	2.3	0.8
Q3	1.6	2.0	0.9	1.3	0.5	3.4	1.3	1.2	2.3	-1.8	2.4	0.8
Q4	2.2	2.1	2.3	1.3	0.4	3.5	1.2	1.2	1.7	-1.7	2.0	0.4
2018 Q1	1.7	2.6	0.3	0.9	0.5	2.1	1.3	1.3	1.7	-1.0	1.8	1.2
2017 Dec.	2.1	2.2	1.9	1.2	0.5	2.9	1.2	1.2	1.9	-1.7	1.9	0.4
2018 Jan.	1.9	2.5	1.1	1.0	0.6	2.2	1.3	1.2	1.5	-1.0	1.6	1.2
Feb.	1.0	2.3	-0.9	1.0	0.6	2.1	1.3	1.3	1.7	-1.2	1.7	1.1
Mar.	2.1	2.9	0.8	0.7	0.2	2.0	1.3	1.3	1.9	-0.9	2.1	1.2
Apr.	2.4	3.0	1.5	0.9	0.3	2.6	1.3	1.3	0.8	-0.7	1.2	1.2
May [3)]	2.6	2.6	2.5	.	0.2	6.1	.	.	.	.	.	.

Sources: Eurostat and ECB calculations.

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

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

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

4 Prices and costs

4.2 Industry, construction and property prices

(annual percentage changes, unless otherwise indicated)

	Industrial producer prices excluding construction [1]										Con-struction	Residential property prices [2]	Experimental indicator of commercial property prices [2]
	Total (index: 2015 = 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 2015	100.0	100.0	77.3	72.1	28.9	20.7	22.5	16.5	5.9	27.9			
2015	100.0	-2.6	-2.3	-0.5	-1.2	0.7	-0.6	-0.9	0.2	-8.7	0.4	1.6	2.3
2016	97.8	-2.2	-1.4	-0.5	-1.6	0.4	0.0	0.0	0.0	-6.9	0.6	3.2	5.0
2017	100.8	3.1	3.0	2.1	3.2	0.9	1.9	2.7	0.2	5.9	2.1	4.1	5.1
2017 Q2	100.3	3.3	3.0	2.4	3.5	0.8	2.3	3.4	0.2	6.1	2.0	3.9	4.2
Q3	100.5	2.4	2.6	2.1	3.0	1.0	2.2	3.1	0.2	3.3	2.0	4.2	5.7
Q4	101.7	2.5	2.5	2.0	3.2	0.9	1.5	2.0	0.3	3.8	2.4	4.6	6.6
2018 Q1	102.5	1.8	1.6	1.6	2.4	1.0	0.9	1.1	0.5	2.3	.	.	.
2017 Nov.	101.9	2.8	2.8	2.0	3.1	1.0	1.5	2.1	0.3	5.2	-	-	-
Dec.	102.0	2.2	2.1	1.9	2.9	0.9	1.3	1.7	0.4	3.0	-	-	-
2018 Jan.	102.4	1.6	2.0	1.8	2.8	0.9	1.0	1.3	0.4	1.1	-	-	-
Feb.	102.5	1.7	1.4	1.6	2.4	1.0	0.8	1.0	0.5	2.0	-	-	-
Mar.	102.6	2.1	1.6	1.4	2.2	1.0	0.9	1.2	0.5	3.8	-	-	-
Apr.	102.6	2.0	1.9	1.3	2.1	1.0	0.5	0.4	0.5	3.8	-	-	-

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
2015	106.0	1.4	0.4	0.3	0.6	0.7	0.4	-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	0.7	-1.5	-2.4	39.9	-3.7	-4.0	-3.3	-7.4	-10.4	-3.0
2017	108.0	1.1	1.5	1.5	1.2	1.4	1.8	2.9	48.1	5.9	-3.5	16.4	5.5	-3.3	17.5
2017 Q2	107.9	1.1	1.5	1.5	1.2	1.4	2.2	3.2	45.6	7.0	-2.7	18.4	6.8	-2.4	20.1
Q3	108.2	1.3	1.6	1.5	1.2	1.5	1.4	2.1	44.0	1.9	-7.5	12.3	2.6	-5.8	13.5
Q4	108.4	1.2	1.5	1.4	1.3	1.5	1.2	1.8	52.2	-2.6	-9.6	4.6	-0.1	-5.4	6.3
2018 Q1	108.7	1.3	1.4	1.3	1.3	1.7	0.3	0.4	54.6	-9.0	-14.6	-3.6	-7.7	-12.8	-1.9
2017 Dec.	-	-	-	-	-	-	-	-	54.2	-7.0	-13.3	-1.0	-5.1	-10.4	1.0
2018 Jan.	-	-	-	-	-	-	-	-	56.6	-8.1	-16.2	-0.2	-6.4	-13.5	2.0
Feb.	-	-	-	-	-	-	-	-	53.0	-9.5	-14.7	-4.6	-7.8	-12.4	-2.6
Mar.	-	-	-	-	-	-	-	-	53.9	-9.3	-12.9	-6.0	-8.8	-12.4	-4.8
Apr.	-	-	-	-	-	-	-	-	58.4	-5.0	-10.4	0.1	-5.3	-11.3	1.5
May	-	-	-	-	-	-	-	-	64.9	3.8	-5.0	12.6	2.9	-6.3	13.9

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
1999-14	4.4	-	-	-3.1	33.5	57.2	56.5	-	49.8
2015	-3.1	3.1	2.3	-13.2	-0.2	48.9	53.5	49.6	49.0
2016	-1.0	2.2	4.1	-7.2	0.2	49.8	53.9	49.3	49.6
2017	8.7	5.0	6.7	2.6	12.3	64.6	56.3	55.1	51.6
2017 Q2	7.5	4.1	5.7	2.0	12.3	62.5	55.9	54.6	51.5
Q3	8.1	4.3	6.6	3.4	10.4	60.4	55.7	54.4	51.4
Q4	10.9	7.1	8.2	8.2	13.8	67.9	56.9	56.3	52.1
2018 Q1	12.5	6.7	8.9	10.9	17.4	68.4	57.2	57.9	52.9
2017 Dec.	13.4	7.3	7.9	8.8	13.6	67.9	57.1	56.3	52.0
2018 Jan.	13.0	7.1	9.0	10.6	17.3	70.7	58.4	58.1	53.6
Feb.	12.6	6.5	9.4	10.2	18.3	68.7	56.9	58.4	52.9
Mar.	11.9	6.4	8.3	11.8	16.5	65.8	56.3	57.3	52.1
Apr.	9.9	6.1	9.0	9.8	16.3	63.9	56.5	57.5	51.8
May	9.3	7.3	9.1	14.3	18.0	65.3	57.6	56.4	52.0

