EUROPEAN CENTRAL BANK

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Economic and monetary developments

Overview

At its monetary policy meeting on 13 September, the Governing Council concluded that the incoming information, including the September 2018 ECB staff projections, broadly confirms the Governing Council's previous assessment of an ongoing broad-based expansion of the euro area economy and gradually rising inflation. The underlying strength of the economy continues to support the Governing Council's confidence that the sustained convergence of inflation to its aim will proceed and will be maintained even after a gradual winding-down of the net asset purchases. At the same time, uncertainties relating to rising protectionism, vulnerabilities in emerging markets and financial market volatility have gained more prominence recently. Therefore, 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 its aim in a sustained manner.

Economic and monetary assessment at the time of the Governing Council meeting of 13 September 2018

While the global economy maintained a steady pace in the first half of 2018, momentum is expected to moderate. Advanced economies continue to benefit from accommodative monetary policies and the US fiscal stimulus, while activity among commodity exporters has also been bolstered by the recovery in commodity prices over the past year. However, financial conditions have tightened, particularly for some emerging markets. Moreover, global trade growth has slowed and uncertainties about future trading relations have risen. Over the medium term, global economic activity is expected to expand at a pace close to potential growth, with output gaps already closed or closing in most advanced economies. Global inflationary pressures are expected to rise slowly as spare capacity diminishes.

In financial markets, euro area long-term risk-free rates have been broadly unchanged since the Governing Council's meeting in June 2018. Sovereign bond spreads have been volatile against a background of sustained political uncertainty in Italy. Although corporate earnings remain robust, equity and bond prices of euro area financial corporations have declined amid geopolitical uncertainty and rising volatility in some emerging markets. In foreign exchange markets, the euro has broadly strengthened in trade-weighted terms.

The latest economic indicators and survey results confirm ongoing broad-based growth of the euro area economy, despite some moderation following the strong growth performance in 2017. Euro area real GDP increased by 0.4%, quarter on quarter, in the second quarter of 2018, the same rate as in the previous quarter. The ECB's monetary policy measures continue to underpin domestic demand. Private consumption is supported by ongoing employment gains, which, in turn, partly reflect past labour market reforms, and by rising wages. Business investment is fostered by the favourable financing conditions, rising corporate profitability and solid demand. Housing investment remains robust. In addition, the expansion in global activity is expected to continue, supporting euro area exports.

The September 2018 ECB staff macroeconomic projections for the euro area foresee annual real GDP increasing by 2.0% in 2018, 1.8% in 2019 and 1.7% in 2020. Compared with the June 2018 Eurosystem staff macroeconomic projections, the outlook for real GDP growth has been revised down slightly for 2018 and 2019, mainly due to a weaker contribution from foreign demand. Although risks relating to rising protectionism, vulnerabilities in emerging markets and financial market volatility have gained more prominence recently, the risks surrounding the euro area growth outlook can still be assessed as broadly balanced overall.

According to Eurostat's flash estimate, euro area annual HICP inflation was 2.0% in August 2018, down from 2.1% in July. Looking ahead, on the basis of current futures prices for oil, annual rates of headline inflation are likely to hover around current levels 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 and broadening amid high levels of capacity utilisation and tightening labour markets, which is pushing up wage growth. 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 and rising wage growth.

This assessment is also broadly reflected in the September 2018 ECB staff macroeconomic projections for the euro area, which foresee annual HICP inflation at 1.7% in 2018, 2019 and 2020. The outlook for HICP inflation is unchanged compared with the June 2018 Eurosystem staff macroeconomic projections. HICP inflation excluding energy and food is projected to rise gradually from 1.1% in 2018 to 1.5% in 2019 and 1.8% in 2020.

The aggregate fiscal stance for the euro area is projected to be broadly neutral in 2018, mildly expansionary in 2019, and broadly neutral again in 2020. Overall, the euro area budget deficit is expected to decline further over the projection horizon, mainly as a result of favourable cyclical conditions and declining interest payments. Although the euro area government debt-to-GDP ratio will continue to decline, it will remain elevated.

Broad money (M3) growth moderated in the context of reduced monthly net asset purchases under the asset purchase programme (APP). M3 grew by 4.0% in July 2018, after 4.5% in June. Apart from some volatility in monthly flows, M3 growth is increasingly supported by bank credit creation. The narrow monetary aggregate M1

remained the main contributor to broad money growth. The recovery in the growth of loans to the private sector observed since the beginning of 2014 is proceeding. The annual growth rate of loans to non-financial corporations (NFCs) stood at 4.1% in July 2018, while the annual growth rate of loans to households stood at 3.0%, both unchanged from June. The pass-through of the monetary policy measures put in place since June 2014 continues to significantly support borrowing conditions for firms and households, access to financing – in particular for small and medium-sized enterprises – and credit flows across the euro area. The flow of total external financing to euro area NFCs increased considerably in the second quarter of 2018.

Monetary policy decisions

Based on the regular economic and monetary analyses, the Governing Council made the following decisions. First, the Governing Council decided to keep the key ECB interest rates unchanged and continues to expect 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 the continued sustained convergence of inflation to levels that are below, but close to, 2% over the medium term. Second, 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. After September 2018, the monthly pace of the net asset purchases will be reduced to €15 billion until the end of December 2018. The Governing Council anticipates that, subject to incoming data confirming its medium-term inflation outlook, net purchases will then end. Third, the Governing Council intends to reinvest the principal payments from maturing securities purchased under the APP for an extended period of time after the end of the net asset purchases, and in any case for as long as necessary to maintain favourable liquidity conditions and an ample degree of monetary accommodation.

1 External environment

While the global economy maintained a steady pace in the first half of 2018, momentum is expected to moderate amid mounting risks and uncertainties related to rising protectionism, vulnerabilities in emerging markets and financial market volatility. Advanced economies continue to benefit from accommodative monetary policies and the US fiscal stimulus, while activity among commodity exporters has also been bolstered by the recovery in commodity prices over the past year. However, financial conditions have tightened, particularly for some emerging markets. Moreover, global trade growth has slowed and uncertainties about future trading relations have risen. Over the medium term, global economic activity is expected to expand at a pace close to potential growth. Output gaps are already closed or closing in most advanced economies, policy support will gradually diminish and China is transitioning to a lower growth path. Global inflationary pressures are expected to rise slowly as spare capacity diminishes. Risks to global activity are skewed to the downside.

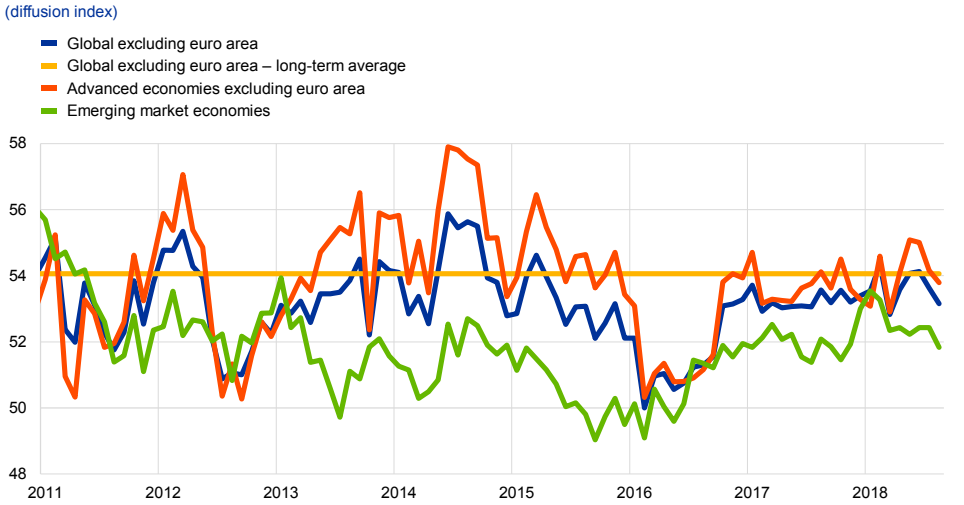
Global economic activity and trade

Despite mounting risks and uncertainties, the global economy continued to expand at a steady pace in the first half of 2018. Having moderated in the first quarter, activity growth rebounded strongly in the second quarter in the United States and Japan. GDP growth also recovered modestly in the United Kingdom. Across emerging market economies (EMEs), activity was supported by continued rapid expansion in India and China. Momentum revived in Russia in the first half of this year, buoyed by the rise in oil prices, but weakened in Brazil, where disruptions associated with strikes and political uncertainty hit confidence.

Surveys suggest global activity momentum might moderate somewhat. Global manufacturing has moderated in the past few months and the global composite output Purchasing Managers' Index (PMI) excluding the euro area declined somewhat below its long-term average in August (Chart 1). However, consumer confidence indicators remain particularly upbeat, despite the recent declines.

Chart 1

Global composite output PMI



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

Further tariff increases and uncertainties about future trading relations are likely to weigh on global economic momentum going forward. In the past three months, the United States has enacted further tariff increases. The exemptions that had initially shielded the EU, Canada and Mexico from the tariff increases on steel and aluminium imports expired in June. Affected countries have announced retaliation measures. In addition, tariffs related to Section 301 of the 1974 US Trade Act – directed at concerns about technology transfers to China – took effect in July and August, affecting in total USD 50 billion of Chinese exports to the United States, and China retaliated with tariff increases on a similar value of US exports. Although the tariffs implemented so far affect a relatively small proportion of global trade, tensions over trade are high, which has heightened uncertainty about the outlook. Strains in US-Chinese trade relations remain, with the US Administration preparing a list of an additional USD 200 billion in imports from China to be targeted in a second round of tariffs, the announcement of which was imminent at the time of the September Governing Council meeting.[1] The United States has also initiated an investigation into auto sector trade to determine its national security implications.

A mix of concerns over trade, the gradual normalisation of monetary policies in advanced economies, and policy uncertainties in some EMEs have led to heightened tensions in financial markets in recent months. The gradual normalisation of monetary policy in the United States has continued: following the interest rate hike in June 2018, the federal funds futures curve suggests that markets anticipate further rate hikes in the coming months. The combination of rising interest rates and the stronger dollar contributed to some tightening of financial conditions across EMEs in the early summer months. Severe tensions have been observed in

1 Since the Governing Council meeting on 13 September, the US Administration has announced tariffs targeting an additional USD 200 billion of Chinese exports to the United States and China has retaliated by announcing tariffs on an additional USD 60 billion of exports from the United States, both effective as of 24 September 2018.

some EMEs, particularly Argentina and Turkey, reflecting doubts about the credibility of policy as well as high external financing requirements. While acute volatility has been limited to these countries, some spillovers to other vulnerable EMEs have been observed, with sovereign spreads rising and currencies coming under pressure.

In the near term, global economic momentum is expected to moderate. Advanced economies continue to benefit from accommodative monetary policies. A sizeable fiscal stimulus in the United States will also provide an impetus to global growth. Moreover, higher oil prices have helped stabilise investment in many oil exporting economies. However, the slowdown in global trade and rising uncertainty about future trading relations are expected to hit confidence and investment. The tightening of financial conditions in some EMEs in recent months is also expected to weigh on global momentum.

Over the medium term, global economic activity is expected to expand at a pace close to potential growth. Output gaps have already closed in many advanced economies. Moreover, policy support will gradually diminish. China's transition to a lower growth path that is less dependent on credit and fiscal stimulus will also weigh on global demand. On the other hand, the stabilisation of prospects in EMEs will provide some support for global activity further ahead. Over the medium term, the pace of global expansion is expected to settle at below pre-crisis rates.

Turning to developments across countries, in the United States activity is expected to remain strong this year. Tight labour market conditions, with historically low unemployment levels, stable participation and an upward trend on wage growth, should support household incomes and spending, while solid corporate profits and still favourable financial conditions should bolster investment. Fiscal stimulus from tax reforms and higher expenditure are expected to support the growth outlook this year and next, before fading in 2020.

In Japan, the economic expansion is projected to decelerate gradually. While activity should benefit from accommodative monetary policy, waning fiscal support and increasingly binding capacity constraints are expected to weigh on growth. Wages are rising moderately amid a tightening labour market, which should support household spending. However, inflation is projected to remain below the Bank of Japan's 2% inflation target.

In the United Kingdom, the outlook is for moderate growth as domestic demand remains subdued. As inflation moderates, private consumption should be supported, despite the uncertain economic outlook. However, uncertainty associated with Brexit negotiations is expected to affect investment in the interim.

In central and eastern European countries, GDP growth is projected to remain robust in the near term. Activity is supported by strong investment linked to EU funds, solid consumer spending and improvements in the labour market. Over the medium term, activity is expected to decelerate towards potential.

Recent data suggest that activity in China is decelerating in the near term. A slowing housing market and the lagged effects of earlier financial tightening may

weigh on growth, while higher tariffs imposed by the United States are expected to weigh on trade. However, monetary accommodation and some fiscal support should help to sustain activity growth in the near term. Over the medium term, it is assumed that continued progress on structural reforms would lead to an orderly slowdown and some rebalancing of the Chinese economy.

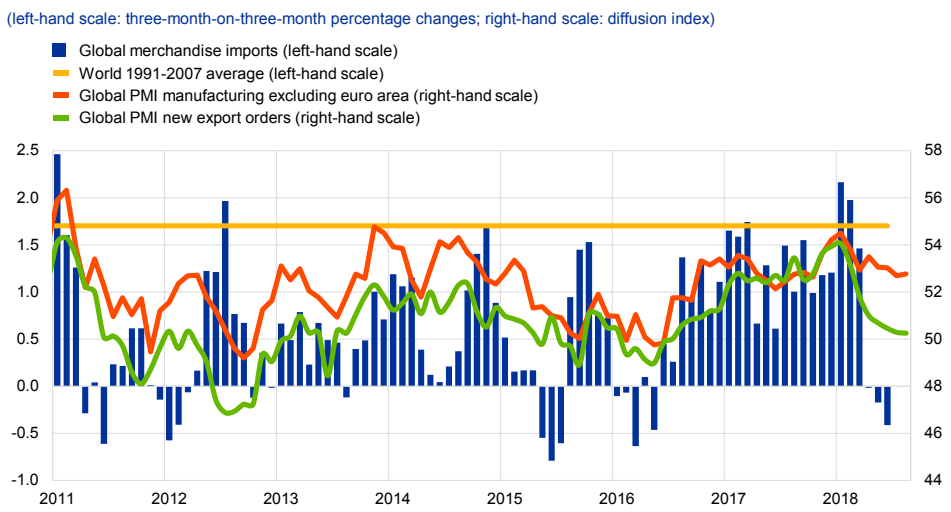
Economic activity is projected to strengthen moderately in the large commodity-exporting countries. In Russia, the outlook is supported by the rise in oil prices this year, relatively low inflation and improving business and consumer confidence. On the other hand, the recently imposed US sanctions are likely to weigh on near-term growth owing to increased political uncertainties. Over the medium term, economic activity is expected to expand moderately amid a challenging business environment, weak fixed investment and a lack of structural reforms, which is undermining Russia's growth potential. In Brazil, the short-term outlook is affected by political uncertainties and the disruptions from strikes. However, further ahead an improved labour market and continuing monetary accommodation should support consumption, as inflationary pressures remain contained.

Turkey is expected to undergo a difficult adjustment in the coming months. Rapid economic growth over the past year has led to substantial overheating. The recent depreciation of the currency, amid capital outflows and high inflationary pressures, signals a rapid deterioration in the economic environment. Indicators already point to a softening of activity, which is expected to deepen in the near term.

After strong growth in 2017, global trade indicators point to a deceleration in the first half of this year. According to CPB data, the volume of merchandise imports fell by 0.4% in June (in three-month-on-three-month terms). The picture of softening global trade is consistent with other indicators (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 August 2018 (global PMI manufacturing and global PMI new export orders) and June 2018 (trade).

In the near term, global trade is expected to remain subdued. Increased trade protectionism is expected to weigh on trade prospects. The tariffs implemented so far affect a relatively small proportion of global trade. However, while the direct trade effects of the tariff increases are small for most countries, they have heightened concerns about the broader outlook for trade policies and the global economy. This uncertainty about future trading relations is expected to hit confidence and investment, which will also weigh on global trade prospects. Over the medium term, global trade is projected to grow broadly in line with activity.

Overall, global growth is projected to decelerate over the projection horizon. According to the September 2018 ECB staff macroeconomic projections, world real GDP growth (excluding the euro area) is expected to increase to 3.9% in 2018, before declining to 3.7% in 2019 and 2020. This projection path reflects the expected slowdown in the near term in some emerging economies, as financial conditions have tightened. Further ahead, expansion in advanced economies is projected to slow towards potential growth. At the same time, the pace of expansion in China is expected to moderate gradually. Growth in euro area foreign demand is forecast to stand at 4.1% in 2018, before declining to 3.6% in 2019 and 2020. Compared with the June 2018 projections, global GDP growth has been revised downwards for 2018 and 2019, reflecting the weaker outlook in some EMEs. Growth in euro area foreign demand has also been revised downwards, reflecting the reduced momentum observed in trade data as well as the effects of weaker projected activity.

The balance of risks for global activity is skewed to the downside. 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 remain high, 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, particularly for EMEs, disruptions associated with China's reform process and geopolitical uncertainties associated, in particular, with Brexit-related risks.

Global price developments

Oil prices have been volatile in recent weeks. During the early summer months, oil prices declined as supply prospects improved with the cessation of disruptions in Libya and the prospect of increased supplies from OPEC and Russia. That meant that the oil price assumption underpinning the September ECB staff macroeconomic projections was about 7.5% lower in the short term than it had been in the previous projection. Since the cut-off date for the projections, however, the price of oil has risen again, reaching USD 80 per barrel on 12 September. The latest increase reflected market reaction to lower-than-expected crude oil inventories in the United States, which suggested a faster tightening of the market than had been expected.

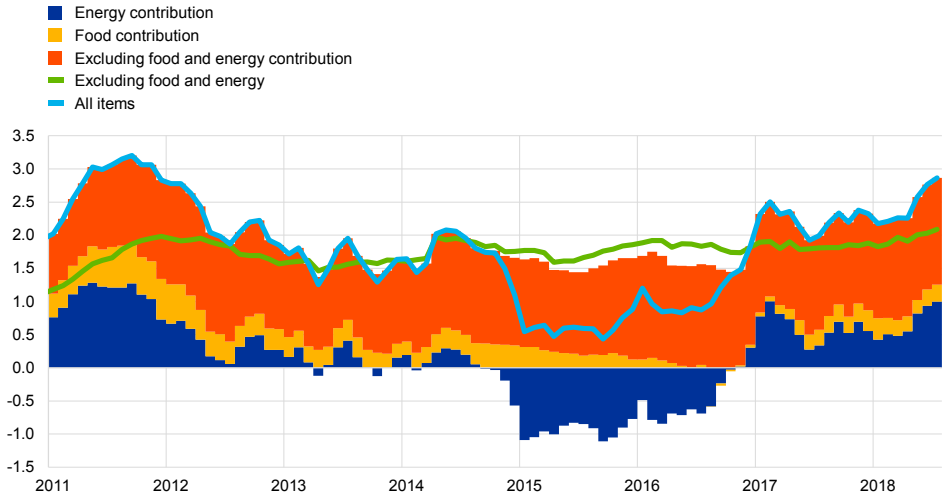
The past increase in oil prices has put upward pressure on global consumer price inflation. In the OECD area, consumer price index (CPI) inflation rose to 2.9% in July. Excluding food and energy, inflation increased slightly to 2.1%, extending a very moderate upward trend observed over the past year (Chart 3). At the same time,

despite tightening labour markets across advanced economies, wage pressures remain relatively subdued.

Chart 3

OECD consumer price inflation

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



Sources: OECD and ECB staff calculations.
Note: The latest observation is for July 2018.

Looking ahead, global inflationary pressures are expected to remain contained. In the short term, the euro area's competitors' export prices are expected to increase following the recent pick up in oil prices. Further ahead, however, the current oil futures curve anticipates a modest decline in oil prices, implying a declining contribution from energy prices to global inflation. On the other hand, diminishing spare capacity at the global level is projected to provide some upward support for inflation.