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	
2015	104.3	1.6	1.9	0.7	1.6	1.6	1.5
2016	105.8	1.5	1.4	1.6	1.4	1.6	1.4
2017	107.5	1.6	1.8	1.3	1.7	1.4	1.5
2017 Q2	111.2	1.8	2.2	0.8	1.9	1.7	1.5
Q3	104.2	1.6	1.7	1.5	1.9	1.0	1.5
Q4	114.0	1.5	1.8	1.1	1.8	1.1	1.6
2018 Q1	.	.	.	.	.	.	1.9

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						
2015	104.8	0.4	-3.0	-1.5	0.6	0.7	0.7	0.7	2.6	1.4	1.3	1.7
2016	105.6	0.7	2.1	0.0	0.1	1.2	-0.3	1.7	3.5	0.3	1.3	1.1
2017	106.4	0.8	0.0	-0.3	0.1	0.1	0.2	1.4	4.4	1.6	1.6	1.6
2017 Q2	106.2	0.7	0.8	-0.5	-0.4	-0.4	-0.2	1.8	5.5	2.0	1.6	1.8
Q3	106.3	0.5	-0.4	-1.1	-0.5	0.0	0.8	1.1	3.8	1.5	1.3	1.4
Q4	106.6	0.6	-0.8	-1.3	-0.1	-0.2	0.7	0.0	4.5	1.5	1.7	1.4
2018 Q1	107.0	0.8	-0.3	-0.7	-0.2	0.5	1.1	0.8	4.1	2.2	1.3	1.3
						Compensation per employee						
2015	108.2	1.5	1.1	2.1	1.2	1.5	2.6	0.7	2.3	1.7	1.2	1.8
2016	109.5	1.2	0.5	1.3	1.6	1.4	0.2	2.3	2.1	0.5	1.2	1.8
2017	111.2	1.6	0.9	1.5	1.5	1.6	1.6	1.2	3.9	2.3	1.6	1.5
2017 Q2	111.0	1.5	0.8	1.4	1.9	1.4	1.6	1.3	4.8	2.3	1.7	1.5
Q3	111.4	1.6	1.2	1.5	1.1	1.9	2.4	0.8	3.7	2.6	1.5	0.8
Q4	112.2	1.8	1.8	1.8	1.7	1.8	1.9	1.1	4.0	2.5	1.8	1.9
2018 Q1	112.6	1.9	2.5	1.7	1.4	2.0	2.3	1.7	3.2	2.5	1.6	2.3
						Labour productivity per person employed						
2015	103.2	1.1	4.2	3.6	0.6	0.7	1.9	-0.1	-0.3	0.3	-0.2	0.1
2016	103.7	0.4	-1.6	1.3	1.6	0.2	0.5	0.6	-1.3	0.2	0.0	0.8
2017	104.5	0.8	0.9	1.8	1.4	1.5	1.5	-0.2	-0.5	0.7	0.1	-0.1
2017 Q2	104.5	0.9	0.0	1.9	2.2	1.8	1.8	-0.4	-0.6	0.3	0.1	-0.4
Q3	104.8	1.1	1.6	2.6	1.6	1.9	1.6	-0.3	-0.1	1.1	0.2	-0.5
Q4	105.3	1.3	2.6	3.1	1.9	1.9	1.2	1.1	-0.4	0.9	0.1	0.4
2018 Q1	105.3	1.1	2.8	2.4	1.6	1.4	1.3	0.9	-0.8	0.3	0.3	1.0
						Compensation per hour worked						
2015	110.0	1.4	1.2	1.7	0.7	1.6	1.6	0.7	1.6	1.3	1.3	1.6
2016	111.3	1.1	0.0	1.2	1.6	1.1	0.4	1.7	2.0	0.2	1.4	1.6
2017	113.2	1.7	0.9	1.6	1.4	1.8	1.6	1.5	3.7	2.3	1.9	1.8
2017 Q2	112.7	1.7	1.9	1.3	1.6	1.5	1.4	1.9	5.2	2.2	1.9	2.2
Q3	113.0	1.4	-0.1	1.1	0.6	1.7	2.0	0.8	3.6	2.3	1.7	1.1
Q4	113.8	1.5	1.0	1.1	0.9	1.5	1.7	1.2	2.6	2.2	1.7	2.0
2018 Q1	114.4	1.9	2.3	1.6	0.9	2.1	2.6	1.8	2.4	2.6	1.6	2.3
						Hourly labour productivity						
2015	105.3	1.0	3.5	3.3	0.2	1.0	0.9	-0.1	-0.7	0.2	-0.1	-0.4
2016	105.7	0.4	-1.6	1.2	1.3	0.2	0.8	-0.1	-1.6	0.1	0.1	0.6
2017	106.9	1.1	2.0	1.9	1.5	1.9	1.7	0.1	-0.6	0.9	0.3	0.4
2017 Q2	106.6	1.1	1.5	1.9	2.1	1.9	1.7	0.1	-0.5	0.5	0.3	0.5
Q3	106.8	1.1	1.9	2.2	1.5	1.8	1.6	-0.3	0.0	1.0	0.4	0.0
Q4	107.4	1.1	2.6	2.6	1.0	2.0	1.2	1.3	-1.5	0.8	0.1	1.0
2018 Q1	107.6	1.3	3.3	2.4	1.5	1.7	1.7	1.0	-1.5	0.6	0.4	1.4

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												
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	6,083.9	7,159.0	1,329.6	2,221.2	3,550.8	10,709.8	70.4	523.2	95.7	689.2	11,399.0
2017	1,112.0	6,636.6	7,748.6	1,194.4	2,261.2	3,455.5	11,204.1	75.7	509.4	75.7	660.8	11,864.9
2017 Q2	1,095.5	6,383.9	7,479.3	1,259.8	2,237.4	3,497.2	10,976.6	68.2	513.7	76.8	658.6	11,635.2
Q3	1,104.8	6,531.0	7,635.8	1,224.1	2,251.4	3,475.4	11,111.3	66.6	530.5	77.4	674.6	11,785.8
Q4	1,112.0	6,636.6	7,748.6	1,194.4	2,261.2	3,455.5	11,204.1	75.7	509.4	75.7	660.8	11,864.9
2018 Q1	1,113.4	6,736.7	7,850.1	1,171.3	2,265.9	3,437.2	11,287.3	71.6	505.7	74.6	652.0	11,939.2
2017 Nov.	1,110.2	6,613.1	7,723.3	1,201.8	2,258.9	3,460.7	11,184.0	78.4	518.8	77.5	674.8	11,858.8
Dec.	1,112.0	6,636.6	7,748.6	1,194.4	2,261.2	3,455.5	11,204.1	75.7	509.4	75.7	660.8	11,864.9
2018 Jan.	1,114.5	6,679.0	7,793.4	1,198.0	2,263.9	3,461.9	11,255.3	74.7	514.5	61.6	650.9	11,906.2
Feb.	1,115.6	6,713.2	7,828.7	1,178.5	2,265.4	3,443.9	11,272.6	72.8	502.5	63.0	638.3	11,910.8
Mar.	1,113.4	6,736.7	7,850.1	1,171.3	2,265.9	3,437.2	11,287.3	71.6	505.7	74.6	652.0	11,939.2
Apr. [p]	1,122.2	6,752.3	7,874.4	1,159.4	2,270.0	3,429.5	11,303.9	81.9	511.4	74.8	668.1	11,972.0
Transactions												
2015	66.5	566.9	633.3	-134.5	12.3	-122.2	511.2	-47.4	49.7	-27.2	-25.0	486.1
2016	37.5	541.7	579.2	-105.6	16.0	-89.5	489.7	-4.2	38.0	16.1	49.8	539.5
2017	37.1	588.2	625.3	-111.8	36.3	-75.5	549.8	6.7	-13.7	-19.0	-26.0	523.8
2017 Q2	7.8	155.5	163.3	-36.7	11.3	-25.4	137.9	-5.6	-17.5	-19.3	-42.5	95.5
Q3	9.5	157.0	166.5	-32.6	10.8	-21.8	144.7	-1.1	16.8	3.2	19.0	163.7
Q4	7.2	108.9	116.2	-21.6	9.8	-11.7	104.4	9.4	-21.4	-5.9	-17.9	86.5
2018 Q1	1.4	104.2	105.6	-21.4	6.0	-15.4	90.2	-3.9	-3.6	-0.1	-7.5	82.7
2017 Nov.	0.1	69.3	69.4	-7.9	0.4	-7.5	61.9	9.8	-9.4	5.2	5.6	67.5
Dec.	1.9	26.0	27.8	-6.4	2.3	-4.2	23.6	-2.6	-9.5	-2.0	-14.1	9.5
2018 Jan.	2.4	49.0	51.5	6.3	4.3	10.6	62.0	-0.6	5.1	-13.0	-8.5	53.5
Feb.	1.1	30.0	31.1	-21.1	1.1	-20.0	11.1	-2.1	-12.1	0.6	-13.6	-2.5
Mar.	-2.2	25.2	23.0	-6.6	0.6	-5.9	17.1	-1.2	3.4	12.4	14.6	31.7
Apr. [p]	8.8	12.2	21.0	-12.4	4.1	-8.3	12.7	7.5	5.7	-0.4	12.8	25.5
Growth rates												
2015	6.8	11.3	10.6	-8.5	0.6	-3.3	5.3	-38.9	11.4	-25.4	-3.8	4.7
2016	3.6	9.7	8.8	-7.3	0.7	-2.5	4.8	-5.7	7.8	21.0	7.8	5.0
2017	3.4	9.7	8.8	-8.5	1.6	-2.1	5.1	9.7	-2.6	-20.6	-3.8	4.6
2017 Q2	3.9	10.6	9.6	-9.3	1.0	-3.0	5.2	-18.6	5.0	-16.3	-0.9	4.9
Q3	3.6	11.0	9.9	-10.4	1.4	-3.2	5.5	-13.2	5.6	-11.3	1.2	5.2
Q4	3.4	9.7	8.8	-8.5	1.6	-2.1	5.1	9.7	-2.6	-20.6	-3.8	4.6
2018 Q1	2.4	8.4	7.5	-8.7	1.7	-2.1	4.4	-1.6	-4.8	-23.2	-7.0	3.7
2017 Nov.	3.3	10.2	9.2	-9.3	1.7	-2.5	5.3	10.0	1.4	-19.6	-0.6	4.9
Dec.	3.4	9.7	8.8	-8.5	1.6	-2.1	5.1	9.7	-2.6	-20.6	-3.8	4.6
2018 Jan.	3.1	9.8	8.8	-8.1	1.7	-1.9	5.3	-1.6	-1.0	-31.8	-5.1	4.6
Feb.	2.8	9.4	8.4	-9.3	1.8	-2.3	4.9	7.7	-2.3	-32.3	-5.3	4.3
Mar.	2.4	8.4	7.5	-8.7	1.7	-2.1	4.4	-1.6	-4.8	-23.2	-7.0	3.7
Apr. [p]	2.8	7.8	7.0	-8.3	1.8	-1.9	4.2	11.6	-1.5	-6.0	-0.6	3.9