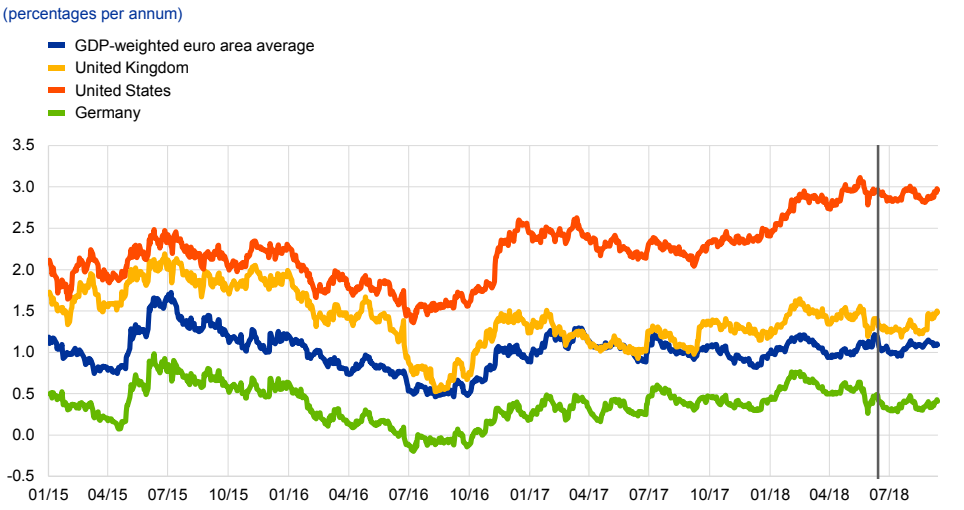
2 Financial developments

Since the Governing Council's meeting in June 2018, euro area long-term risk-free rates have remained broadly unchanged. Sovereign bond spreads have been volatile against a background of sustained political uncertainty in Italy. Although corporate earnings remain robust, equity and bond prices of euro area financial corporations have declined amid geopolitical uncertainty and rising volatility in emerging markets. In foreign exchange markets, the euro has broadly strengthened in trade-weighted terms.

Long-term yields remain broadly unchanged in the euro area and in the United States. During the period under review (from 14 June to 12 September), the euro area ten-year risk-free overnight index swap (OIS) rate and the GDP-weighted euro area ten-year sovereign bond yield remained unchanged at 0.75% and 1.10%, respectively. In the United States the ten-year government bond yield increased by 3 basis points to 2.96%, causing its spread vis-à-vis the corresponding euro area yield to increase further and reach historically high levels.

Chart 4

Ten-year sovereign bond yields

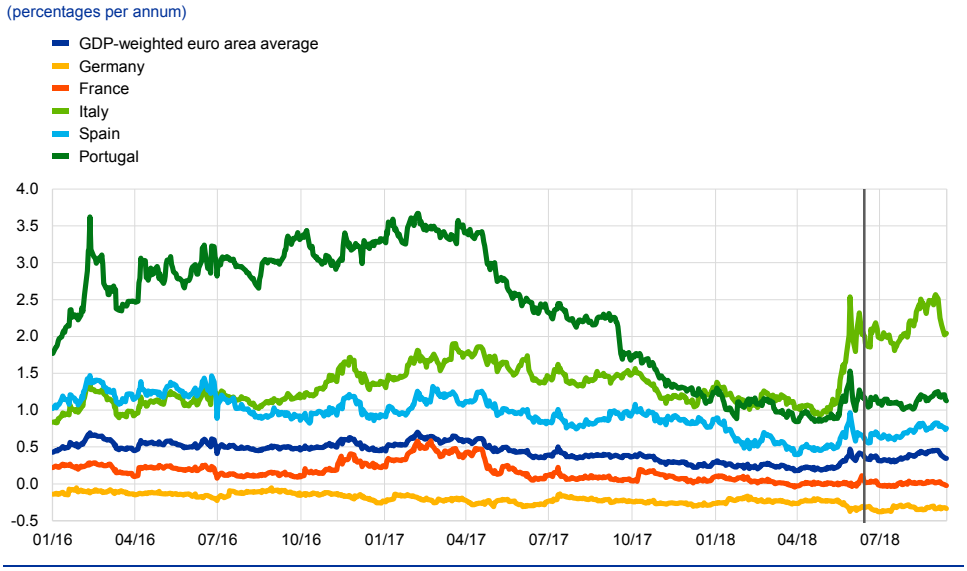


Sources: Thomson Reuters and ECB calculations.
Notes: Daily data. The vertical grey line denotes the start of the review period (i.e. 14 June 2018). The latest observation is for 12 September 2018.

Euro area sovereign bond spreads relative to the risk-free OIS rate have been volatile, but remain broadly unchanged compared with June. Sovereign bond market conditions remained volatile throughout the review period, with spreads of Italian sovereign bonds rising amid renewed tension in the market (see Chart 5). Government bond markets in other euro area countries have also been affected to different degrees. Overall, since 14 June the GDP-weighted average of ten-year sovereign bond yields has remained broadly unchanged, standing at 36 basis points on 12 September.

Chart 5

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

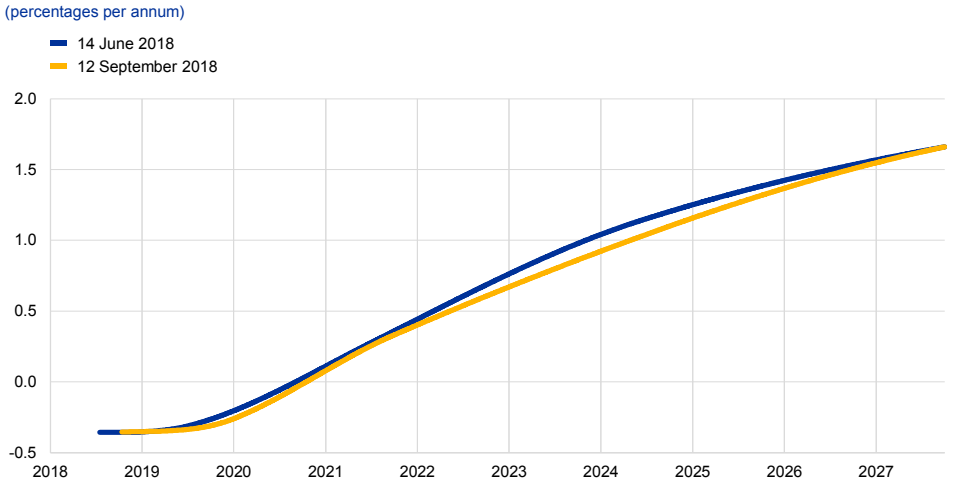


Sources: Thomson Reuters and ECB calculations.
Notes: The spread is calculated by subtracting the ten-year OIS rate from the sovereign yield. The vertical grey line denotes the start of the review period (14 June 2018). The latest observation is for 12 September 2018.

The euro overnight index (EONIA) forward curve remained broadly unchanged over the review period. Market participants revised their interest rate expectations for medium horizons, resulting in a marginal flattening of the forward curve (see Chart 6). The curve remains below zero for horizons prior to 2020, reflecting market expectations of a prolonged period of negative rates.

Chart 6

EONIA forward rates



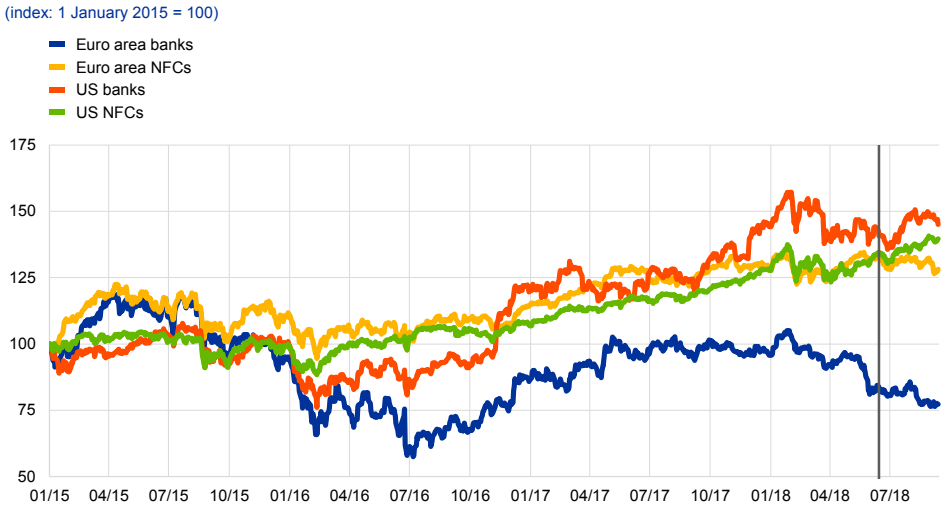
Sources: Thomson Reuters and ECB calculations.

Broad indices of euro area equity prices corrected amid increasing geopolitical uncertainty. Over the review period, equity prices of euro area financial and non-financial corporations (NFCs) decreased by around 4% and 5%, respectively (see Chart 7). Euro area equity market volatility increased over the review period amid the

ongoing fluctuations in sovereign bond markets, geopolitical uncertainty and increasing volatility in emerging markets. Overall, a robust corporate profit outlook continues to support euro area equity prices, reflecting a favourable euro area macroeconomic environment.

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 14 June 2018. The latest observation is for 12 September 2018.

The EONIA moved around -36 basis points over the review period. Excess liquidity increased by about €87 billion to around €1,909 billion. This increase is attributable to ongoing securities purchases under the Eurosystem's asset purchase programme and a reduction in autonomous factors.

Euro area corporate bond spreads increased over the review period. Since June, the spread on investment-grade NFC bonds relative to the risk-free rate has increased by 10 basis points to stand at 69 basis points (see Chart 8). Yields on financial sector debt have increased somewhat more, resulting in a spread widening of around 12 basis points. This increase reflects a repricing of risk rather than an increase in default probabilities. Overall, 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

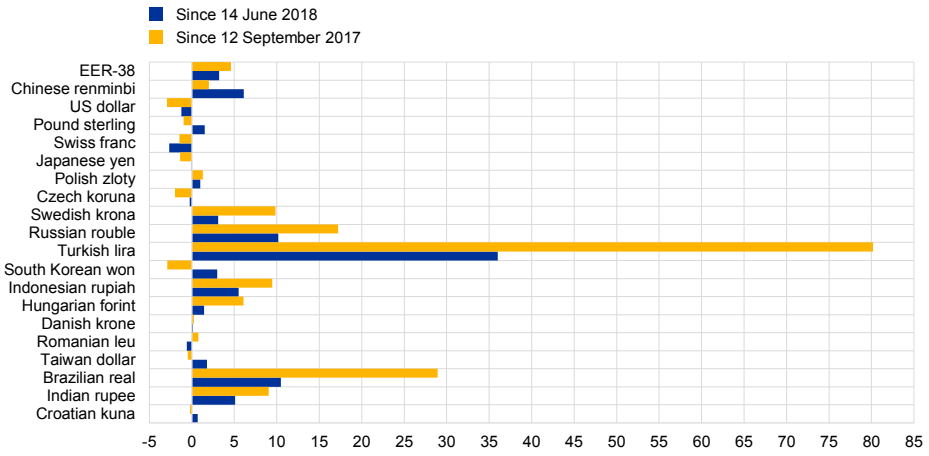
Sources: iBoxx indices and ECB calculations.
Notes: The vertical grey line denotes the start of the review period on 14 June 2018. The latest observation is for 12 September 2018.

In foreign exchange markets, the euro broadly strengthened 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, appreciated by 3.3%. The euro strengthened in effective terms despite depreciating vis-à-vis the US dollar and the Swiss franc, amid increased investor appetite for safe-haven currencies and the sharp depreciation of some emerging economy currencies. In bilateral terms, the euro weakened against the US dollar (by 1.2%), partly reflecting expectations about the future monetary policy stance of the Federal Reserve and the ECB, as well as against the Swiss franc (by 2.7%), but remained unchanged against the Japanese yen. By contrast, the euro broadly appreciated vis-à-vis the currencies of most emerging economies, including the Chinese renminbi (by 5.4%) and, in particular, the Turkish lira, the Brazilian real and the Russian rouble, which are among the currencies of emerging economies with the largest trade weights underlying the effective exchange rate of the euro. At the same time, the euro also appreciated against the British pound (by 1.5%) as well as against the currencies of most other non-euro area EU Member States.

Chart 9

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

(percentage changes)



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 12 September 2018.

3 Economic activity

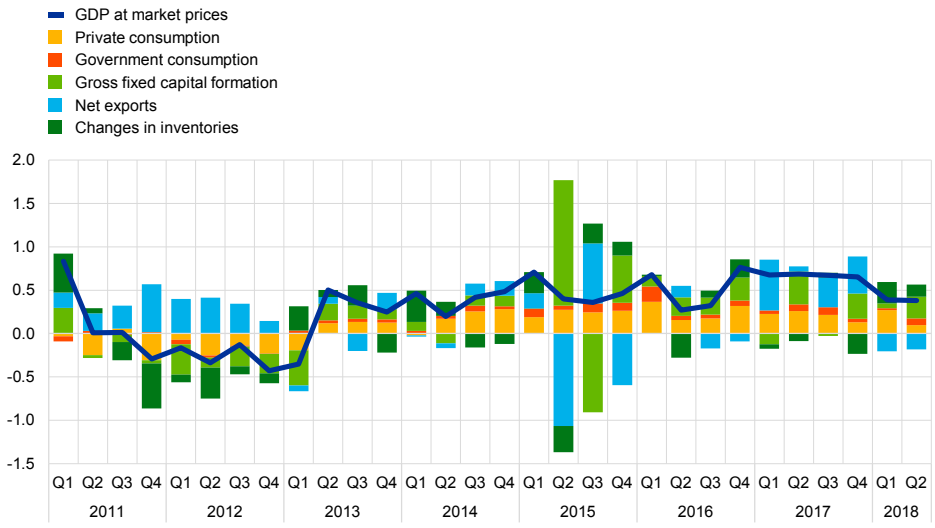
Despite some moderation following the strong growth performance in 2017, the latest economic indicators and survey results overall confirm ongoing broad-based growth in the euro area economy. Euro area real GDP growth is supported primarily by growth in private consumption and investment. The September 2018 ECB staff macroeconomic projections for the euro area foresee annual real GDP increasing by 2.0% in 2018, 1.8% in 2019 and 1.7% in 2020. Compared with the June 2018 Eurosystem staff macroeconomic projections, the outlook for real GDP growth has been revised down slightly for 2018 and 2019, mainly due to a somewhat weaker contribution from foreign demand.

Growth moderated in the first two quarters of 2018, but remained broad-based across euro area countries. Real GDP increased by 0.4%, quarter on quarter, in the first two quarters of this year, following average growth of 0.7% in the previous five quarters (see Chart 10). The slowdown in growth at the start of the year appears to have been related largely to weaker foreign demand while capacity constraints have gradually tightened. Domestic demand (notably fixed investment spending) continued to be the main engine of growth in the second quarter of 2018. As in the previous quarter, changes in inventories made a positive contribution to real GDP growth in the second quarter, whereas net trade made a negative contribution. On the production side, economic activity in the second quarter was mainly supported by robust growth in the services and construction sectors, while value added in industry (excluding construction) expanded somewhat less.

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 second quarter of 2018.

Employment growth remained robust in the second quarter of the year. Employment grew further, increasing by 0.4%, quarter on quarter, in the second quarter of 2018 (see Chart 11), and currently stands 2.4% above the pre-crisis peak

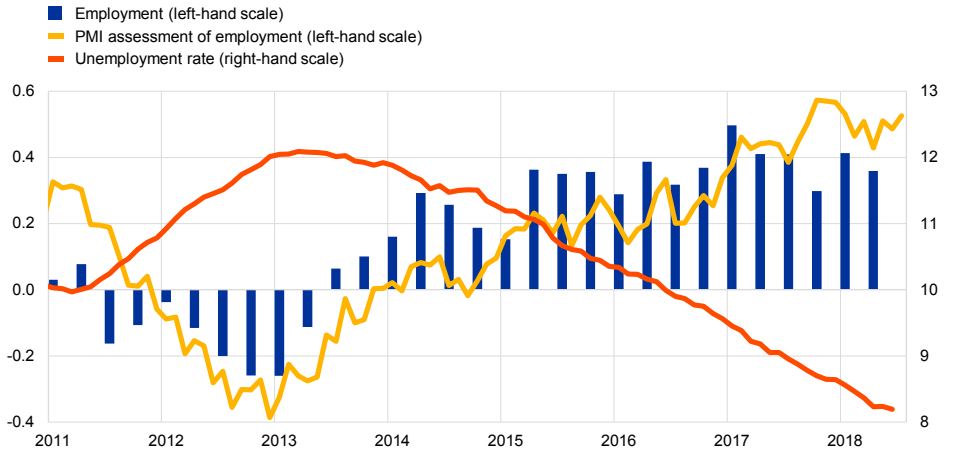
recorded in the first quarter of 2008. The increase in employment was broadly based across countries and sectors. In cumulative terms, the increase in the number of persons employed in the euro area since the trough in employment in the second quarter of 2013 amounts to 9.2 million. Hours worked per person employed increased by 0.3% in the second quarter, following a decline in the first quarter. So far, the average hours worked during the recovery have remained broadly stable, primarily reflecting the impact of several structural factors, such as 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 third quarter of 2018. The euro area unemployment rate stood at 8.2% in July – the lowest level seen since November 2008. Survey indicators have moderated somewhat from very high levels, but still point to continued employment growth in the third quarter of 2018. While indicators of labour shortages have moderated slightly in some sectors and countries, they remain at historically very high levels.

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 second quarter of 2018 for employment, August 2018 for the PMI and July 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 0.2%, quarter on quarter, in the second quarter of 2018, following somewhat stronger growth in the first quarter. The latest developments in retail trade and passenger car registrations are broadly in line with steady consumption growth in the near future. 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 households' balance sheets remains an important factor behind steady consumption growth, since households' creditworthiness is a key determinant of their access to credit. The recent increases in oil prices are unlikely to significantly dent the growth of real disposable income and private consumption (see Box 3).

The ongoing recovery in housing markets is expected to continue to support growth, albeit at a softening pace. Housing investment increased by 0.8% in the second 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 picked up again, almost reaching a seven-year high in June, when it increased by 0.1 percentage point compared with May and 0.3 percentage point in quarterly terms. The European Commission construction confidence indicators in the last few months point to positive, albeit softening, momentum in the third quarter of 2018. In contrast, the Purchasing Managers' Index (PMI) indicator for construction output dropped to 50.3 in July, the weakest pace of expansion in 21 months, but increased again to 51.0 in August. The housing component decreased at a stronger pace in the last two months. However, both the PMI indicators and confidence indicators remain clearly above their long-run averages.

Business investment is expected to continue to grow, supported by favourable earnings expectations, accommodative financing conditions and firms' need to expand their productive capacity. Business investment is expected to grow solidly, in line with elevated firm valuations. Earnings expectations for listed companies in the euro area continue to support investment, while favourable financing conditions are reflected in the expansion of loans to non-financial corporations. Investment is also rising in sectors facing capacity constraints. Indeed, manufacturers of machinery and equipment, for instance in the transport sector, are expanding their productive capacity to meet rising demand.

Euro area exports recovered slightly, expanding by 0.6% in the second quarter of 2018, after the decline in the first quarter. The recovery was driven by goods exports and, to a lesser extent, by services (0.7% and 0.3%, respectively, quarter on quarter), resulting primarily from a resumption of intra-euro area exports. Extra-euro area exports remained subdued, with those to Asia rebounding only slightly and those to North America declining, which offset the strong developments seen in previous quarters. Looking ahead, survey indicators for global and euro area new manufacturing orders tend to anticipate a further moderation in export growth in the third quarter.

Overall, the latest economic indicators and survey results confirm ongoing broad-based growth in the euro area economy. Industrial production (excluding construction) declined in July, albeit with mixed signals across sectors and the larger euro area countries. As regards survey information, the European Commission's Economic Sentiment Indicator (ESI) continued to decline in July and August, but remains well above its long-term average. The composite output PMI stabilised throughout the second quarter and remained broadly stable in July and August at levels suggesting continued solid growth.

The ongoing solid and broad-based economic growth is expected to continue. The ECB's monetary policy measures continue to underpin domestic demand. Private consumption is supported by ongoing employment gains, which, in turn, partly reflect past labour market reforms, and by rising wages. Business investment is fostered by favourable financing conditions, rising corporate profitability and solid demand.

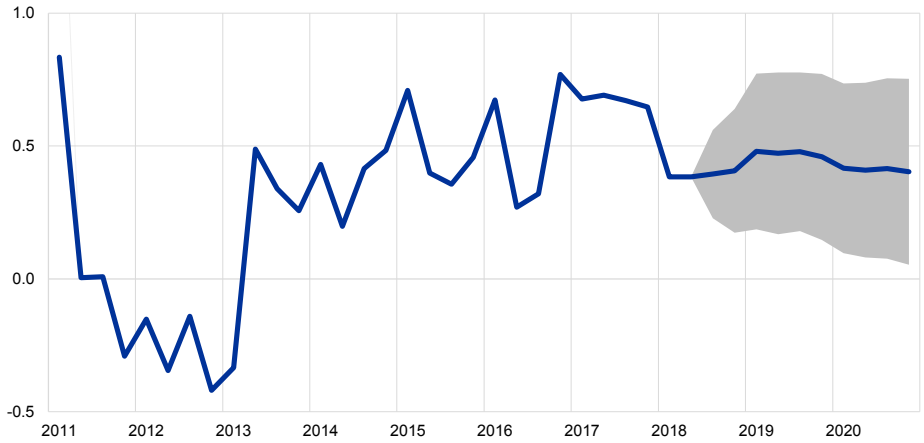
Housing investment remains robust. In addition, the expansion in global activity is expected to continue, supporting euro area exports.