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													
2015	1,953.2	1,503.9	323.6	117.4	8.3	5,750.7	3,060.7	695.0	1,992.3	2.7	957.9	226.6	365.5
2016	2,082.3	1,617.4	296.2	160.3	8.4	6,052.3	3,400.9	644.8	2,004.7	1.9	989.1	198.2	383.2
2017	2,243.1	1,786.8	287.0	159.8	9.5	6,301.7	3,697.5	561.5	2,042.0	0.6	1,010.8	202.2	409.9
2017 Q2	2,190.1	1,732.1	293.6	158.0	6.4	6,189.3	3,560.7	600.8	2,025.5	2.3	970.3	196.5	403.1
Q3	2,219.9	1,770.4	286.0	158.3	5.3	6,255.9	3,633.7	583.6	2,036.6	2.0	977.1	201.0	419.2
Q4	2,243.1	1,786.8	287.0	159.8	9.5	6,301.7	3,697.5	561.5	2,042.0	0.6	1,010.8	202.2	409.9
2018 Q1	2,256.9	1,818.8	273.4	157.2	7.6	6,375.2	3,781.0	542.7	2,050.0	1.5	990.8	209.5	413.1
2017 Nov.	2,247.7	1,798.0	282.2	159.6	7.9	6,295.1	3,682.1	568.5	2,042.5	2.0	989.3	208.1	412.1
Dec.	2,243.1	1,786.8	287.0	159.8	9.5	6,301.7	3,697.5	561.5	2,042.0	0.6	1,010.8	202.2	409.9
2018 Jan.	2,283.5	1,823.4	291.9	157.7	10.5	6,329.6	3,724.4	556.1	2,047.4	1.7	986.0	203.8	412.7
Feb.	2,266.6	1,812.6	287.0	158.1	8.9	6,359.5	3,760.1	548.7	2,048.9	1.8	982.3	207.9	413.7
Mar.	2,256.9	1,818.8	273.4	157.2	7.6	6,375.2	3,781.0	542.7	2,050.0	1.5	990.8	209.5	413.1
Apr. [p]	2,270.2	1,837.5	269.5	155.6	7.6	6,405.8	3,808.6	539.3	2,056.1	1.8	956.1	211.5	420.0
Transactions													
2015	85.1	124.3	-32.9	4.9	-11.2	194.7	303.8	-109.8	1.2	-0.4	88.3	-0.5	29.6
2016	128.0	151.8	-24.2	0.2	0.2	299.8	333.3	-46.3	13.7	-0.8	30.9	-29.6	18.8
2017	178.9	180.6	-2.8	-0.1	1.1	254.1	303.8	-81.8	33.4	-1.3	53.7	5.8	27.0
2017 Q2	39.2	43.3	-4.8	0.7	0.0	55.4	66.2	-20.3	9.9	-0.3	14.0	5.3	10.7
Q3	35.1	41.7	-5.8	0.3	-1.1	66.0	75.1	-16.7	8.0	-0.3	12.1	4.8	16.2
Q4	23.5	16.6	1.2	1.5	4.2	47.6	65.2	-21.8	5.5	-1.3	42.2	2.1	-8.9
2018 Q1	16.6	34.0	-12.7	-2.7	-1.9	75.8	83.9	-18.5	9.5	0.9	-18.1	7.6	3.0
2017 Nov.	17.9	13.2	2.0	0.3	2.4	2.2	9.1	-7.0	0.3	-0.2	52.4	5.6	-6.5
Dec.	-4.2	-11.0	5.2	0.1	1.5	8.2	16.7	-6.8	-0.4	-1.4	22.6	-5.1	-2.4
2018 Jan.	44.7	39.5	6.2	-2.1	1.1	30.8	27.9	-5.0	6.9	1.0	-20.8	1.6	2.8
Feb.	-19.3	-12.4	-5.6	0.3	-1.7	28.9	35.0	-7.6	1.4	0.1	-6.4	3.9	0.9
Mar.	-8.7	6.8	-13.3	-0.9	-1.3	16.1	21.1	-5.9	1.2	-0.3	9.1	2.1	-0.6
Apr. [p]	11.2	17.3	-4.5	-1.6	0.1	29.9	27.2	-3.7	6.1	0.3	-38.4	1.8	6.9
Growth rates													
2015	4.6	9.0	-9.2	4.4	-57.6	3.5	11.0	-13.6	0.1	-13.2	10.2	-0.2	8.8
2016	6.7	10.1	-7.5	0.2	2.1	5.2	10.9	-6.7	0.6	-29.9	3.1	-13.0	5.2
2017	8.6	11.2	-1.0	0.0	13.8	4.2	8.9	-12.7	1.7	-65.9	5.6	3.0	7.0
2017 Q2	8.1	11.5	-4.3	-1.6	-21.4	4.8	10.7	-12.3	1.3	-25.3	3.2	-6.2	6.1
Q3	8.1	12.2	-7.3	-1.8	-42.3	4.6	9.9	-12.5	1.6	-25.3	5.7	-2.0	9.0
Q4	8.6	11.2	-1.0	0.0	13.8	4.2	8.9	-12.7	1.7	-65.9	5.6	3.0	7.0
2018 Q1	5.3	8.0	-7.4	-0.1	17.8	4.0	8.3	-12.5	1.6	-42.2	5.2	10.4	5.4
2017 Nov.	8.5	12.0	-5.7	-0.1	-4.9	4.4	9.3	-12.7	1.7	-17.5	6.2	1.1	7.6
Dec.	8.6	11.2	-1.0	0.0	13.8	4.2	8.9	-12.7	1.7	-65.9	5.6	3.0	7.0
2018 Jan.	8.5	10.8	-0.5	-0.4	48.4	4.1	8.6	-12.5	1.7	-37.1	7.3	4.9	5.4
Feb.	6.8	9.0	-2.9	0.2	31.1	4.2	8.7	-12.5	1.7	-33.3	7.0	6.0	5.7
Mar.	5.3	8.0	-7.4	-0.1	17.8	4.0	8.3	-12.5	1.6	-42.2	5.2	10.4	5.4
Apr. [p]	5.6	8.4	-7.6	-0.5	13.2	4.1	8.4	-11.9	1.7	-40.6	1.7	7.1	5.6