The September 2018 ECB staff macroeconomic projections for the euro area foresee annual real GDP increasing by 2.0% in 2018, 1.8% in 2019 and 1.7% in 2020 (see Chart 12). Compared with the June 2018 Eurosystem staff macroeconomic projections, the outlook for real GDP growth has been revised down slightly for 2018 and 2019, mainly due to a somewhat weaker contribution from foreign demand. The risks surrounding the euro area growth outlook can still be assessed as broadly balanced. At the same time, risks relating to rising protectionism, vulnerabilities in emerging markets and financial volatility have gained more prominence recently.

Chart 12

Euro area real GDP (including projections)

(quarter-on-quarter percentage changes)



Sources: Eurostat and the article entitled "ECB staff macroeconomic projections for the euro area, September 2018", published on the ECB's website on 13 September 2018.
Notes: The ranges shown around the central projections are based on the differences between actual outcomes and previous projections carried out over a number of years. The width of the range is twice the average absolute value of these differences. The method used for calculating the ranges, involving a correction for exceptional events, is documented in "New procedure for constructing Eurosystem and ECB staff projection ranges", ECB, December 2009, available on the ECB's website.

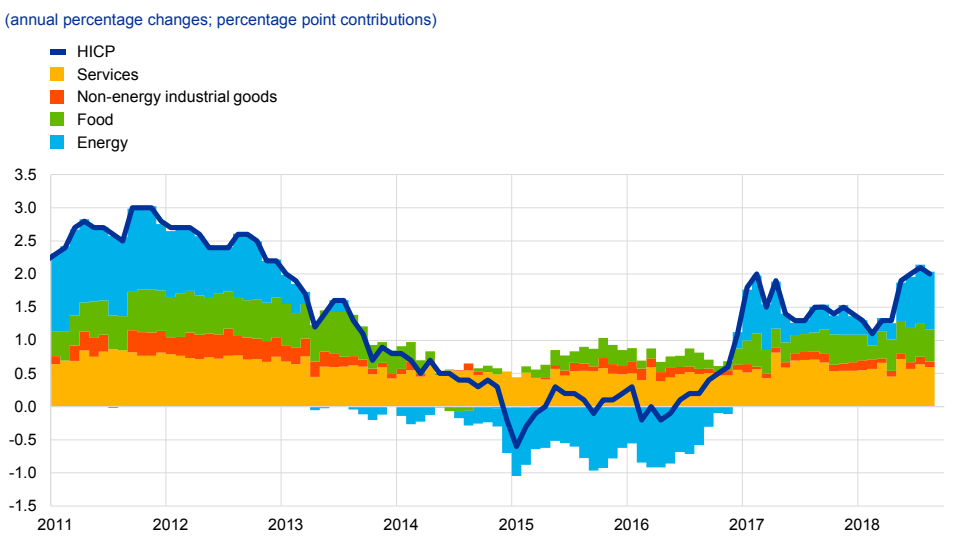
4 Prices and costs

According to Eurostat's flash estimate, euro area annual HICP inflation declined slightly to 2.0% in August 2018, from 2.1% in July. While measures of underlying inflation remain generally muted, they have been increasing from earlier lows. Domestic cost pressures are strengthening and broadening amid high levels of capacity utilisation and tightening labour markets, which is pushing up wage growth. 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 and rising wage growth. This assessment is also broadly reflected in the September 2018 ECB staff macroeconomic projections for the euro area, which foresee annual HICP inflation at 1.7% in 2018, 2019 and 2020 – unchanged from the June 2018 Eurosystem staff macroeconomic projections.

Headline inflation decreased slightly in August. According to Eurostat's flash estimate, euro area annual HICP inflation declined to 2.0% in August 2018, from 2.1% in July (see Chart 13). This reflected lower HICP inflation excluding energy and food (HICPX) but also lower energy inflation. Overall, however, with rates of change of around 9%, energy inflation continued to contribute substantially to headline inflation, driven by increases in oil prices over the last months as well as by base effects.

Chart 13

Contributions of components to euro area headline HICP inflation



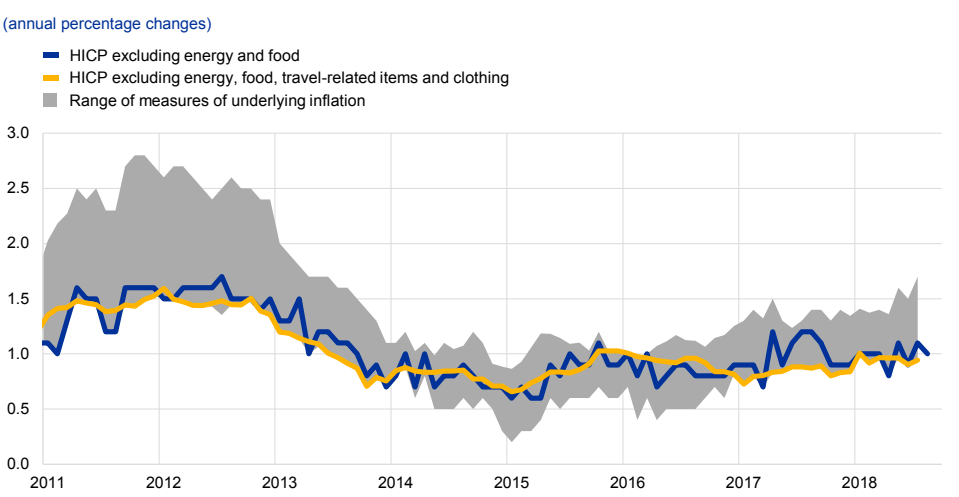
Sources: Eurostat and ECB calculations.
Note: The latest observations are for August 2018 (flash estimates).

Measures of underlying inflation remained generally muted, but on a gradually improving path. HICP inflation excluding energy and food was 1.0% in August, down from 1.1% in July. Both non-energy industrial goods and services inflation contributed to the decrease in HICPX inflation in August. Based on the available information, the slight decreases are at least partially due to transitory factors such as the calendar-related volatility of travel-related services items or that of clothing items due to changes in the timing of summer sales. Looking beyond the short-term movements

from one month to the next, the range of measures of underlying inflation display an upward-sloping path since the lows of 2016 (see Chart 14). Looking ahead, it is likely that past rises in energy prices will also contribute to an increase in measures of underlying inflation, given the pervasive role of energy in the production of other goods and services. These indirect effects on inflation take longer to manifest themselves than the direct effect on energy items in the HICP such as transport or heating fuels, as they have to percolate through supply chains.[2]

Chart 14

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 August 2018 (flash estimate) for HICP excluding energy and food and July 2018 for all the other measures.

Price pressures for non-energy industrial goods in the HICP continued to increase gradually. While transitory factors contributed to the decrease of non-energy industrial goods inflation at the consumer level from 0.5% in July to 0.3% in August, pressures along the pricing chain continued to increase. Producer price inflation for non-food consumer goods rose to 0.6% in July, from 0.5% in June. This is the highest outturn since late 2012 and marks a continuation of the gradual pick-up from the lows of around 0.0% in 2016. Import price inflation became increasingly less negative since May 2018 and reached 0.0% in July, thus reducing the downward pressure from this element of the overall non-energy industrial goods pricing chain. For intermediate goods, further up the supply chain, producer price inflation increased from 3.0% in June to 3.2% in July, while import price inflation increased from 3.0% to 3.4%.

Recent developments in wage growth signal a continued upward trend and support the notion of a gradual build-up in domestic cost pressures. Annual growth in compensation per employee increased to 2.3% in the second quarter of 2018, compared with 1.9% in the first quarter of 2018 and 1.8% in the fourth quarter of 2017. Compensation per employee growth now stands considerably higher than in the

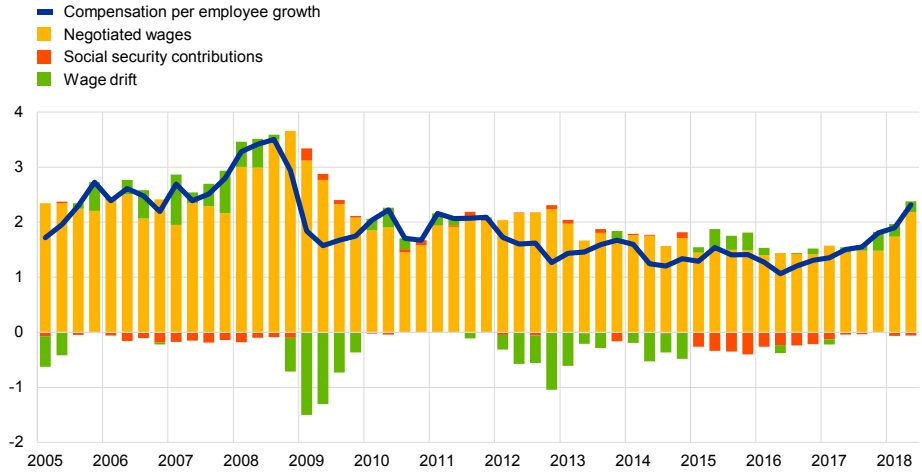
2 For more information, see the box entitled "Indirect effects of oil price developments on euro area inflation", *Monthly Bulletin*, ECB, December 2014.

first half of 2016 (see Chart 15). Its recent increase is driven mainly by the rise in the annual growth of negotiated wages to 2.2% in the second quarter of 2018, up from 1.7% in the first quarter of 2018 and 1.5% in the last two quarters of 2017. Looking ahead, wage agreements and the broadening of wage growth across sectors support the expectation of a further pick-up in wage growth. Overall, recent developments in wage growth are in line with improving labour market conditions, as factors that were weighing on wage growth, including past low inflation and the impact of labour market reforms implemented in some countries during the crisis, are beginning to fade.

Chart 15

Contributions of components of compensation per employee

(annual percentage changes; percentage point contributions)

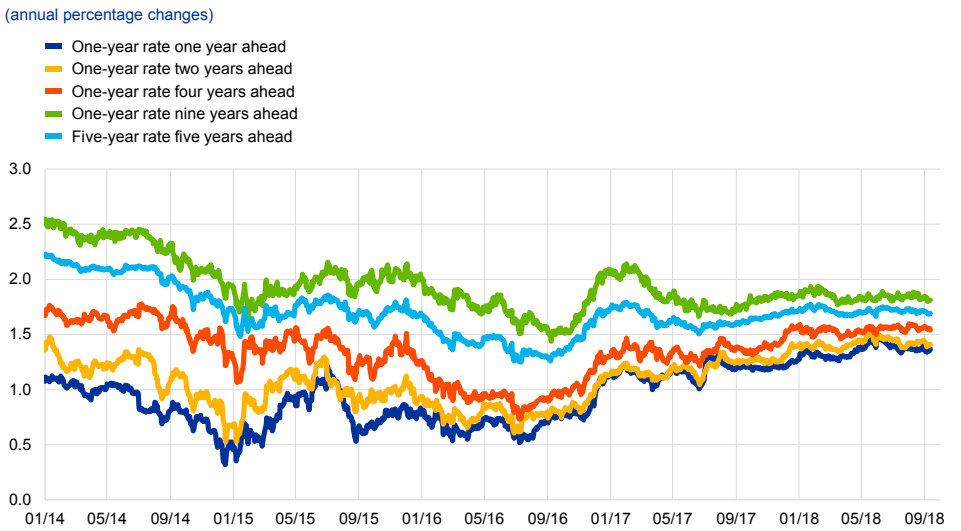


Sources: Eurostat and ECB calculations.
Note: The latest observations are for the second quarter of 2018.

Both market-based and survey-based measures of longer-term inflation expectations have remained stable. The five-year forward inflation-linked swap rate five years ahead stood at 1.69% on 12 September 2018 (see Chart 16). 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 inflation levels below, but close to, 2%. The risk-neutral probability of negative average inflation over the next five years implied by inflation options markets is negligible and hence suggests that markets currently consider the risk of deflation as very low. According to the ECB Survey of Professional Forecasters for the third quarter of 2018, longer-term inflation expectations have remained stable at 1.9%.

Chart 16

Market-based measures of inflation expectations



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

The September 2018 ECB staff macroeconomic projections expect stable HICP inflation and a gradual increase in underlying inflation over the projection horizon. On the basis of the information available at end-August, these projections expect HICP inflation to average 1.7% in each year of the projection horizon, unchanged from the June 2018 Eurosystem staff macroeconomic projections (see Chart 17). The stable path of the annual average inflation rates conceals a decline in the annual rate of the energy component as the impact of the past increases in oil prices fades, which is offset by gradually rising underlying inflation as supply constraints become increasingly binding. HICP inflation excluding energy and food is expected to rise from 1.1% in 2018 to 1.5% in 2019 and 1.8% in 2020.

Chart 17

Euro area HICP inflation (including projections)

(annual percentage changes)

Sources: Eurostat and the article entitled "September 2018 ECB staff macroeconomic projections for the euro area", published on the ECB's website on 13 September 2018.
Note: The latest observations are for the second quarter of 2018 (actual data) and the fourth quarter of 2020 (projections).

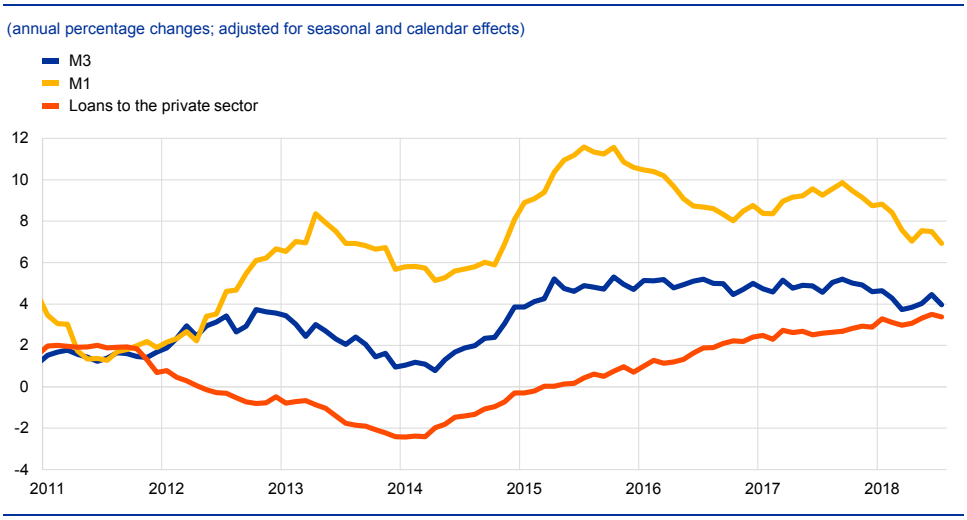
5 Money and credit

In July 2018 broad money growth moderated in the context of reduced monthly net asset purchases under the asset purchase programme (APP). Lending to the private sector continued to grow without showing any signs of slowing down. Linked to this, there was a considerable increase in the annual flow of total external financing to non-financial corporations (NFCs) in the second quarter of 2018.

Broad money growth decreased in July. The annual growth rate of M3 decreased to 4.0% in July 2018, compared with 4.5% in June (see Chart 18). This development in part reflects some volatility in recent monthly flows and base effects. Moreover, the reduction in net asset purchases (from €80 billion to €60 billion in April 2017, and then to €30 billion in January 2018) implied a smaller positive impact of the APP on M3 growth.[3] The annual growth rate of M1, which includes the most liquid components of M3, again made a significant contribution to broad money growth, but moderated to 6.9% in July (from 7.5% in June). Money growth continued to receive support from sustained economic growth and the low opportunity cost of holding the most liquid instruments in an environment of very low interest rates.

Chart 18

M3, M1 and loans to the private sector



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

Overnight deposits remained the main contributor to M3 growth. The annual growth rate of overnight deposits decreased in July to 7.5% (from 8.2% in June). Specifically, there was a sharp drop in the growth rate for overnight deposits held by non-monetary financial institutions, which tends to be rather volatile. The annual growth rate of overnight deposits held by NFCs declined as well, while that of overnight deposits held by households remained broadly unchanged. The annual growth rate of currency in circulation remained stable and did not indicate any 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

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

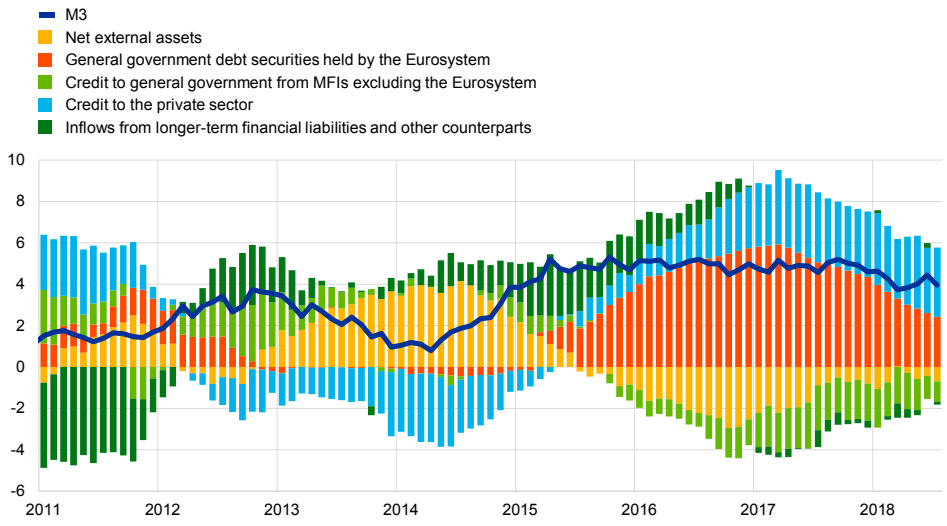
overnight deposits (i.e. M2 minus M1) continued to have a negative impact on M3, despite a stabilisation in the spread between the interest rates on short-term time deposits and overnight deposits since late 2017. Marketable instruments (i.e. M3 minus M2) – a small component of M3 – declined further given the currently low remuneration of these instruments.

Domestic sources of money creation remained the main driver of broad money growth (see Chart 19). 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 19), in the context of the aforementioned reduction in monthly net purchases under the APP. The declining contribution to M3 growth from the Eurosystem's asset purchases has been cushioned by a fairly steady and robust contribution from credit to the private sector since late 2017 (see the blue parts of the bars in Chart 19). This item includes both monetary financial institution (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 19). This development is related to funding substituted against the background of more attractive TLTRO (targeted longer-term refinancing operation) funds and Eurosystem covered bond purchases as part of the third covered bond purchase programme. Credit to general government from MFIs excluding the Eurosystem continued to dampen M3 growth (see the light green parts of the bars in Chart 19). Finally, MFIs' net external assets (see the yellow parts of the bars in Chart 19) continued to weigh on annual M3 growth.

Chart 19

M3 and its counterparts

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

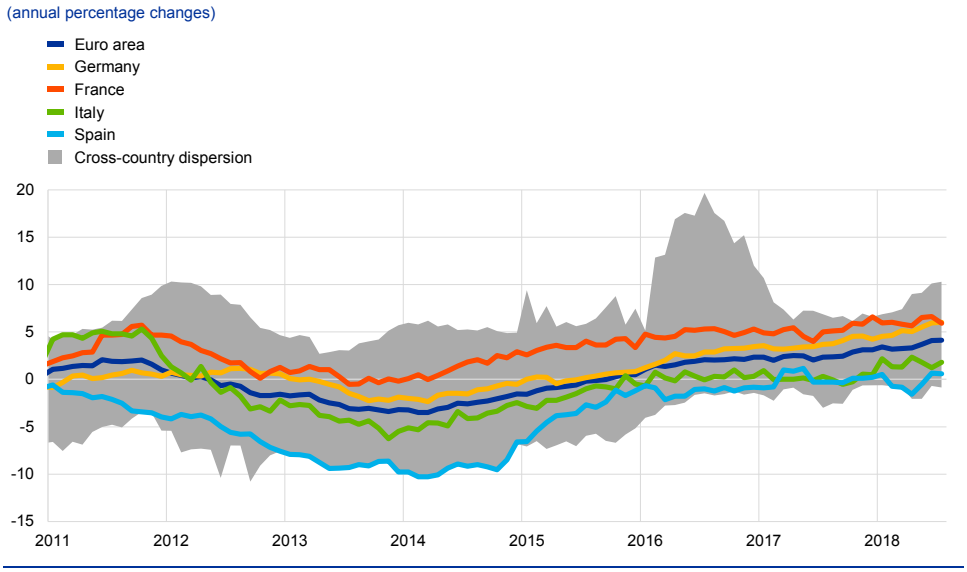


Source: ECB.
Notes: Credit to the private sector includes MFI loans to the private sector and MFI holdings of debt securities issued by the euro area private non-MFI sector. It thus includes the Eurosystem's holdings of debt securities in the context of the corporate sector purchase programme. The latest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

The recovery in the growth of loans to the private sector observed since the beginning of 2014 is proceeding. The annual growth rate of MFI loans to the private sector (adjusted for loan sales, securitisation and notional cash pooling) stood at 3.4% in July (compared with 3.5% in June; see Chart 18). Across sectors, the annual growth rate of loans to NFCs remained stable at 4.1% in July, having recovered significantly from the low level seen in the first quarter of 2014, while remaining heterogeneous across countries (see Chart 20). The increase in NFC lending is supported by very favourable financing conditions and robust growth in business investment. The annual growth rate of loans to households remained unchanged at 3.0% in July, in a context of pronounced cross-country heterogeneity (see Chart 21). Lending to households is supported by very favourable financing conditions, improvements in labour markets, mature housing markets and growth in both residential investment and private consumption. In addition, banks have made progress in consolidating their balance sheets, improving profitability and reducing non-performing loans, although the level of such loans has remained high in some countries.

Chart 20

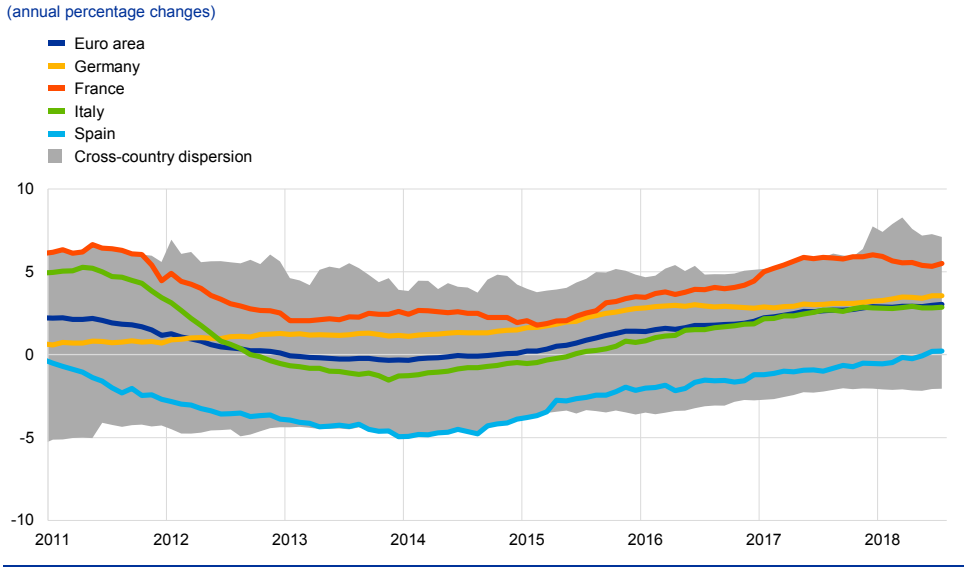
MFI loans to NFCs in selected euro area countries



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

Chart 21

MFI loans to households in selected euro area countries



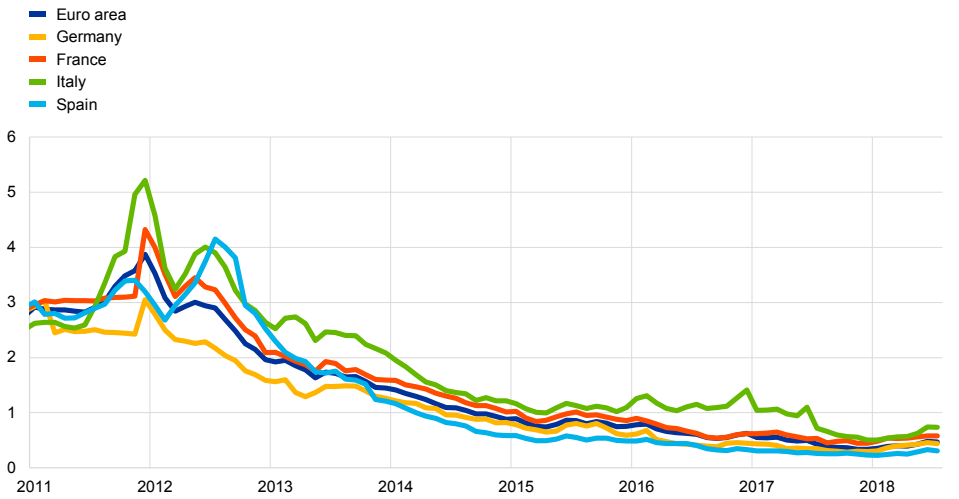
Source: ECB.
Notes: Adjusted for loan sales and securitisation. The cross-country dispersion is calculated on the basis of minimum and maximum values using a fixed sample of 12 euro area countries. The latest observation is for July 2018.

Banks' funding conditions remained favourable. In July euro area banks' composite cost of debt financing remained broadly unchanged (see Chart 22). This development reflected stabilising bank bond yields and unchanged costs of deposit funding. Since the beginning of 2018 average bank funding costs in the euro area have increased. This upward movement mainly reflects developments in bank bond yields, which have become more heterogeneous across countries, against the background of increased political uncertainty. Overall, the ECB's accommodative monetary policy stance, the net redemption of MFIs' longer-term financial liabilities, and the strengthening of bank balance sheets continued to contribute to favourable bank funding conditions.

Chart 22

Banks' composite cost of debt financing

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



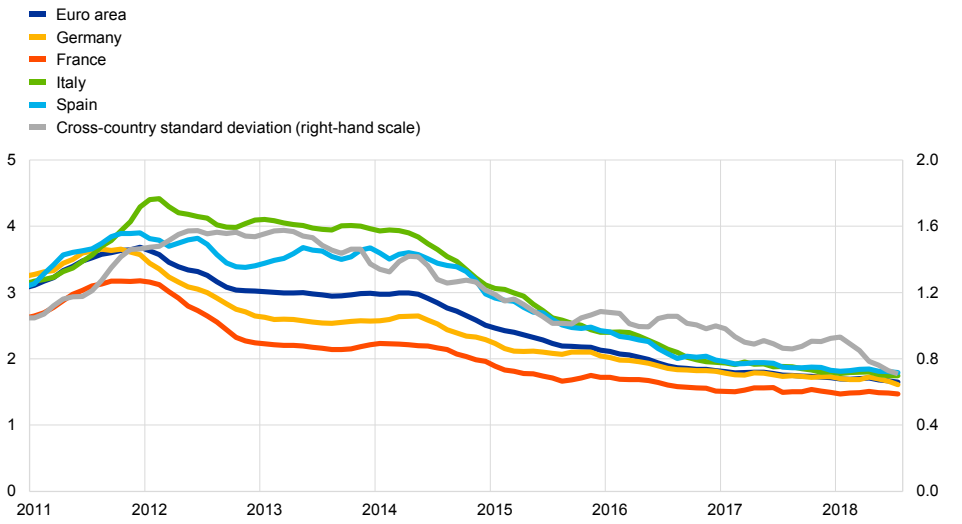
Sources: ECB, Markit iBoxx and ECB calculations.
Notes: The composite cost of deposits is calculated as an average of new business rates on overnight deposits, deposits with an agreed maturity and deposits redeemable at notice, weighted by their corresponding outstanding amounts. The latest observation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

Bank lending rates for NFCs and households remained close to their historical lows. The composite bank lending rate for NFCs (see Chart 23) decreased to 1.64% in July, close to the historical low of 1.62% seen in May 2018. Composite bank lending rates for loans to households for house purchase (see Chart 24) remained broadly unchanged at 1.81%, 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 above-mentioned decrease in banks' composite funding costs has supported the decline in composite lending rates. Between May 2014 and July 2018 composite lending rates on loans to NFCs and households fell by 129 basis points and 110 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. 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 23

Composite lending rates for NFCs

(percentages per annum; three-month moving averages)

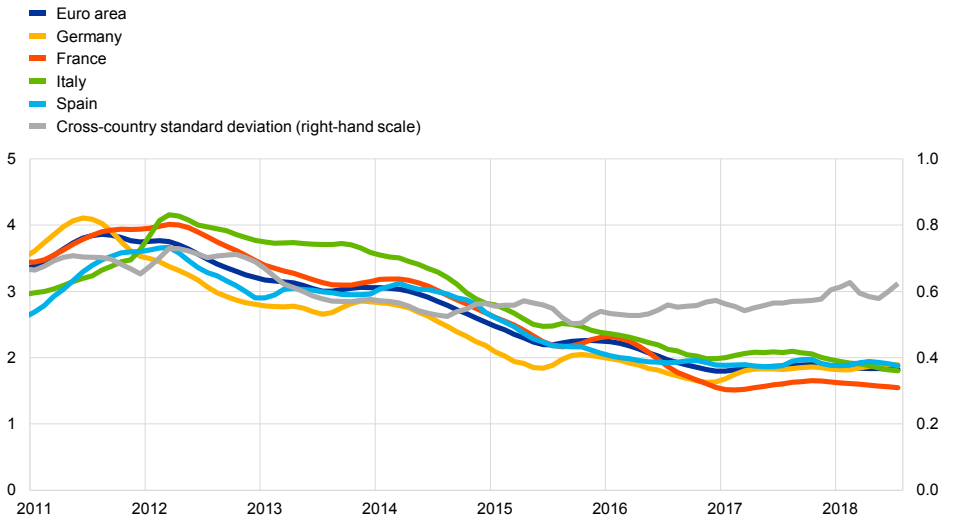


Source: ECB.
Notes: The indicator for the total cost of bank borrowing is calculated by aggregating short and long-term rates using a 24-month moving average of new business volumes. The cross-country standard deviation is calculated using a fixed sample of 12 euro area countries. The latest observation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

Chart 24

Composite lending rates for house purchase

(percentages per annum; three-month moving averages)



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

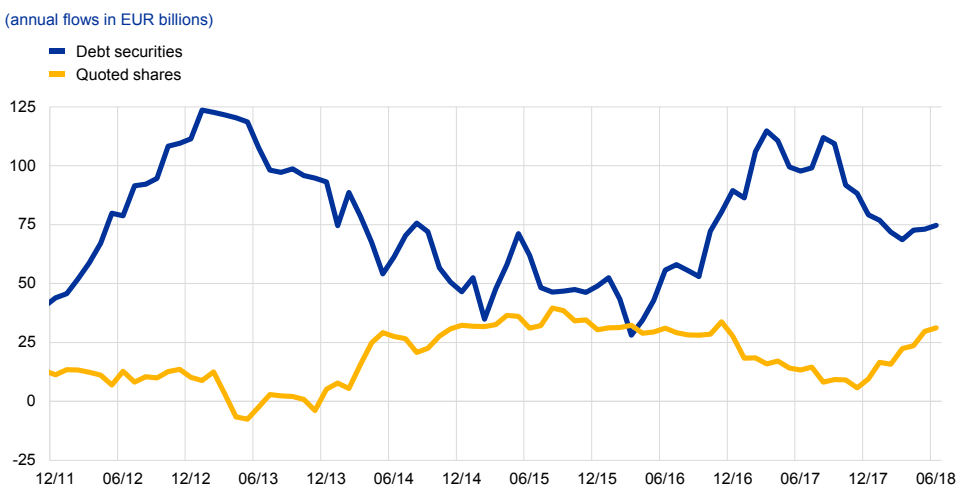
The annual flow of total external financing to euro area NFCs is estimated to have increased considerably in the second quarter of 2018. This primarily reflects a further strengthening of bank lending dynamics, supported inter alia by the continued easing of credit standards and a decline in the relative 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 (by improving borrowing conditions) and financing requirements related to the higher number of mergers and acquisitions. At the same time, NFCs' high retained earnings have reduced the need for external financing.

In the second quarter of 2018 the net issuance of debt securities by NFCs was more subdued than in the first quarter of 2018. In terms of monthly flows, in the second quarter of 2018, net issuance remained robust in April and May, but became negative in June as redemptions surpassed gross issuance. In terms of annual flows (see Chart 25), net issuance of debt securities has stabilised around the levels reached earlier this year, while net issuance of quoted shares continued to increase. Market data suggest that issuance activity in July and August was in line with historical seasonal patterns. Net issuance of listed shares by NFCs, by contrast, increased considerably in the second quarter of 2018.

Chart 25

Net issuance of debt securities and quoted shares by euro area NFCs



Source: ECB.
Notes: Monthly figures based on a 12-month rolling period. The latest observation is for June 2018.

NFCs' cost of financing has remained close to the favourable levels recorded at the beginning of the year. In July the overall nominal cost of external financing for NFCs, comprising bank lending, debt issuance in the market and equity finance, stood at 4.4%, which is broadly unchanged compared with June 2018. In August the cost of financing is estimated to have remained constant. The current cost of external financing surpasses the historical low of July 2016 by around 37 basis points only and, therefore, remains lower than the level seen in mid-2014 when market expectations of the introduction of the public sector purchase programme began to emerge.

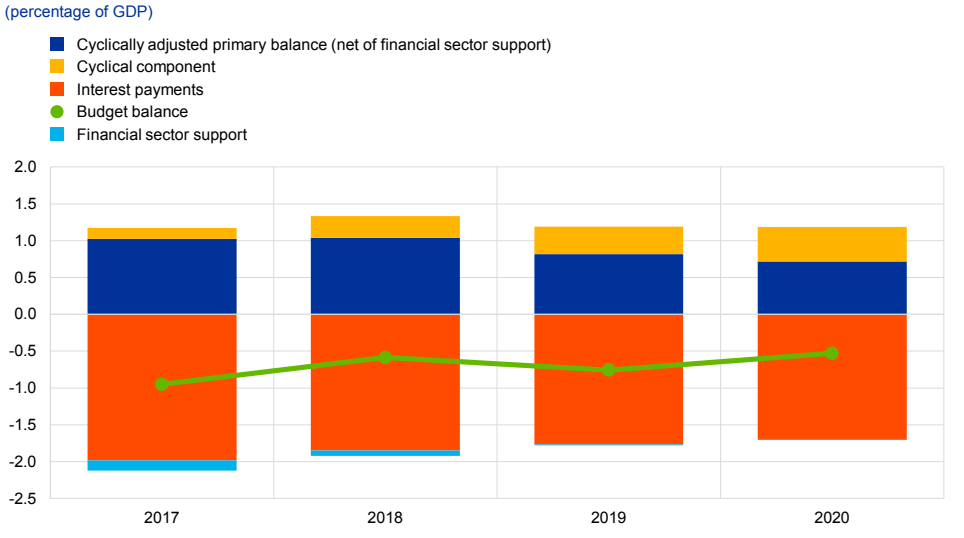
6 Fiscal developments

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 as high-cost debt continues to be replaced by new debt issued at lower interest rates. The aggregate fiscal stance for the euro area is expected to be broadly neutral in 2018 and then mildly expansionary in 2019 before returning to broadly neutral levels in 2020. 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 September 2018 ECB staff macroeconomic projections,[4] the general government deficit ratio for the euro area is expected to fall from 1.0% of GDP in 2017[5] to 0.5% of GDP in 2020. This improvement is expected to be temporarily interrupted in 2019, albeit due only to transitory factors. The overall improvement in the fiscal outlook is mainly driven by favourable cyclical developments and declining interest payments. This is partly offset by a lower cyclically adjusted primary balance in 2019 and 2020 (see Chart 26). The outlook for the euro area general government deficit is broadly unchanged compared with the June 2018 Eurosystem projections.

Chart 26

Budget balance and its components



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

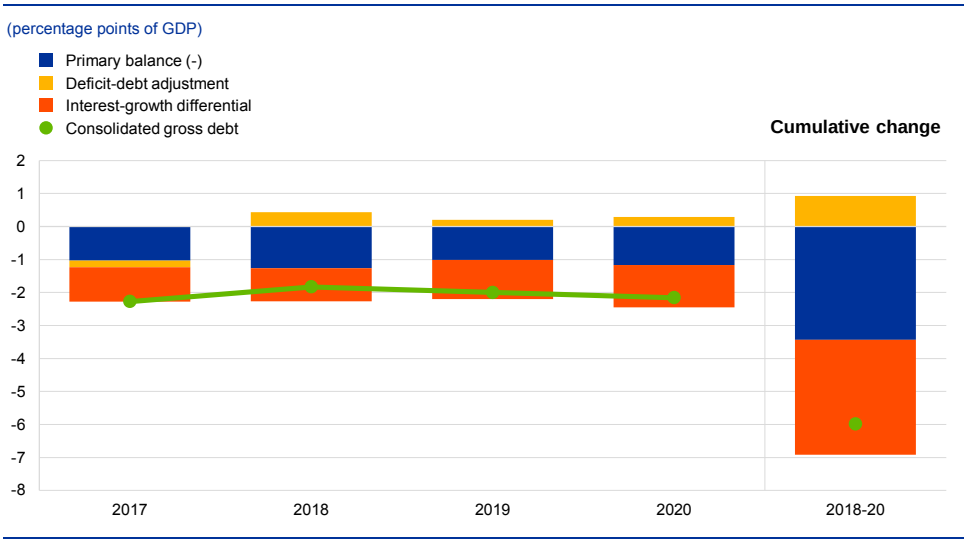
4 See the "September 2018 ECB staff macroeconomic projections for the euro area", ECB, 2018.

5 As the projections usually take the most recent data revisions into account, there might be discrepancies compared with the latest validated Eurostat data.

The euro area fiscal stance is projected to be broadly neutral in 2018 and then mildly expansionary in 2019 before returning to broadly neutral levels in 2020.[6] Cuts to direct taxes and social security contributions are expected to contribute to the slight loosening stance as a whole over the whole projection period, and particularly so in 2019.

The decline in the euro area aggregate public debt-to-GDP ratio is projected to continue. According to the September 2018 ECB staff macroeconomic projections, the aggregate general government debt-to-GDP ratio in the euro area is expected to decline from 86.6% of GDP in 2017[7] to 80.6% of GDP in 2020. The projected reduction in government debt is supported by both the interest rate-growth rate differential and primary surpluses (see Chart 27). Deficit-debt adjustments are, however, expected to offset some of these effects. Compared with the June 2018 projections, the decline in the aggregate euro area debt-to-GDP ratio is expected to be slightly more subdued. This is mainly due to a higher interest-growth differential which is only partly offset by higher primary surpluses. The debt outlook is projected to improve in most euro area countries, although debt levels in a few countries will continue to far exceed the reference value of 60% of GDP.

Chart 27
Drivers of change in public debt



Sources: ECB and September 2018 ECB 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. For high debt countries in particular, 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 to any future downturns or renewed

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

7 As the projections usually take the most recent data revisions into account, there might be discrepancies compared with the latest validated Eurostat data.

financial market instability. One factor that has significantly contributed to higher debt levels relates to financial sector support measures in several countries. Box 4 in this issue of the Economic Bulletin shows that, although the impact on debt from such support seems to have peaked, it continues to play a role. Moreover, contingent liabilities attributed to the financial sector remain elevated in several countries, which underlines the need for prudent fiscal policies going forward, as well as the importance of reinforcing the institutional framework in the euro area.

Boxes

1 Macroeconomic implications of increasing protectionism

Prepared by Allan Gloe Dizioli and Björn van Roye

The global trading landscape has changed rapidly in recent months. Announcements of tariffs by the US Administration and retaliation by its trading partners have raised concerns about a possible "trade war" and, potentially, a broader reversal of globalisation. On 1 March the US Administration announced tariffs of 25% on imports of steel and 10% on imports of aluminium from a wide range of countries. The first wave of tariffs relating to technology transfers on Chinese imports took effect on 6 July, followed by the announcement of retaliation in kind by the Chinese authorities. In response to the Chinese retaliation, the US Administration threatened to impose additional tariffs. In parallel, the EU and Canada implemented retaliatory measures against the US tariffs on steel and aluminium. Finally, the US Administration initiated a new investigation of imports of cars, trucks and auto parts (to determine their effects on national security) which could result in additional tariffs. Recently, however, there have also been some signs of a reduction in trade tensions resulting from a meeting between US and EU officials as well as the new NAFTA arrangements between the United States and Mexico.

This box looks at the possible impact on the global economy of a hypothetical escalation in trade tensions. In particular, channels through which protectionism might affect the economy are discussed and the potential global impact is quantified. This quantification relies on the ECB's global model[8] and the IMF's Global Integrated Monetary and Fiscal Model (GIMF)[9], which is a multi-country, multi-sector model. As with all models, the uncertainties involved mean that estimates from these scenarios should be treated with caution, but they can be used to provide a rough gauge of the channels at work.

In the near term, the direct effects of higher trade tariffs on economic activity in the country imposing the tariffs depend on two main channels: the expenditure switching channel – with a positive impact on GDP – and the aggregate income channel – with a negative impact. On the one hand, higher import tariffs could reduce the purchasing power of households by decreasing real disposable incomes, thereby discouraging domestic consumption and investment and reducing GDP. On the other hand, higher prices for imported goods could induce consumers and firms to switch to domestically produced goods, increasing domestic demand and reducing imports. The relative importance of the two channels, and consequently their combined impact on GDP, depends crucially on the degree of substitutability between domestically produced goods and imported goods. Greater substitutability would imply

8 See Dieppe, A., Georgiadis, G., Ricci, M., Van Robays, I. and van Roye, B., "ECB-Global: Introducing the ECB's global macroeconomic model for spillover analysis", *Economic Modelling*, Vol. 72, June 2018, pp. 78-98.