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												
2015	3,901.3	1,113.5	2,785.4	12,599.8	10,509.7	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	12,877.7	10,708.3	10,979.2	4,313.5	5,447.3	834.7	112.7	1,385.4	784.0
2017	4,631.1	1,032.5	3,584.7	13,114.0	10,872.5	11,169.8	4,325.1	5,597.8	840.8	108.8	1,440.1	801.5
2017 Q2	4,463.8	1,064.5	3,385.1	13,001.0	10,766.8	11,050.4	4,302.0	5,520.2	831.9	112.7	1,437.8	796.4
Q3	4,548.2	1,050.5	3,483.6	13,049.0	10,816.1	11,103.7	4,305.0	5,554.6	844.7	111.9	1,439.0	794.0
Q4	4,631.1	1,032.5	3,584.7	13,114.0	10,872.5	11,169.8	4,325.1	5,597.8	840.8	108.8	1,440.1	801.5
2018 Q1	4,600.8	1,021.1	3,565.9	13,198.0	10,947.9	11,236.9	4,347.0	5,632.0	856.8	112.0	1,466.2	783.8
2017 Nov.	4,581.9	1,041.6	3,526.4	13,121.6	10,888.7	11,170.0	4,344.5	5,581.1	848.1	115.0	1,427.1	805.8
Dec.	4,631.1	1,032.5	3,584.7	13,114.0	10,872.5	11,169.8	4,325.1	5,597.8	840.8	108.8	1,440.1	801.5
2018 Jan.	4,597.3	1,031.1	3,552.0	13,187.7	10,933.5	11,230.6	4,353.4	5,604.3	863.3	112.5	1,453.3	800.9
Feb.	4,598.8	1,023.2	3,561.3	13,188.8	10,936.6	11,225.4	4,349.3	5,615.0	858.5	113.8	1,459.4	792.7
Mar.	4,600.8	1,021.1	3,565.9	13,198.0	10,947.9	11,236.9	4,347.0	5,632.0	856.8	112.0	1,466.2	783.8
Apr. [p]	4,595.7	1,020.9	3,560.3	13,254.3	10,968.5	11,261.7	4,360.1	5,642.8	847.7	117.9	1,482.9	802.9
Transactions												
2015	295.3	-21.0	316.0	82.9	55.9	76.0	-15.0	98.5	-22.0	-5.7	25.6	1.5
2016	488.3	-34.6	522.8	317.1	234.2	258.2	81.5	120.3	43.6	-11.1	78.8	4.1
2017	289.5	-43.1	331.9	361.8	272.9	316.3	81.9	173.7	20.9	-3.6	64.0	24.9
2017 Q2	34.0	-5.4	39.4	55.6	24.5	49.4	0.5	34.6	-10.6	0.0	19.3	11.8
Q3	88.6	-10.8	99.5	74.6	76.2	86.7	21.2	40.8	14.9	-0.7	2.3	-3.9
Q4	89.8	-15.9	105.6	88.4	75.8	93.7	33.8	48.8	-3.7	-3.0	5.8	6.8
2018 Q1	-39.6	-10.6	-28.9	116.4	103.1	97.3	40.5	39.7	19.6	3.3	28.7	-15.4
2017 Nov.	21.0	-1.2	22.2	44.1	35.7	32.7	15.8	18.8	-1.8	2.9	0.3	8.1
Dec.	64.5	-9.0	73.4	5.8	-4.3	16.2	-9.4	18.7	-7.4	-6.2	14.2	-4.1
2018 Jan.	-29.9	-0.7	-29.5	83.3	70.2	68.1	33.5	7.7	25.4	3.7	14.8	-1.6
Feb.	2.5	-7.7	10.1	1.9	0.7	-3.5	-5.9	10.9	-5.6	1.3	6.5	-5.3
Mar.	-12.1	-2.2	-9.5	31.1	32.2	32.7	12.9	21.1	-0.2	-1.7	7.4	-8.4
Apr. [p]	-3.7	-0.2	-4.1	46.3	15.8	18.3	12.8	11.4	-14.3	5.8	16.6	13.9
Growth rates												
2015	8.2	-1.8	12.8	0.7	0.5	0.7	-0.3	1.9	-2.7	-4.4	2.0	0.2
2016	12.5	-3.1	18.7	2.5	2.2	2.4	1.9	2.3	5.6	-9.0	6.0	0.5
2017	6.6	-4.0	10.2	2.8	2.6	2.9	1.9	3.2	2.5	-3.2	4.6	3.2
2017 Q2	8.2	-3.8	12.6	3.1	2.3	2.5	1.2	2.9	3.7	8.4	7.2	6.4
Q3	8.3	-4.0	12.7	2.8	2.4	2.7	1.5	3.0	3.6	2.0	5.6	2.6
Q4	6.6	-4.0	10.2	2.8	2.6	2.9	1.9	3.2	2.5	-3.2	4.6	3.2
2018 Q1	3.9	-4.0	6.4	2.6	2.6	3.0	2.2	3.0	2.4	-0.4	4.0	-0.1
2017 Nov.	6.8	-3.7	10.4	2.8	2.5	2.9	1.8	3.1	3.2	0.1	3.9	4.4
Dec.	6.6	-4.0	10.2	2.8	2.6	2.9	1.9	3.2	2.5	-3.2	4.6	3.2
2018 Jan.	5.4	-4.4	8.7	3.1	2.9	3.3	2.3	3.1	5.6	-1.2	4.7	2.3
Feb.	5.2	-4.1	8.2	2.8	2.7	3.1	2.0	2.9	4.5	2.0	5.0	1.1
Mar.	3.9	-4.0	6.4	2.6	2.6	3.0	2.2	3.0	2.4	-0.4	4.0	-0.1
Apr. [p]	3.2	-4.1	5.5	3.0	2.8	3.1	2.4	3.0	3.2	3.7	5.1	1.8