9 See Kumhof, M., Laxton, D., Muir, D. and Mursula, S., "The Global Integrated Monetary and Fiscal Model (GIMF) – Theoretical Structure", *IMF Working Papers*, No 10/34, February 2010.

that switching consumption to domestic goods is less costly for the consumer, rendering the expenditure switching channel stronger. However, if applied to intermediate goods, higher tariffs can also increase the cost of domestic production and lead to a delay in investments. At the same time, retaliatory trade measures can reduce exports and exacerbate the negative effect of trade disputes.

Indirect negative effects arising from a deterioration in business and consumer confidence could amplify the impact on economic activity. The direct trade effect does not take into account possible additional confidence effects and financial sector stress stemming from increased uncertainty about future policies. Uncertainty and confidence effects can have a sizeable negative impact on global investment and economic activity. Firms' investment decisions depend not only on current trade policy but also on prospective US and global trade policies. Similarly, uncertainty about future trade policies could affect the consumption behaviour of households. As concerns about the negative implications of rising protectionism increase, households may increase precautionary savings and postpone consumption. In addition, financial markets may respond to the negative real effects. A sharp change in trade policies could provide a catalyst for a reassessment of stock and bond prices, which would amplify the effects described above.

The protectionist measures taken so far will have only a marginal effect on global economic activity, as the targeted products represent only a small part of world trade. The very selective measures implemented so far, such as the tariffs on steel (25%), aluminium (10%) and USD 50 billion of US-China trade (25%) represent only a small fraction of world trade. In addition, the response so far in financial markets and in business and consumer confidence has been contained.

However, an escalation of trade tensions could have significant adverse global effects, as shown in a hypothetical scenario in which the United States raises tariffs on all imports by 10 percentage points and its trading partners retaliate with a 10 percentage points tariff increase on their US imports.[10] The direct channel described above is simulated in the GIMF model as an across-the-board imposition by the United States of 10% import tariffs on final and intermediate goods from all trading partners, who respond by imposing equivalent tariffs on US exports (but not vis-à-vis each other). It is very difficult to capture the indirect confidence effects of such import tariffs, so, for simplicity, it is assumed that bond premia rise by 50 basis points and stock markets decline by two standard deviations in all countries. For the United States this implies a 16% fall in the stock market. Although this implies elevated volatility in financial markets, it is still smaller than at the peak of the global financial crisis (in the fourth quarter of 2008), when the S&P 500 fell by 28% and bond premia rose by 230 basis points.

In our simulations, we also make some important modelling choices. First, we assume that the trade disputes last only two years.[11] Second, we assume that additional fiscal revenues generated by tariff increases are used to reduce budget

[10] The two scenarios are independent, so the 10% import tariff also applies to steel and aluminium.

[11] This modelling choice is motivated by technical considerations. By assuming temporary tariffs, we proxy myopic behaviour.

deficits, rather than to support demand. Third, monetary policy and exchange rates are assumed to react endogenously in all countries.[12] Fourth, we model confidence effects as changes in equity and bond risk premia.

Finally, in all scenarios the assumed form of retaliation is critical to spillovers. For example, if China and the United States escalate trade disputes between themselves and no other country is involved, trade diversion effects come into play. In such a scenario, higher tariffs make US goods more expensive in China and Chinese goods more expensive in the United States. As a result, goods of third countries, which are not part of the trade dispute, gain in competitiveness vis-à-vis US goods in China and Chinese goods in the United States. The extent to which a third economy benefits from this trade diversion depends on how easily a country can substitute between imported products from different countries. Lower substitutability would imply less trade diversion. This effect also depends on whether the exchange rate moves in line with the model predictions.

The trade channel

This scenario design suggests significant negative effects on the United States. The direct trade channel lowers US economic activity by 1.5% in the first year (see the blue bars in Chart A). Lower US imports and gains in market shares by US producers within their home market are outweighed by lower exports. Estimation results suggest that the United States' net export position would deteriorate substantially. In this model, US firms also invest less and hire fewer workers, which amplifies the negative effect on the US economy by reducing domestic demand. Gradual adjustment and substitution towards domestic production provides only limited compensation over time, and the direct trade effects of higher tariffs still imply that GDP will be 1% lower by the third year of the simulation.

By contrast, in China the trade effect on GDP is initially slightly positive, although the gains diminish over time. In the first year of the simulation, domestic consumption and investment fall in China. However, these negative effects are more than compensated by gains in China's net export position: the United States imports fewer Chinese goods, but that is cushioned by trade diversion to third countries, where Chinese exporters gain market share at the expense of US exporters. However, over time these benefits diminish: as US production adjusts in response to higher tariffs, demand for Chinese goods falls and Chinese GDP gains diminish.[13]

The confidence channel

The deterioration in confidence has significant adverse effects on global activity. Global financial market reactions have a significant and more wide-ranging

[12] For countries in which interest rates breach the zero lower bound, negative interest rates can be interpreted as shadow rates, reflecting non-conventional monetary policy measures.

[13] For example, it takes some time for producers to find US suppliers for previously imported intermediate goods, or for consumers to change their habits and start buying goods produced in the United States.

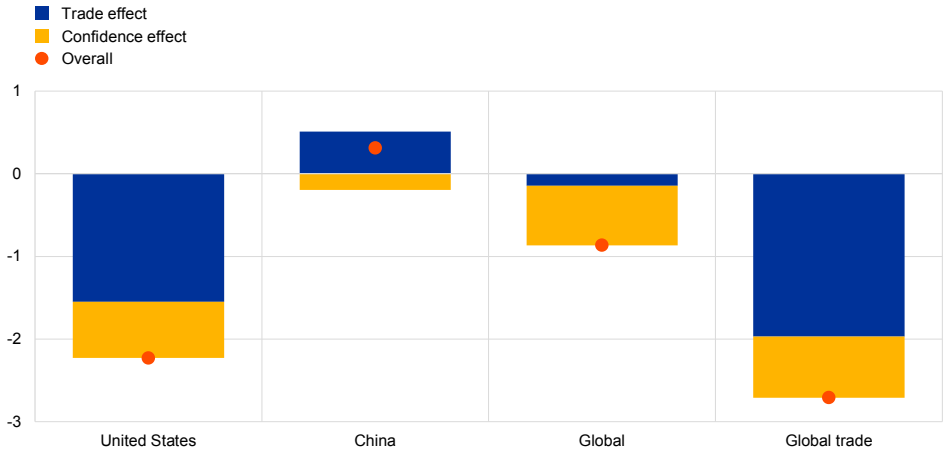
impact on output across countries, with global output around 0.75% lower in the first year (see the yellow bars in Chart A). The tightening of financial conditions dampens US GDP by about 0.7% and global trade by 0.75%. Heightened uncertainty and weakened confidence act as a drag on Chinese activity.[14]

Taken together, this implies that real economic activity in the United States could be more than 2% lower than the baseline in the first year alone, and global trade could fall by up to 3% relative to the baseline. In a nutshell, although one may argue about the relative contributions of each of the channels discussed above and about the overall effect on economic activity, qualitatively the results are unambiguous: an economy imposing a tariff which prompts retaliation by other countries is clearly worse off. Its living standards fall and jobs are lost.

Chart A

Estimated impact of an escalation in trade tensions – first year effects

(GDP response in 2018, deviation from baseline levels, percentages)



Source: ECB calculations.
Note: The results are a combination of the direct trade effects from the GIMF model and the confidence effects modelled using the ECB-Global Model.

[14] Fiscal policy in China is allowed to react according to the standard fiscal policy rule in the GIMF model.

2 Liquidity conditions and monetary policy operations in the period from 3 May to 31 July 2018

Prepared by Dimitrios Rakitzis and Mª Carmen Castillo Lozoya

This box describes the ECB's monetary policy operations during the third and fourth reserve maintenance periods of 2018, which ran from 3 May to 19 June 2018 and from 20 June to 31 July 2018 respectively. Throughout 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.

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 €1,427.5 billion, an increase of €64.5 billion compared with the previous review period (i.e. the first and second maintenance periods of 2018). This increase in liquidity needs was almost fully attributable to an increase in net autonomous factors, which on average rose by €64.4 billion to €1,303.3 billion during the review period, while minimum reserve requirements increased on average by less than €0.1 billion, amounting to €124.2 billion.

The growth in net autonomous factors, which implies absorption of liquidity, was a result of a decrease in liquidity-providing factors and an increase in liquidity-absorbing ones. The decline in liquidity-providing factors was in particular due to a decline in average net assets denominated in euro, which fell by €21.6 billion to €191.2 billion. This was mainly the result of higher Eurosystem liabilities to non-euro area residents in euro, which increased on average by €12.8 billion in the period under review, thus providing a negative contribution to average net assets denominated in euro,[15] and lower financial assets held by the Eurosystem for purposes other than monetary policy, which declined on average by €7.8 billion. On the liability side, the most relevant changes were driven by banknotes in circulation, which increased on average by €22.5 billion (reflecting to some extent seasonal patterns observed during the summer), and by government deposits, which increased on average by €11.9 billion to €239.4 billion.

[15] Eurosystem liabilities to non-euro area residents in euro mainly consist of euro-denominated deposits in accounts held by non-euro area central banks with 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 in the unsecured or secured market, ahead of balance sheet reporting dates. For example, on 29 March 2018 liabilities to non-euro area residents denominated in euro increased to €339.8 billion, compared to an average of €270.4 billion during the second maintenance period, while on 30 June 2018 they increased to €348 billion, compared to an average of €279.7 billion in the fourth maintenance period.

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, with higher volatility being observed around the June 2018 quarter-end and other month-end dates during the period under review.

Table A

Eurosystem liquidity conditions

Liabilities – liquidity needs (averages; EUR billions)

	3 May to 31 July 2018		31 January to 2 May 2018	Fourth maintenance period		Third maintenance period	
Autonomous liquidity factors	**2,123.9**	**(+43.8)**	**2,080.1**	**2,167.4**	**(+81.5)**	**2,085.9**	**(-16.9)**
Banknotes in circulation	1,176.5	(+22.5)	1,154.1	1,183.6	(+13.2)	1,170.4	(+11.3)
Government deposits	239.4	(+11.9)	227.5	263.8	(+45.7)	218.0	(-29.5)
Other autonomous factors	708.0	(+9.4)	698.6	720.0	(+22.5)	697.5	(+1.3)
Current accounts	**1,331.9**	**(+27.3)**	**1,304.6**	**1,306.7**	**(-47.3)**	**1,353.9**	**(+58.6)**
Monetary policy instruments	**780.1**	**(-20.4)**	**800.5**	**776.5**	**(-6.7)**	**783.2**	**(-9.2)**
Minimum reserve requirements[1]	124.2	(+0.0)	124.2	124.7	(+0.9)	123.8	(-0.7)
Deposit facility	655.9	(-20.4)	676.4	651.8	(-7.7)	659.5	(-8.5)
Liquidity-absorbing fine-tuning operations	0.0	(+0.0)	0.0	0.0	(+0.0)	0.0	(+0.0)

Assets – liquidity supply (averages; EUR billions)

	3 May to 31 July 2018		31 January to 2 May 2018	Fourth maintenance period		Third maintenance period	
Autonomous liquidity factors	**821.0**	**(-20.6)**	**841.7**	**821.5**	**(+0.8)**	**820.6**	**(-7.5)**
Net foreign assets	629.8	(+1.0)	628.9	635.1	(+9.9)	625.2	(-1.9)
Net assets denominated in euro	191.2	(-21.6)	212.8	186.3	(-9.1)	195.4	(-5.6)
Monetary policy instruments	**3,291.1**	**(+71.3)**	**3,219.8**	**3,305.2**	**(+26.1)**	**3,279.1**	**(+40.7)**
Open market operations	3,291.0	(+71.3)	3,219.7	3,305.1	(+26.1)	3,279.0	(+40.7)
Tender operations	753.2	(-8.6)	761.7	746.4	(-12.6)	759.1	(-2.4)
MROs	1.9	(+0.2)	1.7	2.1	(+0.3)	1.8	(-0.1)
Three-month LTROs	7.4	(-0.3)	7.7	7.2	(-0.2)	7.5	(-0.2)
TLTRO-I operations	11.1	(-1.9)	13.0	9.5	(-2.9)	12.4	(-0.3)
TLTRO-II operations	732.8	(-6.5)	739.3	727.6	(-9.7)	737.3	(-1.8)
Outright portfolios	2,537.8	(+79.8)	2,458.0	2,558.7	(+38.8)	2,519.9	(+43.1)
First covered bond purchase programme	4.7	(-1.1)	5.8	4.5	(-0.4)	4.9	(-0.7)
Second covered bond purchase programme	4.2	(-0.3)	4.5	4.1	(-0.2)	4.3	(-0.1)
Third covered bond purchase programme	254.6	(+5.7)	248.8	255.4	(+1.6)	253.8	(+3.3)
Securities Markets Programme	83.5	(-1.5)	85.0	82.3	(-2.1)	84.5	(-0.5)
Asset-backed securities purchase programme	27.5	(+1.7)	25.8	27.7	(+0.3)	27.4	(+1.1)
Public sector purchase programme	2,004.1	(+61.8)	1,942.3	2,021.6	(+32.4)	1,989.2	(+33.6)
Corporate sector purchase programme	159.2	(+13.5)	145.7	163.1	(+7.2)	155.9	(+6.5)
Marginal lending facility	0.1	(+0.0)	0.1	0.1	(-0.0)	0.1	(-0.0)

Other liquidity-based information (averages; EUR billions)

	3 May to 31 July 2018		31 January to 2 May 2018	Fourth maintenance period		Third maintenance period	
Aggregate liquidity needs	1,427.5	(+64.5)	1,363.0	1,471.0	(+81.6)	1,389.4	(-10.1)
Autonomous factors[2]	1,303.3	(+64.4)	1,238.8	1,346.3	(+80.6)	1,265.6	(-9.4)
Excess liquidity	1,863.5	(+6.8)	1,856.7	1,833.7	(-55.9)	1,889.6	(+50.8)

Interest rate developments (averages; percentages)

	3 May to 31 July 2018		31 January to 2 May 2018	Fourth maintenance period		Third 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	-0.363	(+0.001)	-0.364	-0.364	(-0.002)	-0.362	(+0.002)

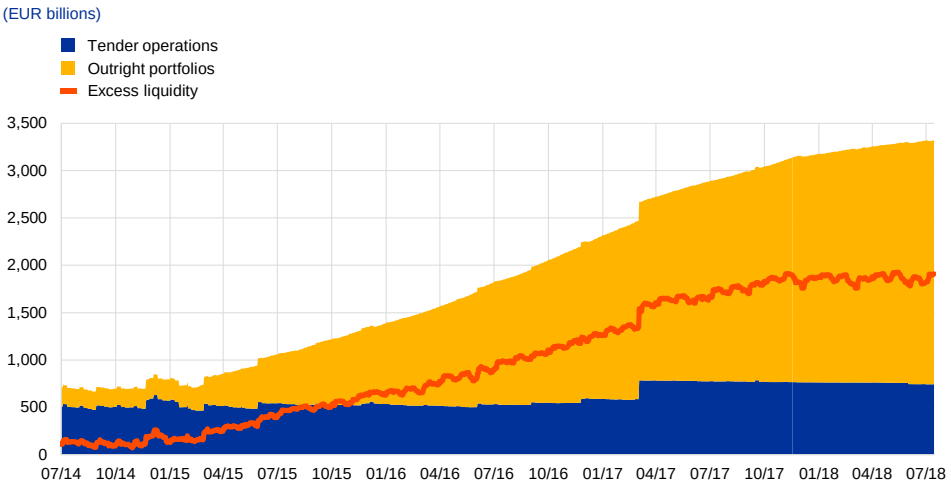
Source: ECB.
Notes: All figures in the table are rounded to the nearest €0.1 billion.
1) "Minimum reserve requirements" is a memo item that does not appear on the Eurosystem balance sheet and therefore should not be included in the calculation of total liabilities.
2) The overall value of autonomous factors also includes "items in course of settlement".

Liquidity provided through monetary policy instruments

The average amount of liquidity provided through open market operations – including both tender operations and APP purchases – increased by €71.3 billion to €3,291.1 billion (see Chart A). This increase was fully attributable to net APP purchases, 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 €8.6 billion to €753.2 billion. This decrease

was primarily due to a lower average outstanding amount of targeted longer-term refinancing operations (TLTROs), which decreased by €8.4 billion. The decline in outstanding TLTRO funds was related to the settlement of the voluntary repayments of various TLTRO-I operations and the first TLTRO-II operation in June 2018, which amounted to a total of €14.5 billion. The average liquidity provided through MROs increased by €0.2 billion to €1.9 billion and the average amount of liquidity provided through three-month longer-term refinancing operations (LTROs) fell by €0.3 billion to €7.4 billion.

Liquidity provided through the Eurosystem's monetary policy portfolios increased by €79.8 billion to €2,537.8 billion on average, on the back of ongoing net 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 €61.8 billion, €5.7 billion, €1.7 billion and €13.5 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 €2.9 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 review period, by €6.8 billion to €1,863.5 billion (see Chart A). The increase in liquidity through the APP purchases was almost entirely offset by an increase in net autonomous factors, mainly in the fourth maintenance period. In fact, while excess liquidity grew by €50.8 billion and net autonomous factors declined by €9.4 billion in the third maintenance period, these trends were reversed in the fourth maintenance period, with excess liquidity declining by €55.9 billion and net autonomous factors rising by €80.6 billion.

Regarding the allocation of excess liquidity holdings between current accounts and the deposit facility, average current account holdings grew by €27.3 billion to €1,331.9 billion, while average recourse to the deposit facility declined by a further €20.4 billion to €655.9 billion.

Interest rate developments

Overnight unsecured and secured money market rates remained close to the ECB 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 −0.363%, compared with an average of −0.364% in the previous review period. The EONIA fluctuated between a low of −0.371% around the weekend preceding Whit Monday (21 May 2018) and a high of −0.353% on the last day of June 2018. In the secured market, average overnight repo rates in the general

collateral (GC) pooling market[16] 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 −0.441% for the standard collateral basket, while the average overnight repo rate for the extended collateral basket was −0.394%.

The June 2018 quarter-end decline in repo rates for collateral from core euro-area countries was significantly milder than the decline at the end of the second quarter of 2017 and was widely perceived as a non-event. For example, at the end of June 2017 overnight GC repo rates for French collateral declined by 29 basis points to −0.75% and German collateral repo rates declined by 41 basis points to −0.90%. At the end of June 2018 the same repo rates declined by only 2 basis points and 5 basis points respectively, to −0.48% and −0.53%. This suggests that market participants have adopted more efficient practices for collateral management. Moreover, this development also suggests that the Eurosystem public sector purchase programme securities lending facility continued to support the smooth functioning of repo markets.

[16] The GC pooling market allows repurchase agreements to be traded on the Eurex platform against standardised baskets of collateral.

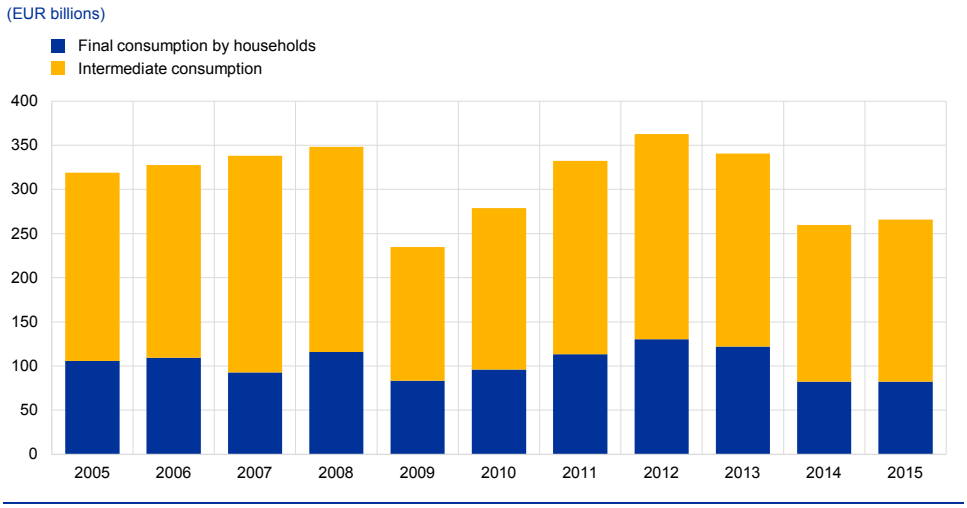
3 Oil prices, the terms of trade and private consumption

Prepared by Nikola Bokan, Maarten Dossche and Luca Rossi

Oil prices affect private consumption through direct and indirect channels. An increase in oil prices affects households' purchasing power directly through higher prices for oil-based energy products (e.g. petrol, heating oil). In the euro area about one-third of the economy's total oil use is in the form of final consumption, i.e. the use by consumers of such products (Chart A). The other two-thirds comes from oil being used in the production of non-energy goods. A rise in oil prices implies an increase in the production costs of these sectors. If these costs cannot be passed on to the final prices of these goods, there will be an indirect impact on households' purchasing power, since either wages or profits received from these sectors will be lower.[17] Moreover, for advanced economies that produce oil (e.g. Canada, Norway, the United Kingdom and the United States) the indirect effects through wages and profits from the oil-producing sector are even more important.

Chart A

Oil use in the euro area



Sources: Eurostat and ECB calculations.
Note: Data refer to coke and refined petroleum products and are at current and basic prices.

The terms of trade are highly correlated with oil price fluctuations. Changes in the relative prices of exports and imports, or the terms of trade, typically affect private consumption. The terms of trade can be interpreted as the amount of imported goods an economy can purchase per unit of exported goods. Chart B shows that the euro area's terms of trade are highly correlated with oil prices.[18] When oil prices rise, the terms of trade deteriorate and household purchasing power falls. The strong

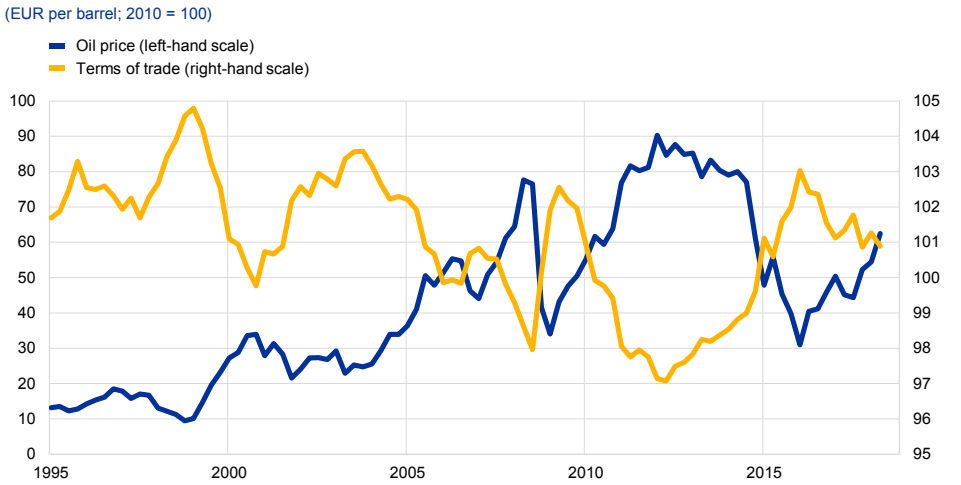
17 To the extent that producers of non-energy goods do adjust their prices to changes in oil prices, the purchasing power of households will be affected directly, as through the consumption of oil-based energy products.

18 In principle the terms of trade can also be affected by other factors (e.g. the nominal exchange rate, the prices of goods and services other than oil). Empirically, however, most of the variation in the euro area terms of trade is explained by oil prices.

correlation between oil prices and the terms of trade is widespread globally.[19] The correlation is typically negative for net oil importers and positive for net oil exporters. This relationship can change over time, as a result of either changes in the oil-intensity of consumption and the production of non-energy goods, or changes in oil production. The relationship between oil prices and consumption is thus inherently unstable.

Chart B

Oil prices and the terms of trade



Sources: Eurostat and ECB calculations.
Note: The terms of trade are calculated as the ratio of the export deflator over the import deflator.

The impact of oil price changes on real disposable income can be proxied by the differential between the deflators of GDP and consumption. Chart C presents a decomposition of household real disposable income, i.e. the income of households after tax and benefits, adjusted for price changes. It uses the differential between the deflators of GDP and consumption to capture the impact of oil-related changes in the terms of trade; for the euro area, the correlation between oil prices and this differential is negative. The measure is theoretically well-founded and captures both the direct and indirect channels through which oil prices affect household real disposable income.[20] Even if the channels through which oil prices affect the economy change, this approach still shows stability in the relationship between oil-induced changes in purchasing power and private consumption. This is relevant in the face of changes in the oil-intensity of consumption and innovations in the production of oil and non-energy goods; for example due to higher energy efficiency or new technologies to produce shale oil.[21]

[19] See Backus, D. and Crucini, M., "Oil prices and the terms of trade", *Journal of International Economics*, Vol. 50, No 1, pp. 185-213.

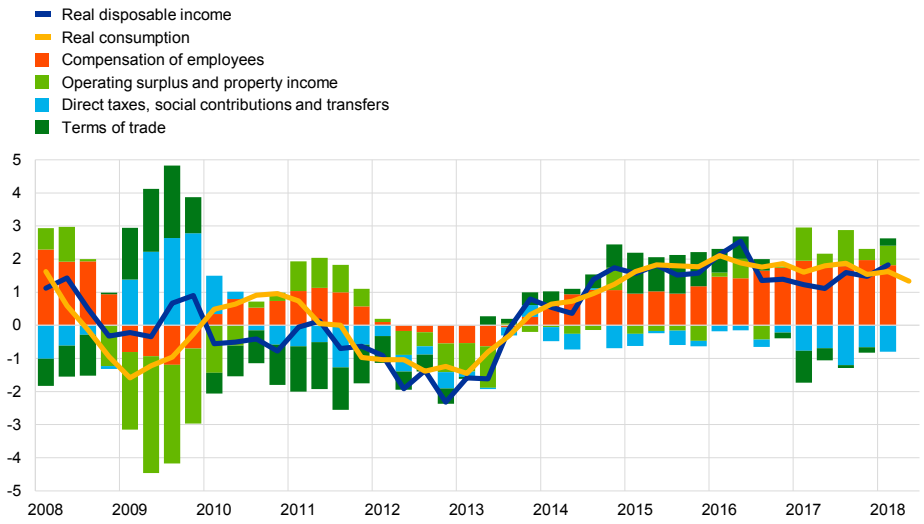
[20] See Blanchard, O. and Galí, J., "The Macroeconomic Effects of Oil Price Shocks: Why Are the 2000s so Different from the 1970s?", in Galí, J. and Gertler, M. (eds.), *International Dimensions of Monetary Policy*, University of Chicago Press, 2010, pp. 373-421.

[21] See Fosco, M. and Klitgaard, T., "Recycling Oil Revenue", *Liberty Street Economics*, Federal Reserve Bank of New York, 14 May 2018.

Chart C

Household disposable income and consumption

(annual percentage changes; percentage points)



Sources: Eurostat and ECB calculations.
Notes: All income components are deflated with the GDP deflator. The contribution from the terms of trade is proxied by the differential between the GDP and consumption deflators. Consumption and total disposable income are deflated with the consumption deflator.

Recent oil price increases are not expected to derail the expansion of private consumption. While the drop in oil prices in 2014 and 2015 certainly supported the expansion of private consumption, the overall growth of real disposable income since 2013 has been largely driven by labour income (Chart C). From mid-2017 to mid-2018 oil prices increased from about USD 50 to about USD 75 per barrel. If they remain at their present level, the increase is unlikely to significantly dent the growth of real disposable income and private consumption. Moreover, oil prices are still far below the levels observed from 2011 to 2014. As labour markets continue to improve, private consumption growth is expected to remain robust.[22]

[22] See the article entitled "Private consumption and its drivers in the current economic expansion", *Economic Bulletin*, Issue 5, ECB, 2018.

4 The fiscal impact of financial sector support measures: where do we stand a decade on from the financial crisis?

Prepared by João Domingues Semeano and Marien Ferdinandusse

This box takes a further look at the fiscal impact of the financial sector support measures taken in the ten years since the financial crisis struck. With the euro area economy entering its fifth year of expansion, this seems like a good moment to take stock of the fiscal costs of the crisis and the extent to which the recovery has helped to recoup them. This is done by focusing on the measures' impact on deficits and debt, and on the state guarantees granted to banks and other financial institutions.[23] Steps have been taken since the crisis to improve the supervision of the financial sector, the orderly resolution of failing financial institutions, the sustainability of public finances and the resilience of sovereigns, for example by establishing bodies like the Single Supervisory Mechanism, the Single Resolution Mechanism and the European Fiscal Board.

Financial sector support measures can affect deficit and debt differently. Unless they are financed from cash reserves, financial sector support measures will increase the general government gross debt. Whether they will also affect the budget balance depends on whether the operation presents a clear loss for the government.[24] If so, they are classified as a capital transfer for statistical purposes, meaning they have an impact on the budget balance and debt ratio. The acquisition of financial assets above market price and capital injections to cover bank losses are typical examples of this. However, if the government receives shares in a bank or debt securities that are considered to be of equal value to the capital injection it provides, the support measure is classified as a financial operation that only affects the general government gross debt. The statistical reclassification of entities from the financial sector to the general government sector, notably reflecting the nationalisation of banks, also increases government debt but not the budget deficit.

The fiscal impact of the financial sector support that euro area governments provided following the 2008 financial crisis was large and varied greatly across countries, and has only partially been reversed (see Chart A). During and after the global financial crisis that was marked by the collapse of Lehman Brothers on 15 September 2008, most euro area governments provided support to individual

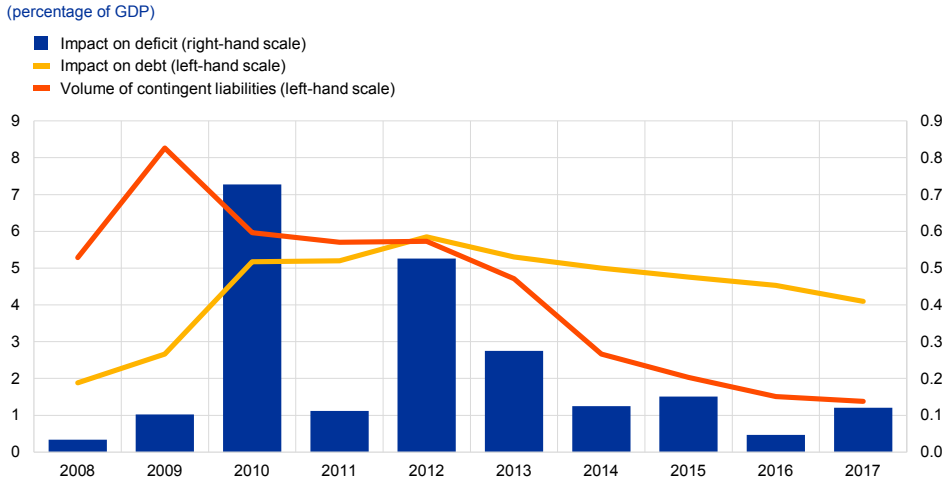
23 The impact of negative correlations between financial sector stability and government financing conditions that contributed to the sovereign debt crises in a number of euro area countries from 2010 onwards falls beyond the scope of this box. For a description of the channels and risks of the adverse financial-fiscal feedback loop, see "The impact of government support to the banking sector on euro area public finances", *Monthly Bulletin*, ECB, July 2009, and "Monetary and fiscal policy interaction in a monetary union", *Monthly Bulletin*, ECB, July 2012.

24 For more detailed information on the statistical classification of financial sector support measures, see "The fiscal impact of financial sector support during the crisis", *Economic Bulletin*, Issue 6, ECB, 2015, and Maurer, H. and Grussenmeyer, P., " Financial assistance measures in the euro area from 2008 to 2013: statistical framework and fiscal impact", *Statistics Paper Series*, No 7, ECB, 2015.

financial institutions in order to safeguard financial stability.[25] The size and timing of the support differed widely across countries (see Chart B and Chart C).[26]

Chart A

Impact of financial sector support measures on euro area deficit and debt, and volume of contingent liabilities



Source: Eurostat.
Note: Positive figures indicate an increase in the deficit. The impact on the deficit is net of income generated from financial support measures, such as dividends received on shares in financial institutions and fees received for public guarantee.

At the euro area level, financial sector support measures had a very large impact on the aggregate budget deficit in 2010 (0.7% of GDP), 2012 (0.5% of GDP) and 2013 (0.3% of GDP) (see Chart A). Only one country, Germany, recorded a tangible increase in its deficit in 2008 caused by financial sector support measures; this number increased to six in 2009 and peaked at nine in 2012 (see Chart B). While declining until recently, the impact on the euro area deficit has never been zero in the past ten years, and 2017 saw the effect increase again due to capital transfers in Italy, Portugal and Cyprus. Viewed across several years, the scale of the impact was in many cases equal to, or even far greater than, the effect of fiscal measures taken during regular budget cycles. Eight countries saw a cumulative impact between 2008 and 2017 that was higher than the euro area average, varying from an increase in the budget deficit of more than 4 percentage points of GDP in Spain, Austria and Latvia to more than 27 percentage points in Ireland (see Chart B).

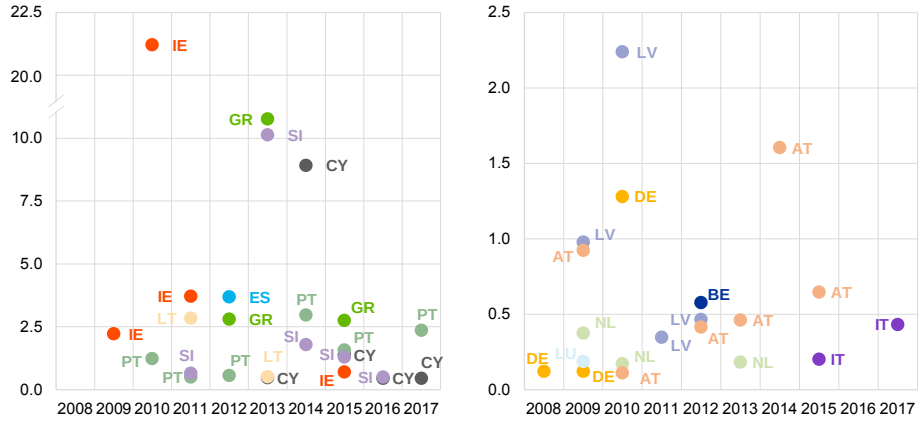
[25] For a description of the financial crisis and fiscal and financial measures taken, see Riet, A. (ed.), "Euro area fiscal policies and the crisis", *Occasional Paper Series*, No 109, ECB, 2010, and Stolz, S. and Wedow, M., "Extraordinary measures in extraordinary times: public measures in support of the financial sector in the EU and the United States", *Occasional Paper Series*, No 117, ECB, 2010.

[26] Only four countries – Estonia, Malta, Slovakia and Finland, together representing 3% of euro area GDP – did not need to take any measures that affected their deficit or debt.

Chart B

Net impact of financial sector support measures on the general government deficit

(percentage of GDP)

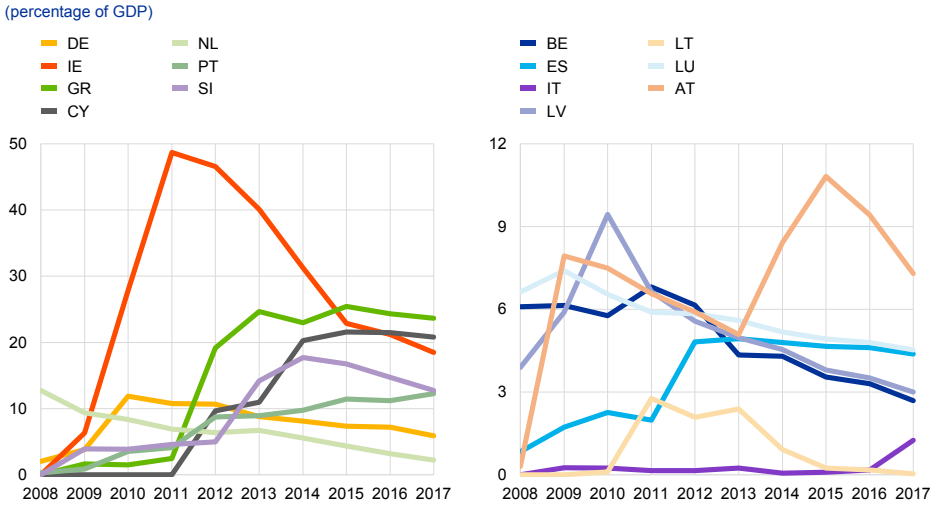


Source: Eurostat.
Notes: The chart does not include countries without support measures affecting the deficit (Estonia, Malta, Slovakia and Finland) or where such measures only have a marginal impact (0.1% of GDP in France in 2012). Positive figures indicate an increase in the deficit. The impact on the deficit is net of income generated from financial support measures, such as dividends received on shares in financial institutions and fees received for public guarantee. For readability, the countries are divided into two groups in order to present the same number of cases in each panel: the left panel excludes observations with a deficit impact below 0.4% of GDP and the right panel below 0.1% of GDP.

The impact on the euro area debt-to-GDP ratio, which peaked at almost 5.9% in 2012, stood at 4.1% in 2017. The maximum impact of the support measures on the debt-to-GDP ratio was 10% or more in eight euro area countries (see Chart C), including Germany, the Netherlands, Austria and Slovenia as well as the four euro area countries that required an EU/IMF adjustment programme (Ireland, Greece, Cyprus and Portugal). The time profile of the impact of the support measures on the general government gross debt varies considerably. The impact has started to partially and slowly reverse in most countries and in the euro area as a whole, thanks to the income generated from the support measures, such as dividends received on shares in financial institutions and fees received for public guarantees, and the sale of financial assets. Across countries, the recovery from the support provided has been particularly pronounced in Ireland, where the impact of financial sector support measures on the debt-to-GDP ratio had declined by 30 percentage points by 2017 compared with the peak, and also the Netherlands (ten percentage points since the peak), Latvia and Germany (six percentage points since the peak). However, support measures added to the debt in Italy, Cyprus and Portugal in 2017.

Chart C

Impact of financial sector support measures on general government gross debt



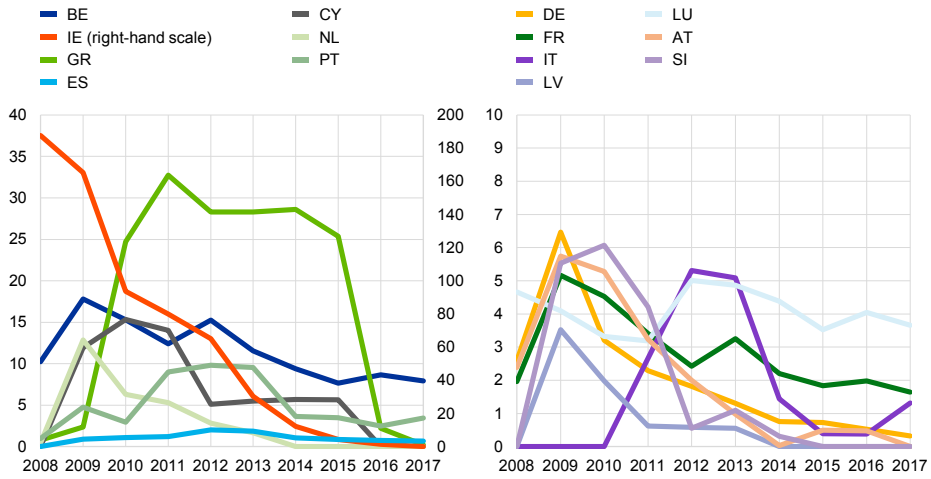
Source: Eurostat.
Note: The chart does not include countries without support measures affecting gross debt (Estonia, Malta, Slovakia and Finland) or where such measures only have a marginal impact (0.6% of GDP in 2008, and 0.1% of GDP in 2012 in France).

Euro area contingent liabilities fell from more than 8% of GDP in 2009 to 1.4% in 2017. In most cases, the explicit guarantees that many euro area governments provided to individual institutions at the height of the financial crisis – or, in a few instances, the financing of asset management vehicles – have been phased out (see Chart D). This mostly represents a positive development, as a return to financial stability meant there was no need to renew expiring guarantees. However, some guarantees have been called, and receiving entities have been classified in the general government sector, causing the reduction in the guarantee to be matched by an equivalent increase in government debt and/or deficit. For example, one-fifth of the guarantees provided as part of the partial privatisation of the Portuguese bank Novo Banco in October 2017, amounting to 2% of GDP, have been called, serving to increase the 2018 deficit by 0.4 percentage point of GDP. Six euro area countries, including France, Italy and Spain, still had outstanding contingent liabilities exceeding 1% of GDP in 2017. In addition, in July 2018 Cyprus provided guarantees for an asset protection scheme (APS) as part of the sale of the Cyprus Cooperative Bank (CCB). The APS covers potential unexpected losses on assets which have been acquired by the buyer of CCB, amounting to about 13% of GDP.[27]

[27] These guarantees come on top of state support in the form of bond and cash placements of about 18% of GDP, the statistical classification of which is yet to be determined.

Chart D

Volume of contingent liabilities



Source: Eurostat.
Notes: The chart does not include countries without contingent liabilities associated with financial sector support (Estonia, Malta, Slovakia and Lithuania) or where such liabilities are minimal (0.1% of GDP in Finland in 2008). Contingent liabilities refer to government guarantees to the banking sector. The outstanding government guarantees do not include guarantees covering retail deposits (except for Ireland from 30 September 2008 to 29 September 2010) or state guarantees for emergency liquidity assistance.

The widespread, large and long-lasting fiscal impact of financial sector support measures underlines the importance of further reinforcing the institutional framework in the euro area. As the Euro Summit on 29 June 2018 concluded, there is still progress to be made on the completion of the banking union and strengthening the European Stability Mechanism. Further work on this reform agenda, as well as continued efforts to safeguard fiscal sustainability, will be required to prevent future financial crises and mitigate the associated fiscal impact.