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										
2015	4,290.2	4,272.8	1,043.1	761.8	2,485.2	5,308.7	5,641.5	595.4	3,949.4	763.9
2016	4,313.5	4,313.1	1,002.2	797.7	2,513.6	5,447.3	5,727.2	615.6	4,083.3	748.4
2017	4,325.1	4,365.2	976.7	820.5	2,527.8	5,597.8	5,865.5	653.3	4,214.4	730.1
2017 Q2	4,302.0	4,316.2	990.9	798.7	2,512.5	5,520.2	5,798.9	635.3	4,147.7	737.2
Q3	4,305.0	4,326.2	978.3	812.4	2,514.3	5,554.6	5,828.8	644.7	4,179.0	730.9
Q4	4,325.1	4,365.2	976.7	820.5	2,527.8	5,597.8	5,865.5	653.3	4,214.4	730.1
2018 Q1	4,347.0	4,384.2	1,002.6	820.2	2,524.3	5,632.0	5,905.4	663.1	4,242.1	726.9
2017 Nov.	4,344.5	4,365.7	987.9	822.7	2,533.9	5,581.1	5,853.1	652.2	4,197.5	731.4
Dec.	4,325.1	4,365.2	976.7	820.5	2,527.8	5,597.8	5,865.5	653.3	4,214.4	730.1
2018 Jan.	4,353.4	4,388.1	996.7	826.5	2,530.2	5,604.3	5,880.3	659.5	4,215.8	729.0
Feb.	4,349.3	4,382.2	988.9	824.9	2,535.5	5,615.0	5,892.2	662.3	4,224.0	728.8
Mar.	4,347.0	4,384.2	1,002.6	820.2	2,524.3	5,632.0	5,905.4	663.1	4,242.1	726.9
Apr. [p]	4,360.1	4,396.7	1,004.7	823.1	2,532.3	5,642.8	5,917.2	667.0	4,249.9	725.9
Transactions										
2015	-15.0	22.8	-62.2	31.9	15.3	98.5	76.9	21.8	80.2	-3.6
2016	81.5	98.7	-17.3	44.2	54.6	120.3	114.4	23.9	105.6	-9.2
2017	81.9	132.7	1.1	36.6	44.1	173.7	166.7	44.0	134.1	-4.4
2017 Q2	0.5	11.2	-2.4	2.3	0.6	34.6	40.1	10.3	24.9	-0.5
Q3	21.2	33.1	-6.0	17.1	10.1	40.8	36.3	10.7	33.3	-3.2
Q4	33.8	57.1	3.0	10.8	19.9	48.8	46.5	11.9	36.7	0.2
2018 Q1	40.5	38.8	31.0	4.4	5.1	39.7	46.3	11.5	27.3	0.8
2017 Nov.	15.8	17.4	-2.5	6.9	11.4	18.8	16.6	6.3	11.4	1.1
Dec.	-9.4	11.6	-8.4	-0.7	-0.3	18.7	17.2	2.1	17.6	-1.0
2018 Jan.	33.5	26.1	22.5	7.3	3.7	7.7	16.0	6.1	1.8	-0.3
Feb.	-5.9	-4.8	-9.1	-1.7	5.0	10.9	12.8	3.1	7.5	0.4
Mar.	12.9	17.5	17.7	-1.2	-3.6	21.1	17.5	2.3	18.1	0.8
Apr. [p]	12.8	12.4	2.1	2.7	8.0	11.4	11.1	5.7	7.4	-1.7
Growth rates										
2015	-0.3	0.5	-5.6	4.4	0.6	1.9	1.4	3.9	2.1	-0.5
2016	1.9	2.3	-1.7	5.8	2.2	2.3	2.0	4.0	2.7	-1.2
2017	1.9	3.1	0.1	4.6	1.8	3.2	2.9	7.2	3.3	-0.6
2017 Q2	1.2	2.0	-2.5	3.8	2.0	2.9	2.6	6.0	3.2	-1.1
Q3	1.5	2.5	-1.2	4.3	1.7	3.0	2.7	6.9	3.2	-1.1
Q4	1.9	3.1	0.1	4.6	1.8	3.2	2.9	7.2	3.3	-0.6
2018 Q1	2.2	3.3	2.6	4.3	1.4	3.0	2.9	7.1	3.0	-0.4
2017 Nov.	1.8	3.1	-1.0	4.8	2.0	3.1	2.8	7.3	3.1	-0.8
Dec.	1.9	3.1	0.1	4.6	1.8	3.2	2.9	7.2	3.3	-0.6
2018 Jan.	2.3	3.4	1.2	5.3	1.8	3.1	2.9	7.4	3.1	-0.8
Feb.	2.0	3.2	0.4	5.2	1.7	2.9	2.9	7.5	2.9	-0.6
Mar.	2.2	3.3	2.6	4.3	1.4	3.0	2.9	7.1	3.0	-0.4
Apr. [p]	2.4	3.3	3.2	4.3	1.5	3.0	2.9	7.6	2.9	-0.5

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									
2015	284.7	6,999.2	2,119.4	80.0	2,255.8	2,543.9	1,350.6	284.6	205.9	135.6
2016	314.2	6,956.8	2,090.9	70.9	2,146.7	2,648.4	1,136.9	261.8	205.9	121.6
2017	356.2	6,742.7	1,968.9	59.7	2,016.1	2,698.0	934.6	284.1	143.9	93.6
2017 Q2	305.7	6,800.8	2,035.7	66.8	2,066.7	2,631.6	1,028.3	248.6	154.2	109.7
Q3	365.3	6,730.6	2,007.3	61.5	2,015.9	2,645.8	1,022.3	262.1	140.6	85.4
Q4	356.2	6,742.7	1,968.9	59.7	2,016.1	2,698.0	934.6	284.1	143.9	93.6
2018 Q1	339.6	6,722.1	1,952.4	59.4	2,020.1	2,690.2	910.0	292.2	136.2	88.3
2017 Nov.	308.9	6,696.4	1,965.1	60.1	2,016.4	2,654.8	952.0	208.7	167.6	132.7
Dec.	356.2	6,742.7	1,968.9	59.7	2,016.1	2,698.0	934.6	284.1	143.9	93.6
2018 Jan.	316.2	6,728.7	1,960.1	60.5	2,022.5	2,685.7	821.5	344.7	133.2	85.3
Feb.	346.9	6,715.4	1,958.4	59.8	2,016.0	2,681.1	841.1	344.5	125.0	82.9
Mar.	339.6	6,722.1	1,952.4	59.4	2,020.1	2,690.2	910.0	292.2	136.2	88.3
Apr. [p]	349.7	6,738.0	1,955.1	59.3	2,018.9	2,704.8	879.6	330.1	147.4	154.5
	Transactions									
2015	8.9	-216.2	-106.3	-13.5	-215.4	118.9	-86.7	-12.7	21.4	-4.0
2016	26.7	-113.7	-69.6	-9.1	-110.4	75.4	-276.1	-76.8	12.8	-12.0
2017	45.7	-86.2	-84.7	-8.7	-72.5	79.7	-97.3	-70.7	-60.7	-27.3
2017 Q2	-2.6	-12.0	-24.8	-2.4	-2.7	18.0	-11.7	3.0	-28.9	-2.1
Q3	64.9	-24.7	-25.5	-2.9	-31.1	34.7	24.8	15.9	-13.6	-24.3
Q4	-9.1	-36.0	-17.7	-1.8	-11.0	-5.4	-75.6	-61.1	3.4	8.2
2018 Q1	-16.5	11.2	-16.1	-1.3	12.0	16.6	60.5	-59.9	-7.8	-5.3
2017 Nov.	-33.0	-3.3	2.3	-0.7	-7.3	2.4	0.2	-34.2	9.3	23.2
Dec.	47.3	-5.2	4.8	-0.5	5.3	-14.8	-10.9	-7.9	-23.7	-39.1
2018 Jan.	-39.8	15.5	-6.8	-0.6	19.9	3.0	-27.6	3.4	-10.7	-8.3
Feb.	30.6	-23.1	-3.7	-0.4	-16.3	-2.8	10.3	-9.7	-8.2	-2.4
Mar.	-7.3	18.8	-5.6	-0.4	8.4	16.4	77.9	-53.7	11.2	5.4
Apr. [p]	10.1	1.6	1.8	-0.2	-10.2	10.2	-38.7	33.2	-10.5	-12.0
	Growth rates									
2015	3.5	-3.0	-4.8	-14.4	-8.8	4.8	-	-	11.6	-2.9
2016	9.4	-1.6	-3.3	-11.5	-4.9	2.9	-	-	6.3	-9.0
2017	14.4	-1.3	-4.1	-12.4	-3.5	3.0	-	-	-29.6	-22.6
2017 Q2	-7.7	-1.2	-4.0	-10.9	-3.7	3.5	-	-	-30.7	-22.6
Q3	22.0	-0.9	-4.1	-12.5	-3.5	4.2	-	-	-31.2	-33.4
Q4	14.4	-1.3	-4.1	-12.4	-3.5	3.0	-	-	-29.6	-22.6
2018 Q1	11.8	-0.9	-4.1	-12.5	-1.6	2.4	-	-	-25.6	-21.0
2017 Nov.	4.0	-1.3	-4.6	-12.7	-3.8	3.5	-	-	-13.1	10.0
Dec.	14.4	-1.3	-4.1	-12.4	-3.5	3.0	-	-	-29.6	-22.6
2018 Jan.	5.1	-0.9	-4.0	-12.4	-2.3	3.1	-	-	-24.5	-19.8
Feb.	16.9	-1.3	-3.7	-12.6	-2.8	2.0	-	-	-27.0	-20.5
Mar.	11.8	-0.9	-4.1	-12.5	-1.6	2.4	-	-	-25.6	-21.0
Apr. [p]	7.3	-0.7	-3.7	-12.8	-1.7	2.6	-	-	-28.3	-26.4