Articles

1 The global financial cycle: implications for the global economy and the euro area

Prepared by Maurizio Michael Habib and Fabrizio Venditti

As financial markets became progressively more integrated internationally over the past decades, economists wondered to what extent policymakers can isolate domestic financial conditions from external factors. This article reviews the terms of this debate and provides fresh evidence on the co-movement in capital flows and stock prices across a panel of 50 advanced and emerging economies. In particular, the article focuses on the relative importance of global risk and US monetary policy for the global financial cycle and touches upon the implications for the exchange rate regime. Global risk aversion emerges as a significant driver of capital flows and stock returns and its impact is amplified by capital account openness, but not necessarily by the exchange rate regime, which matters only for asset prices, not for capital flows. The quantitative relevance of US monetary policy and the US dollar exchange rate seems to be episodic. In particular, the correlation between US interest rates and capital flows throughout the crisis is positive, rather than negative as the theory would predict, indicating the need for further empirical analysis of the role of US monetary policy as the driver of the global financial cycle. The article also finds that financial market tensions have been typically synchronised between the euro area and the United States but that financial conditions in the two areas have often decoupled. Overall, this confirms that the effectiveness of the ECB's monetary policy has not been impaired by the global financial cycle.

1 Introduction

Over the past decades, financial markets have become progressively more integrated internationally. The size of world gross external liabilities, scaled by domestic GDP, increased from less than 50% at the beginning of the 1990s to around 200% at the onset of the global financial crisis in 2007.[28] The growth in cross-border liabilities came to a halt with the crisis, but the world today is much more financially integrated than 30 years ago.[29]

According to the literature, increasing financial integration has led to the emergence of a "global financial cycle", strongly influenced by US monetary policy. While financial integration is supposed to foster risk sharing internationally, economists wondered whether this integration, at the same time, could cause a faster and more uniform transmission of shocks across several economies, leading to the

[28] The ratio is computed as the sum for available countries of nominal US dollar liabilities over the sum of nominal US dollar GDP.

[29] See Lane, P. R. and Milesi-Ferretti, G., "International Financial Integration in the Aftermath of the Global Financial Crisis", IMF Working Paper No 17/115, May 2017.

emergence of a global financial cycle. Rey (2015) provides a potential operational definition of this concept: "global financial cycles are associated with surges and retrenchments in capital flows, booms and busts in asset prices and crises" and are "characterised by large common movements in asset prices, gross flows and leverage". Crucially, changes in monetary policy conditions in the centre economy, namely the United States, and in risk aversion globally, e.g. during the global financial crisis, would drive the global financial cycle, prompting swings in capital flows and asset prices across the globe.[30]

Such a global financial cycle, if present, would limit the potential benefits of financial integration. A stronger co-movement of asset prices internationally would drastically reduce the ability of economic agents to diversify away idiosyncratic shocks – i.e. country-specific ones, such as a domestic recession – through the acquisition of foreign assets.[31]

The existence of a global financial cycle would also have implications for policymakers and the choice of the exchange rate regime. According to the classical "trilemma" of monetary policy, if the capital account is open, it is impossible to run an independent monetary policy – i.e. to set the policy rate autonomously from that of the main centre economy, e.g. the United States – and, at the same time, have an exchange rate target. In this case (*trilemma hypothesis*), the choice of the exchange rate regime does matter, since a floating exchange rate would allow the running of an independent monetary policy. A global financial cycle would morph this trilemma into a dilemma for policymakers, leaving them with only two alternative options: (i) to keep the capital account closed, maintaining control of domestic financial conditions, or (ii) to open the capital account, relinquishing control of domestic financial conditions. Once the capital account is open, a global cycle would "set the tone" of domestic financial conditions – i.e. the interest rates that final borrowers, such as non-financial corporates and households, actually pay – irrespective of the ability of the domestic central bank to set the policy rate autonomously and the prevailing exchange rate regime. In this second case (*dilemma hypothesis*), the choice of the exchange rate regime is virtually irrelevant.

This article provides an overview of the debate on the global financial cycle and offers a fresh look at the evidence supporting the existence thereof. In particular, the article focuses on the relative importance of global risk and US monetary policy for the global financial cycle. Moreover, the article also touches upon the implications of this cycle for policymakers when adopting the exchange rate regime. The empirical analysis is based on a dataset consisting of capital flows – in particular gross capital

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30 Rey, H., "Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence", NBER Working Paper No 21162, May 2015, page 2. The evidence supporting the presence and economic significance of a global financial cycle has been challenged by a recent study by Cerutti, E., Claessens, S. and Rose, A. K., "How Important is the Global Financial Cycle? Evidence from Capital Flows", IMF Working Paper No 17/193, September 2017.

31 Risk sharing, that is the ability of agents to insure their consumption streams against idiosyncratic shocks, can occur via the "capital channel" (e.g. income on financial assets held abroad), the "fiscal channel" (e.g. cross-border transfers between governments) and the "credit channel" (borrowing abroad by individuals and governments, either in credit markets or through supranational insurance mechanisms such as the European Stability Mechanism). In the euro area, risk sharing takes place mainly via the capital channel. For a discussion, see the article entitled "Risk sharing in the euro area", *Economic Bulletin*, Issue 3, ECB, 2018.

inflows across four main categories: direct investment, portfolio equity, portfolio debt and other investment (such as bank loans, deposits and trade credits) from the International Monetary Fund's Balance of Payments Statistics database. The dataset also contains risky asset prices – stock market returns from Global Financial Data – for a sample of 50 economies since 1990 on a quarterly basis.[32] The article studies the relationship of these variables with those that have been consistently identified as the main drivers of the global financial cycle in the literature: global risk aversion and US monetary policy. Finally, the article elaborates on the implications for the global economy and the euro area.

2 Is there a global financial cycle? Revisiting the evidence

The existence of a global financial cycle rests on the validity of two distinct assumptions: one regarding the co-movement of capital flows and asset prices, and one regarding the drivers of such a co-movement. First, gross capital inflows, leverage of the banking sector, credit and risky asset prices share a common pattern over the past three decades.[33] Second, this pattern is inversely related to measures of global risk aversion and is driven by the US monetary policy. The purpose of this section is to revisit the evidence supporting the first leg of the analysis, the co-movement of capital flows and asset prices; the next section will elaborate on the evidence regarding the underlying drivers of this co-movement.

2.1 The co-movement of capital flows and asset prices

Capital flows and, in particular, asset prices, to a certain extent, share a common pattern across countries. Table 1 reports average bilateral correlations across the 50 economies in the full sample and separately for advanced and emerging economies. For each type of capital flow or asset price, all possible bilateral correlation coefficients between each pair of countries are calculated over the period 1990-2017 and then averaged, providing a simple and intuitive measure of co-movement. All correlations in Table 1 are positive, confirming the presence of a common pattern for capital flows and asset prices.

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32 The sample includes Argentina, Australia, Austria, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, India, Indonesia, Israel, Italy, Japan, Latvia, Lithuania, Malaysia, Mexico, New Zealand, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Korea (Republic of), Romania, Russian Federation, Saudi Arabia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom, United States and Uruguay. Similarly to other studies, the analysis focuses on "gross inflows" (i.e. net purchases and sales of domestic assets by foreign residents), which are crucial for assessing financial stability and global credit conditions. "Net flows", which broadly mirror current account balances, are more relevant for assessing the sustainability of net international investment positions. As regards risky asset prices, the focus is on stock returns, since it is difficult to obtain other measures, such as corporate bond prices or mortgage rates, for a large panel of countries including emerging economies since the 1990s.

33 See Passari, E. and Rey, H., "Financial Flows and the International Monetary System", *Economic Journal*, Vol. 125, No 584, May 2015, pp. 675-698. Moreover, Jordà, O., Schularick, M., Taylor, A. M. and Ward, F., show that the synchronisation of credit, house prices and equity prices across countries has increased above real sector integration across elected advanced economies over the past 150 years. However, in the past three decades, it is the co-movement of the equity markets that stands out as particularly elevated ("Global Financial Cycles and Risk Premiums", NBER Working Paper No 24677, June 2018).

Financial integration leads to a higher co-movement of asset prices with respect to capital flows. Table 1 shows that the degree of synchronicity of asset prices is much stronger than the one for capital flows. Under financial integration, international arbitrage exerts a strong pressure towards the equalisation of external finance premia[34], even with limited exposure to foreign assets and a substantial degree of home bias.[35]

The co-movement of capital flows across countries is positive, though not particularly elevated. Among the different types of capital flows, "other" flows (bank loans and trade credits) display the highest correlation (10%), in particular within the group of advanced economies (17%). To a large extent, this is the manifestation of what Bruno and Shin (2015) define as the transmission of the international "bank leverage cycle" (that is, the tendency of banking systems to expand balance sheets in good times) and of the retrenchment in capital flows – in particular risk-sensitive cross-border banking flows – following the global financial crisis.[36]

The co-movement of capital flows and risky asset prices increased in the run-up to the global financial crisis, peaking during the crisis.[37] Table 2 shows the average of quarterly bilateral correlations over different time periods. In particular, the period corresponding to the global financial crisis (2007-09) has been isolated, since it is known that high volatility tends to shift upwards any estimated correlation between two series, even if the underlying structural relationship between these two series has not changed.[38] With the exception of foreign direct investment, the synchronisation of capital flows and asset prices is higher in the run-up to the global financial crisis in the 2000s than in the 1990s. Unsurprisingly, the measured degree of synchronisation peaks during the global financial crisis between 2007 and 2009 when cross-border capital flows and stock market prices collapsed.

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34 This is the difference between the cost to a borrower of raising funds externally and the opportunity cost of internal funds.

35 Dedola, L. and Lombardo, G., "Financial frictions, financial integration and the international propagation of shocks", *Economic Policy*, Vol. 27, Issue 70, April 2012, pp. 319-359.

36 See Bruno, V. and Shin, H. S., "Cross-Border Banking and Global Liquidity", *Review of Economic Studies*, Vol. 82, No 2, 2015, pp. 535-564. For an analysis of the heterogeneous impact of the global financial crisis on cross-border capital flows, see Milesi-Ferretti, G.-M. and Tille, C., "The great retrenchment: international capital flows during the global financial crisis", *Economic Policy*, Vol. 26, Issue 66, April 2011, pp. 289-346.

37 Due to limited data availability, we do not look at the prices of risky bonds but only at equity prices.

38 For a discussion, see Forbes, K., "Global economic tsunamis: Coincidence, common shocks or contagion?", speech given at Imperial College, London, 22 September 2016, available on the Bank of England's website. See also Forbes, K. and Rigobon, R., "No Contagion, Only Interdependence: Measuring Stock Market Co-movements", *Journal of Finance*, Vol. 57(5), October 2002, pp. 2223-2261.

Table 1

Correlation of capital flows and asset prices since the 1990s

Averages (unweighted) of bilateral correlations of country capital flows and asset prices: 1990-2017

(percentages, quarterly data)

	Capital flows				Asset prices
	Foreign direct investment	Portfolio equity	Portfolio debt	Other investment	Stock returns
Whole sample	9.5	6.1	5.9	10.2	40.3
Advanced economies	8.0	5.7	10.4	17.7	54.5
Emerging economies	11.1	6.5	7.0	10.1	35.5

Sources: IMF Balance of Payments Statistics, Global Financial Data and ECB calculations.

Table 2

Correlation of capital flows and asset prices for different sub-samples

Averages of bilateral correlations of country capital flows and asset prices: sub-samples

(percentages, quarterly data)

	Capital flows				Asset prices
	Foreign direct investment	Portfolio equity	Portfolio debt	Other investment	Stock returns
Whole sample					
1990-1999	12.3	5.6	4.8	3.1	26.6
2000-2006	6.7	6.0	6.4	7.2	38.0
2007-2009	18.4	12.5	14.8	23.4	78.2
2010-2017	0.3	5.7	5.3	5.2	34.5
Advanced economies					
1990-1999	15.8	6.7	5.1	9.9	43.8
2000-2006	5.7	5.5	9.4	13.6	57.6
2007-2009	14.7	7.0	16.0	28.9	83.1
2010-2017	0.9	6.5	6.0	12.7	48.3
Emerging economies					
1990-1999	9.6	7.3	7.1	6.5	22.9
2000-2006	8.5	6.1	4.9	9.9	27.3
2007-2009	20.6	15.9	16.4	20.9	72.8
2010-2017	0.5	6.7	4.9	2.6	27.5

Sources: IMF Balance of Payments Statistics, Global Financial Data and ECB calculations.

The most recent period is characterised by a decline in the synchronisation of capital flows and asset prices. Following the global financial crisis, between 2010 and 2017, the synchronisation of capital flows and stock prices abated, generally returning to a level slightly lower than in the 2000s, but higher than in the 1990s (Table 2, first panel).[39] The picture is not substantially different when distinguishing advanced economies from emerging economies. Notably, the decline in the co-movement of capital flows after the global financial crisis appears to be more

[39] Direct investment appears to be an exception and follows a cycle that is different from other asset classes.

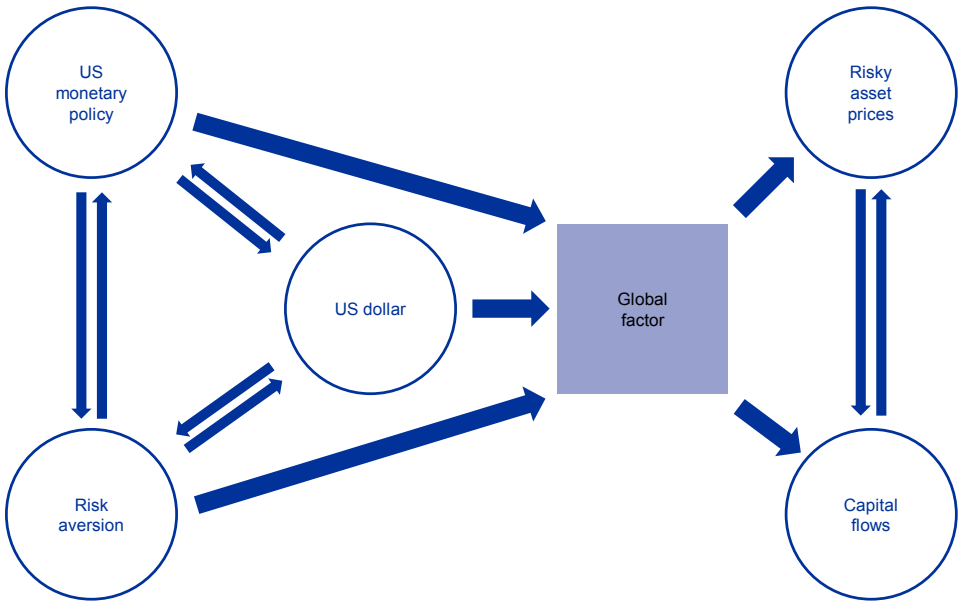
marked among emerging economies than in advanced ones (Table 2, second and third panels).

Overall, there is strong evidence of a common cycle in risky asset prices and some support for the presence of a common pattern in capital flows across the globe. The boom and bust cycle in the run-up to the global financial crisis tends to magnify the evidence in favour of the presence of a global financial cycle. Importantly, in the run-up to the global financial crisis, a global cycle is particularly evident for banking flows among advanced economies.

3 The global financial cycle: drivers and channels of transmission

The economic literature has identified two main potential drivers of the global financial cycle: US monetary policy and global risk aversion. Figure 1 depicts in a stylised way the complexity of the mechanism and the channels of transmission of the global financial cycle. For instance, the stance of US monetary policy may affect risk attitude globally, but the causality may run in the opposite direction. An "unexpected" tightening that surprises the markets is normally associated with an increase in risk aversion, a decline in the price of risky assets and a widening of external finance premia beyond the US borders. At the same time, risk aversion shocks – e.g. those generated by the global financial crisis or by major geopolitical events such as war or terrorist attacks – may induce changes in the stance of monetary policy to counteract the negative effects of these shocks on the economy.

Figure 1
The transmission channels of the global financial cycle



Source: ECB.

A global factor shaping the co-movement of risky asset prices is closely related to global risk aversion, which has been identified as one of the main drivers of the global financial cycle. As shown in the previous section and extensively documented by a growing body of literature, returns on risky assets share a common component that drives a non-negligible fraction of their fluctuations. According to Miranda-Agrippino and Rey (2018), for instance, this global factor would explain up to a quarter of the variance of a large cross-section of risky returns.[40] This factor would reflect the risk appetite of global investors and therefore would be negatively related to the degree of risk aversion of the market.

A second central driver of the global financial cycle identified throughout the literature is the role of US monetary policy, which drives asset prices, both domestically and globally. Spillovers originating from US monetary policy have received special scrutiny in the literature, owing to the central role played by the US dollar in global financial markets. Indeed, around 60% of the international debt securities issued in the world and about as much of global cross-border loans are denominated in US dollars.[41] In this context, particular attention has been given to the role of *global banks*, large intermediaries with a strong presence in cross-border lending, which amplify the international dimensions of US monetary policy. Indeed, monetary policy, by changing the value of the assets in global banks' balance sheets, alters both their leverage position and their willingness to take risk. For instance, a monetary policy expansion would boost asset prices, strengthen the capital position of banks and induce them to further expand their balance sheets, not only domestically but also through international lending. At the same time, lower interest rates compress safe-asset yields, inducing banks to search for higher returns by taking on more risks.[42]

Given its prominence in international markets, the US dollar also plays a catalytic role, reinforcing the transmission channels of US monetary policy to cross-border flows. For instance, a US monetary policy tightening would be associated with a rise in the value of the US dollar. In turn, the appreciation of the US dollar would lead to a deterioration in the balance sheet and the perceived credit risk of non-US borrowers with US dollar liabilities, triggering further cross-border retrenchment worldwide. A monetary policy loosening would have the opposite effect.[43]

3.1 Global risk aversion and the global financial cycle

The first step of the analysis focuses on the relationship between capital flows and global risk aversion. The literature often uses the VIX index, a measure of

40 Miranda-Agrippino, S. and Rey, H., "US Monetary Policy and the Global Financial Cycle", NBER Working Paper No 21722, February 2018.

41 See "The international role of the euro", ECB, June 2018.

42 See Bruno, V. and Shin, H. S., "Capital flows and the risk-taking channel of monetary policy", *Journal of Monetary Economics*, Vol. 71, 2015, pp. 119-113, Cesa-Bianchi, A., Ferrero, A. and Rebucci, A., "International credit supply shocks", *Journal of International Economics*, Vol. 112(C), 2018, pp. 219-237, and Rey, H., "International Channels of Transmission of Monetary Policy and the Mundellian Trilemma", *IMF Economic Review*, Vol. 64, No 1, 2016.

43 See Bruno, V. and Shin, H. S. (2015), *ibid*.

implied volatility of the US stock market, as a proxy for global risk aversion.[44] Alternative measures aimed at capturing more "global" trends have also been proposed. For instance, Miranda-Agrippino and Rey find that the common component of a large panel of returns on risky assets traded on all the major global markets (i) co-moves with the VIX and the US Baa-Aaa spread and (ii) is strongly correlated with measures of implied stock price volatility in Europe (VSTOXX and VFTSE). Hence, rather than solely relying on the VIX, this analysis also uses a Global Stock Market Factor, constructed from stock returns for 63 countries (see Box 2 for details of the methodology). Both indicators, the VIX and the Global Stock Market Factor, should capture uncertainty about the future – as measured by the realised volatility of the markets – and the degree of risk aversion of the markets.[45] Compared with the VIX, the Global Stock Market Factor should better capture global developments.

Capital flows soared at the start of the new millennium, as both the VIX and the global factors declined, and collapsed during the global financial crisis in 2008-09, as risk aversion mounted. Chart 1a shows the development of capital flows, aggregated across all four categories and, separately, for advanced economies and for emerging economies against the VIX (inverted scale). Chart 1b displays aggregate capital flows against the Global Stock Market Factor (inverted scale). In both charts the co-movement of capital flows and proxies of risk aversion in the run-up to the global financial crisis and immediately afterwards is particularly evident. Importantly, it should be noted that between the early 2000s and 2009, there is an upward trend in capital inflows both for advanced and (to a lesser extent) for emerging economies. The process of financial integration is truly global.

Outside the crisis period, the relationship between capital flows and global risk is weaker than in the first decade of the 2000s, in particular when using the VIX index as a gauge of risk. Both Chart 1a and Chart 1b display a less marked pattern of co-movement of capital flows and the two proxies of global risk in the 1990s and since 2010 when the major central banks introduced quantitative easing measures that contributed to a decline in market volatility. This is confirmed by the correlation of these series over the whole sample and across three different decades, shown in Table 3. The correlation of the Global Stock Market Factor with global capital flows to either advanced economies (-0.61) or emerging economies (−0.51) is much tighter and more stable than the one of the VIX index (around -0.3). Notably, the negative relationship between the VIX and global capital flows is not present since 2010.