Source: ECB.

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

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

3) Not adjusted for seasonal effects.

6 Fiscal developments

6.1 Deficit/surplus

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

	Deficit (-)/surplus (+)					Memo item: Primary deficit (-)/ surplus (+)
	Total	Central government	State government	Local government	Social security funds	
	1	2	3	4	5	6
2014	-2.5	-2.1	-0.2	0.0	-0.1	0.1
2015	-2.0	-1.9	-0.2	0.2	-0.1	0.3
2016	-1.5	-1.7	-0.1	0.2	0.0	0.6
2017	-0.9	-1.3	0.1	0.2	0.1	1.1
2017 Q1	-1.3	.	.	.	.	0.9
Q2	-1.2	.	.	.	.	0.8
Q3	-1.0	.	.	.	.	1.0
Q4	-0.9	.	.	.	.	1.1

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

6.2 Revenue and expenditure

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

	Revenue						Expenditure						
	Total	Current revenue				Capital revenue	Total	Current expenditure					Capital expenditure
			Direct taxes	Indirect taxes	Net social contributions				Compen-sation of employees	Intermediate consumption	Interest	Social benefits	
	1	2	3	4	5	6	7	8	9	10	11	12	13
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	4.0
2015	46.3	45.7	12.6	13.0	15.2	0.5	48.3	44.4	10.0	5.2	2.3	22.7	3.9
2016	46.1	45.7	12.6	13.0	15.3	0.5	47.6	44.0	10.0	5.2	2.1	22.8	3.5
2017	46.2	45.8	12.9	13.0	15.3	0.4	47.1	43.3	9.9	5.1	2.0	22.5	3.7
2017 Q1	46.2	45.7	12.7	13.0	15.3	0.5	47.4	43.9	9.9	5.2	2.1	22.7	3.6
Q2	46.2	45.8	12.7	13.0	15.3	0.4	47.4	43.8	9.9	5.1	2.1	22.7	3.6
Q3	46.2	45.8	12.8	13.0	15.3	0.4	47.2	43.5	9.9	5.1	2.0	22.6	3.7
Q4	46.2	45.8	12.9	13.0	15.3	0.4	47.1	43.3	9.9	5.1	2.0	22.5	3.7

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
2014	91.9	2.7	17.1	72.0	44.0	25.6	47.9	10.0	81.9	18.8	31.9	41.2	89.8	2.1
2015	89.9	2.8	16.2	71.0	44.1	27.1	45.8	9.3	80.6	17.6	31.2	41.1	87.9	2.0
2016	89.0	2.7	15.5	70.8	46.1	30.4	42.9	9.0	80.0	17.2	29.9	41.9	87.0	2.0
2017	86.7	2.6	14.3	69.8	46.7	31.8	40.1	8.3	78.5	16.0	28.8	41.9	84.9	1.8
2017 Q1	89.2	2.6	15.2	71.4	.	.	.	.	.	.	.	.	.	.
Q2	89.1	2.7	14.9	71.4	.	.	.	.	.	.	.	.	.	.
Q3	88.1	2.8	14.7	70.7	.	.	.	.	.	.	.	.	.	.
Q4	86.7	2.6	14.3	69.8	.	.	.	.	.	.	.	.	.	.

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

6 Fiscal developments

6.4 Annual change in the government debt-to-GDP ratio and underlying factors [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
2014	0.3	-0.1	-0.2	-0.5	0.2	-0.5	-0.3	0.0	0.1	0.2	0.6	2.2
2015	-1.9	-0.3	-0.8	-0.5	0.2	-0.2	-0.3	-0.1	0.0	-0.3	-0.8	1.3
2016	-1.0	-0.6	-0.2	0.3	0.3	-0.1	0.0	0.1	-0.3	-0.2	-0.1	1.6
2017	-2.3	-1.1	-0.1	0.4	0.4	0.1	-0.2	0.1	-0.1	-0.5	-1.0	0.8
2017 Q1	-1.7	-0.9	-0.5	-0.1	-0.1	-0.1	-0.1	0.1	-0.3	-0.1	-0.4	1.0
Q2	-1.8	-0.8	-0.6	-0.4	-0.2	-0.1	-0.1	0.1	-0.2	0.0	-0.4	0.8
Q3	-1.6	-1.0	0.1	0.7	0.8	-0.1	-0.1	0.1	-0.1	-0.5	-0.7	1.2
Q4	-2.3	-1.1	-0.1	0.4	0.4	0.1	-0.2	0.1	-0.1	-0.5	-1.0	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
2015	14.7	12.8	4.3	1.9	0.5	6.6	2.9	1.4	0.1	3.3	3.0	0.4	1.2
2016	14.1	12.4	4.6	1.7	0.4	6.9	2.6	1.2	-0.1	3.0	2.9	0.2	1.2
2017	12.9	11.2	4.2	1.7	0.4	7.1	2.4	1.1	-0.2	2.8	2.3	0.3	1.1
2017 Q1	13.9	12.2	4.2	1.7	0.4	6.9	2.6	1.2	-0.2	3.0	2.9	0.2	1.1
Q2	13.8	12.1	4.3	1.7	0.4	7.0	2.5	1.2	-0.2	2.9	2.6	0.2	1.2
Q3	13.0	11.3	3.8	1.7	0.4	7.1	2.5	1.1	-0.2	2.9	2.5	0.2	1.1
Q4	12.9	11.2	4.2	1.7	0.4	7.1	2.4	1.1	-0.2	2.8	2.3	0.3	1.1
2017 Nov.	12.9	11.2	3.8	1.7	0.4	7.2	2.4	1.1	-0.2	2.8	2.4	0.2	1.2
Dec.	12.9	11.2	4.2	1.7	0.4	7.1	2.4	1.1	-0.2	2.8	2.3	0.3	1.1
2018 Jan.	12.7	11.1	4.2	1.6	0.4	7.2	2.4	1.1	-0.2	2.8	2.2	0.4	1.2
Feb.	12.7	11.1	4.1	1.6	0.4	7.2	2.4	1.1	-0.2	2.8	2.4	0.4	1.2
Mar.	13.0	11.4	4.2	1.6	0.4	7.2	2.4	1.1	-0.2	2.8	2.5	0.4	1.1
Apr.	12.8	11.2	3.9	1.6	0.4	7.3	2.4	1.1	-0.2	2.8	2.4	0.4	1.1

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 (+)								
2014	-3.1	0.5	0.7	-3.6	-3.6	-6.0	-3.9	-3.0	-9.0
2015	-2.5	0.8	0.1	-1.9	-5.7	-5.3	-3.6	-2.6	-1.3
2016	-2.5	1.0	-0.3	-0.5	0.6	-4.5	-3.4	-2.5	0.3
2017	-1.0	1.3	-0.3	-0.3	0.8	-3.1	-2.6	-2.3	1.8
2017 Q1	-2.0	1.2	-0.4	-0.4	1.1	-4.2	-3.3	-2.2	0.4
Q2	-1.6	1.0	-0.7	-0.5	1.1	-3.6	-3.2	-2.5	0.8
Q3	-1.3	1.3	-0.7	-0.6	1.1	-3.2	-3.0	-2.4	1.8
Q4	-1.0	1.3	-0.3	-0.3	0.8	-3.1	-2.6	-2.3	1.8
	Government debt								
2014	107.0	74.7	10.7	104.5	178.9	100.4	94.9	131.8	107.5
2015	106.1	71.0	10.0	76.9	176.8	99.4	95.6	131.5	107.5
2016	105.9	68.2	9.4	72.8	180.8	99.0	96.6	132.0	106.6
2017	103.1	64.1	9.0	68.0	178.6	98.3	97.0	131.8	97.5
2017 Q1	107.4	66.7	9.2	74.8	177.7	99.7	98.9	133.8	106.0
Q2	106.1	66.1	8.9	74.1	176.1	99.5	99.3	134.9	105.7
Q3	106.9	65.2	8.9	72.0	177.4	98.5	98.4	134.2	102.5
Q4	103.1	64.1	9.0	68.0	178.6	98.3	97.0	131.8	97.5

	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Austria	Portugal	Slovenia	Slovakia	Finland
	10	11	12	13	14	15	16	17	18	19
	Government deficit (-)/surplus (+)									
2014	-1.5	-0.6	1.3	-1.8	-2.3	-2.7	-7.2	-5.5	-2.7	-3.2
2015	-1.4	-0.2	1.4	-1.1	-2.1	-1.0	-4.4	-2.9	-2.7	-2.8
2016	0.1	0.3	1.6	1.0	0.4	-1.6	-2.0	-1.9	-2.2	-1.8
2017	-0.5	0.5	1.5	3.9	1.1	-0.7	-3.0	0.0	-1.0	-0.6
2017 Q1	-0.3	0.8	0.8	2.0	1.0	-0.9	-3.8	-1.3	-2.0	-1.5
Q2	0.3	0.7	1.0	2.1	1.1	-1.2	-3.5	-1.0	-1.6	-1.0
Q3	0.1	0.9	1.4	3.3	1.2	-0.9	-2.4	-0.5	-1.6	-1.1
Q4	-0.5	0.5	1.5	3.9	1.1	-0.7	-3.0	0.0	-1.0	-0.6
	Government debt									
2014	40.9	40.5	22.7	63.8	68.0	84.0	130.6	80.3	53.5	60.2
2015	36.8	42.6	22.0	58.7	64.6	84.6	128.8	82.6	52.3	63.5
2016	40.5	40.1	20.8	56.2	61.8	83.6	129.9	78.6	51.8	63.0
2017	40.1	39.7	23.0	50.8	56.7	78.4	125.7	73.6	50.9	61.4
2017 Q1	39.3	39.2	23.9	56.6	59.5	81.7	130.1	80.3	53.3	62.7
Q2	39.9	41.7	23.4	55.0	58.6	81.4	131.7	79.8	51.7	61.7
Q3	38.2	39.4	23.4	53.4	56.9	80.2	130.5	78.5	51.3	60.5
Q4	40.1	39.7	23.0	50.8	56.7	78.4	125.7	73.6	50.9	61.4

Source: Eurostat.

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