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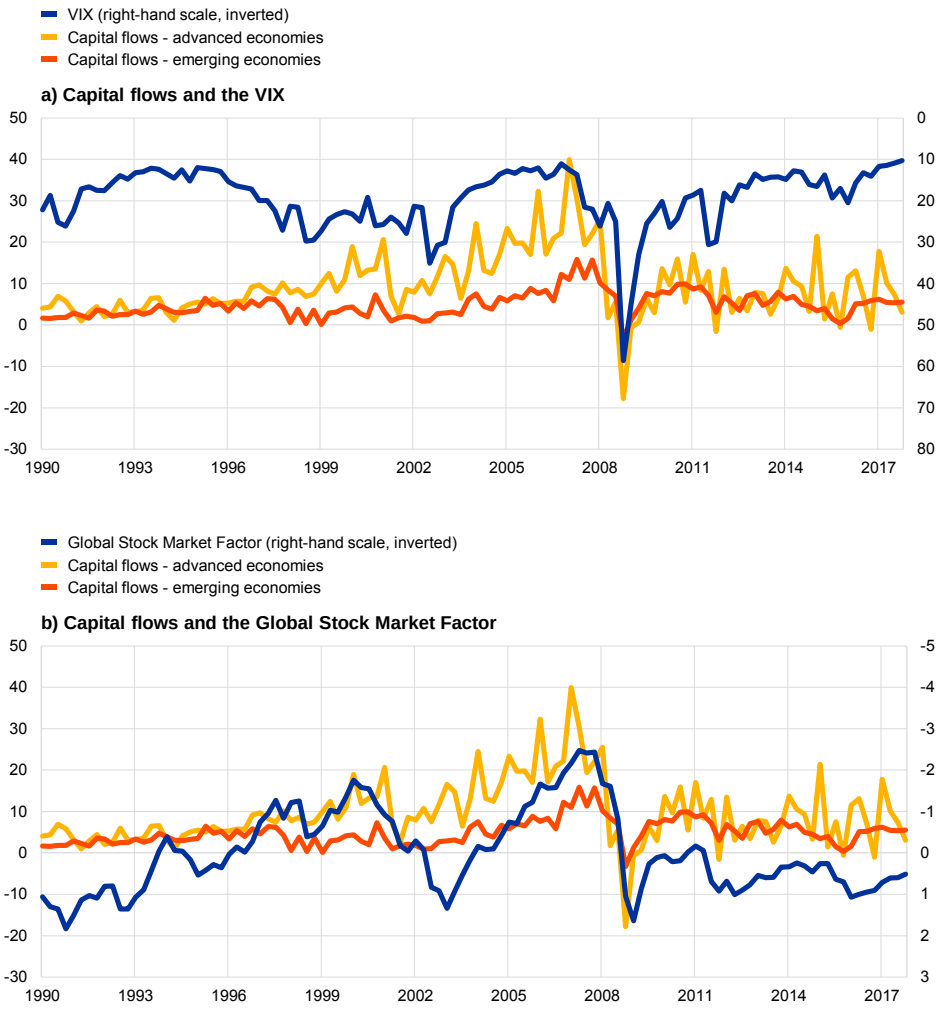
44 See for instance Habib, M. M. and Stracca, L. (2012) for an application to currencies ("Getting beyond carry trade: What makes a safe haven currency?", *Journal of International Economics*, Vol. 87, Issue 1, May 2012, pp. 50-64). The choice of the VIX can be justified on three grounds. First, implied volatility is strongly correlated across countries so that even country-specific variables mostly capture global trends. Second, the US stock market plays a central role in global financial markets owing to the importance of the US dollar. Third, the VIX is available for a long time span.

45 For a discussion, see Bekaert, G., Hoerova, M. and Lo Duca, M., "Risk, uncertainty and monetary policy", *Journal of Monetary Economics*, Vol. 60, No 7, 2013, pp. 771-788.

Chart 1

Capital flows, the VIX and the Global Stock Market Factor since 1990

(quarterly data, capital flows as a percentage of GDP)



Sources: IMF, Datastream and ECB calculations.
Notes: The latest observation is for the fourth quarter of 2017. Capital flows are reported as a share of the country group's GDP, i.e. capital flows to advanced economies divided by the sum of advanced economies' GDP, and similarly for emerging economies. The Global Stock Market Factor is constructed from stock returns for 63 countries (see Box 2 for details of the methodology).

A formal econometric analysis confirms that a Global Stock Market Factor shares a tight relationship with capital flows across different asset categories. The relationship between capital flows, stock market returns and several different measures of global risk is investigated empirically in a panel setting, including variables controlling for the influence of domestic ("pull") factors for capital flows. The results confirm that a global financial cycle in capital flows is strongly connected to measures of risk in global stock markets (see Box 1).

Table 3

Correlation of capital flows and global risk since the 1990s

Correlation matrices: sub-samples

(quarterly data)

	Capital flows – advanced	Capital flows – emerging	VIX	Global Stock Market Factor	US policy rate	Nominal USD appreciation
1990-2017						
Capital flows – **advanced**	1.00					
Capital flows – **emerging**	0.59*	1.00				
VIX	-0.27*	-0.34*	1.00			
Global Stock Market **Factor**	-0.61*	-0.51*	0.09	1.00		
US policy rate	0.11	-0.15	0.02	-0.35*	1.00	
Nominal USD appreciation	-0.38*	-0.46*	0.18	0.15	0.06	1.00
1990-1999						
Capital flows – **advanced**	1.00					
Capital flows – **emerging**	0.18	1.00				
VIX	0.53*	-0.33*	1.00			
Global Stock Market **Factor**	-0.70*	-0.32*	-0.32*	1.00		
US policy rate	0.14	-0.12	0.45*	0.14	1.00	
Nominal USD appreciation	-0.17	-0.13	-0.15	-0.07	-0.15	1.00
2000-2009						
Capital flows – **advanced**	1.00					
Capital flows – **emerging**	0.66*	1.00				
VIX	-0.73*	-0.57*	1.00			
Global Stock Market **Factor**	-0.64*	-0.71*	0.58*	1.00		
US policy rate	0.54*	0.36*	-0.36*	-0.81*	1.00	
Nominal USD appreciation	-0.43*	-0.49*	0.50*	0.12	0.12	1.00
2010-2017						
Capital flows – **advanced**	1.00					
Capital flows – **emerging**	0.31	1.00				
VIX	0.06	0.09	1.00			
Global Stock Market **Factor**	-0.33	-0.60*	-0.01	1.00		
US policy rate	-0.03	-0.09	-0.1	0.34	1.00	
Nominal USD appreciation	-0.12	-0.56*	0.21	0.25	-0.27	1.00

Sources: IMF, Datastream and ECB calculations.
Notes: Capital flow liabilities as a percentage of GDP. US policy rate refers to the effective federal funds rate extended with the Wu-Xia shadow rate. Nominal USD appreciation is calculated as the log change in the nominal effective exchange rate (NEER). * Asterisk indicates statistical significance at the 5% level.

As mentioned in the introduction, the global financial cycle could limit the ability of policymakers to isolate domestic financial conditions. Even when adopting a flexible exchange rate regime – which allows for some independence in setting policy rates according to existing evidence[46] – a global risk shock would be transmitted across the globe to capital flows and risky asset prices, irrespective of the prevailing exchange rate regime (*dilemma hypothesis*).

[46] See Obstfeld, M., Shambaugh, J. and Taylor, A., "The trilemma in history: tradeoffs among exchange rates, monetary policies, and capital mobility", *Review of Economics and Statistics*, Vol. 87(3), 2005, pp. 423-438.

The econometric evidence partly supports the presence of a dilemma in the transmission of global risk to capital flows and stock markets (see Box 1). Indeed, the analysis shows that global risk affects capital flows in those economies that have liberalised the capital account, as predicted by the theory. At first sight, the exchange rate regime does not seem to matter in the transmission of global risk. The irrelevance of the exchange rate regime is consistent with the existence of a dilemma, not a trilemma, in the presence of a global financial cycle. However, when restricting the sample to those economies that have a liberalised capital account, a rigid exchange rate regime appears to facilitate a stronger transmission of global risk to stock markets, providing support to the traditional view of the trilemma in international economies, where floating rates allow for a degree of freedom in facing external shocks.

Box 1
The transmission of global risk factors and the policy trilemma

Prepared by Maurizio Michael Habib

The transmission of global risk to capital flows and stock prices is studied in a simple panel regression across a sample of 50 economies. The model is the following:

$$Y_{it} = a_i + bX_t + c\bar{Z}_{it} + e_{it}$$

where Y_{it}, the dependent variable, is one of the four main categories of capital flows – direct investment, portfolio equity, portfolio debt or other flows – or stock returns in country *i* at time (quarter) *t*. The coefficient a_i captures country-specific fixed effects that do not vary across time; Z_{it} is a vector of domestic control variables that can affect capital flows and returns, including domestic inflation and real GDP growth; and, finally, X_t is a proxy of global risk and e_{it} is an error term.[47] Alternatively, two different proxies of risk have been included: the VIX and the Global Stock Market Factor.

Table A presents the results of these regressions for two different models, one including the VIX (model 1) and one using the Global Stock Market Factor (model 2). The coefficients of the control variables are omitted for space reasons. As expected, most of the coefficients are negative, suggesting that when global risk rises, cross-border capital flows and risky asset prices decline around the world. Zooming into different types of capital flows, direct investment emerges to be less sensitive to global risk, since the decision to invest abroad is based on long-run expectations of profitability. Among the various proxies of risk, the Global Stock Market Factor is the indicator most closely connected to capital flows and stock prices, since the coefficient is statistically significant for all types of flows and the regression displays the best goodness of fit.[48] However, the ability of the model to capture the volatility of capital flows – particularly high at the quarterly frequency – is very limited, as shown by the reported R-squared. For stock returns, instead, the change in the Global Stock Market Factor has a good fit and explains one-third of the variation of the stock returns. Overall, this simple model confirms that a global financial cycle in capital flows and asset prices is negatively associated with global risk.

47 The model is estimated with a Driscoll-Kraay estimator accounting for cross-sectional and temporal dependence of the residuals. The results are robust to the inclusion of different lags of the dependent variable.

48 For consistency with how it is constructed, the Global Stock Market Factor enters the equation for equity returns in first differences.

Table A

The transmission of global risk to capital flows and asset prices

Dependent variable	Foreign direct investment	Portfolio equity	Portfolio debt	Other investment	Stock returns
Model 1					
VIX	0.007	-0.004**	-0.012**	-0.017	-0.006**
R-squared	0.009	0.007	0.006	0.01	0.15
Model 2					
Global Stock Market Factor	-0.246***	-0.045**	-0.146***	-0.398***	-0.203**
R-squared	0.034	0.011	0.013	0.029	0.332
Observations	5,032	4,731	4,815	4,996	5,040
Countries	50	48	49	50	50

Sources: IMF, Datastream and ECB calculations.
Notes: For stock returns, in model 2, the Global Stock Market Factor is taken in first differences. The asterisks ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

An extension of the model makes it possible to consider an interesting policy angle: the role of capital account openness and the exchange rate regime in the transmission of risk to capital flows and risky asset prices. According to the new "dilemma" in international finance, once the capital account is open, a floating exchange rate cannot isolate the domestic economy from the transmission of shocks driving the global financial cycle, such as risk aversion shocks. To test this hypothesis, the model is augmented with two dummies distinguishing countries with a higher than average degree of capital account openness (Open) from those that are more closed, and countries with a fixed exchange rate regime (Peg) from those with a floating regime.[49] These dummies are interacted with the global risk factor to control if the transmission of risk shocks is stronger among countries with a fixed exchange rate (*trilemma hypothesis*) or not (*dilemma*). Among the risk factors, the Global Stock Market Factor has been selected, since it performed better in the first stage of the analysis compared with the VIX.

[49] Capital account openness is measured using the de jure index developed by Chinn, M. D. and Ito, H., "What Matters for Financial Development? Capital Controls, Institutions, and Interactions", *Journal of Development Economics*, Vol. 81, Issue 1, October 2006, pp. 163-192. The exchange rate regime classification is based on Ilzetzki, E., Reinhart, C. M. and Rogoff, K. S., "Exchange Arrangements Entering the 21st Century: Which Anchor Will Hold?", NBER Working Paper No 23134, February 2017.

Table B

The transmission of global risk: the role of capital account liberalisation and the exchange rate regime

Dependent variable	Foreign direct investment	Portfolio equity	Portfolio debt	Other investment	Stock returns
Full sample: the role of capital account liberalisation					
Global Stock Market Factor	-0.113***	-0.055***	-0.035	-0.014	-0.216***
Global Stock Market Factor*Open	-0.200***	0.014	-0.166**	-0.593***	0.020
Observations	4,976	4,692	4,772	4,940	4,969
Countries	50	48	49	50	50
R-squared	0.038	0.012	0.019	0.041	0.337
Full sample: the role of the exchange rate regime					
Global Stock Market Factor	-0.194***	-0.042*	-0.115***	-0.360***	-0.199***
Global Stock Market Factor*Peg	-0.103*	-0.008	-0.062	-0.075	-0.007
Observations	5,032	4,731	4,815	4,996	5,007
Countries	50	48	49	50	50
R-squared	0.036	0.012	0.014	0.029	0.333
Economies with a higher than average degree of capital account liberalisation: the role of the exchange rate regime					
Global Stock Market Factor	-0.230***	-0.029	-0.173***	-0.568***	-0.177***
Global Stock Market Factor*Peg	-0.147*	-0.018	-0.054	-0.039	-0.033***
Observations	3,228	3,048	3,148	3,228	3,206
Countries	43	40	42	43	43
R-squared	0.037	0.001	0.019	0.046	0.395

Sources: IMF, Datastream and ECB calculations.
Notes: For stock returns, the Global Stock Market Factor is taken in first differences. The asterisks ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Table B summarises the results, focusing on the global risk factor and its interaction with the dummies, omitting other controls. A negative coefficient for the interaction term of global risk with a specific characteristic (e.g. Open or Peg) suggests that the countries possessing that feature are more affected by global risk. First, as expected, the transmission of global risk to capital flows and asset prices is stronger among those economies with a more open capital account, in particular for direct investment, portfolio debt and other investment (e.g. bank loans), as the interaction term is negative and statistically significant. Second, at first sight, the exchange rate does not seem to matter. Even though the coefficient of the dummy for countries pegging their currency interacted with global risk is negative, the statistical significance is weak. This provides support to the new theory of the global financial cycle that stresses the limited ability of a floating rate to shield domestic financial conditions from the global ones. It is possible to qualify this result, analysing a finer partition of the sample. Focusing on the countries that are relatively more open – those potentially more exposed to the global financial cycle – the transmission of global risk to stock prices is higher among pegs than for floaters, supporting the traditional trilemma hypothesis.

Summing up, global risk aversion emerges as a significant driver of capital flows and stock returns and its impact is amplified by capital account openness, but not necessarily by the exchange rate regime, which matters only for asset prices when the capital account is open, not for capital flows.

3.2 US monetary policy and the global financial cycle

Empirically, there is a broad consensus that monetary policy actions of large central banks, such as the Federal Reserve System, spill over to global financial markets. A wealth of studies have shown that monetary policy decisions by the Federal Reserve have an impact on capital flows, exchange rates and the international co-movement of asset prices. These papers generally find that a tightening of US monetary policy significantly influences foreign economies via an increase of foreign long-term interest rates and a depreciation of their currencies against the US dollar. Furthermore, the transmission to foreign long-term rates is mostly attributable to effects on term premia.[50]

However, there does not seem to be a stable relationship between the US policy rate, the value of the US dollar and global capital flows. Chart 2a and Table 3 show that the US interest rate – specifically the effective federal funds rate extended with the Wu-Xia shadow rate[51] during the zero lower bound period – is generally uncorrelated with global capital flows, with the exception of the crisis. In the 2000s, the correlation of US interest rates with capital flows is positive – not negative as expected – and the correlation with indicators of risk aversion such as the VIX is negative – not positive as expected. In the run-up to the global financial crisis, US interest rates increased in tandem with cross-border capital flows and when the global financial crisis erupted, the Federal Reserve was forced to ease monetary policy.

The value of the US dollar is negatively correlated with capital flows, even though the relationship is clearly driven by the cycle in the run-up to the global financial crisis. Chart 2b shows that the nominal effective exchange rate of the US dollar depreciated from 2002 to the onset of the global financial crisis in the autumn of 2008. During this period, capital flows were on an upward trend among advanced and emerging economies. The crisis signals a turning point for both the US dollar, which appreciates sharply, and capital flows, which retrench dramatically. However, outside the period 2000-09, the relationship is less stable. Table 3 reports the correlation of the value of the US dollar – taken in log changes to avoid issues of stationarity in the series – with capital flows, confirming a tight negative relationship between 2000 and 2009 – a correlation coefficient ranging between -0.43 for advanced economies and -0.49 for emerging ones – and a looser connection in the 1990s for both advanced and emerging economies and since 2010 for advanced economies.[52] Possibly, the impact of monetary policy and the role of the US dollar on the global financial cycle

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50 Neely, C., "The Large Scale Asset Purchases Had Large International Effects", *Journal of Banking and Finance*, Vol. 52, March 2014, pp. 101-111, Rogers, J. H., Scotti, C. and Wright, J. H., "Evaluating Asset-Market Effects of Unconventional Monetary Policy: A Multi-Country Review", *Economic Policy*, Vol. 29, No 80, 2014, pp. 3-50, and Jarociński, M. and Karadi, P., "Deconstructing monetary policy surprises: the role of information shocks", *Working Paper Series*, No 2133, ECB, 2018. ECB monetary policy has similar effects; see, for instance, "Monetary policy, exchange rates and capital flows", speech by Benoît Cœuré, Member of the Executive Board of the ECB, at the 18th Jacques Polak Annual Research Conference hosted by the International Monetary Fund, Washington D.C., 3 November 2017.

51 Wu, C. and Xia, D., "Measuring the Macroeconomic Impact of Monetary Policy at the Zero Lower Bound", *Journal of Money, Credit and Banking*, Vol. 48, March 2016, pp. 253-291.

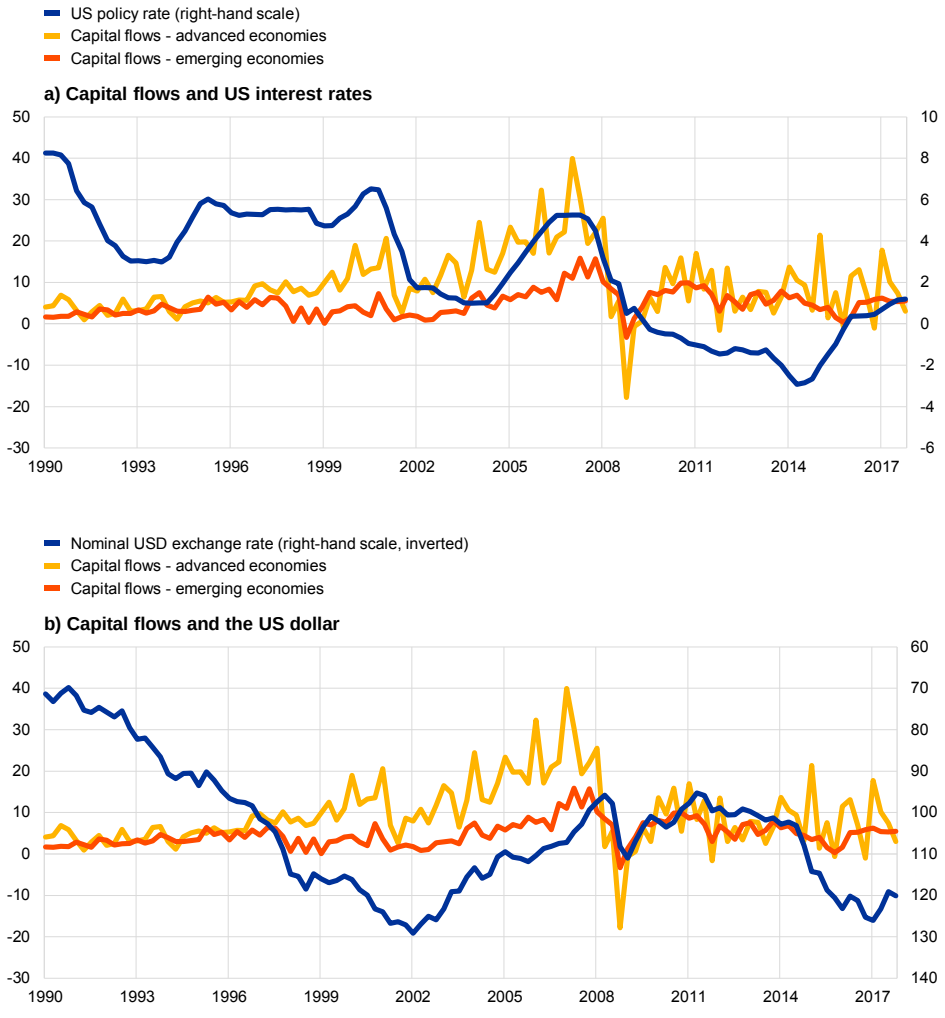
52 Over the past few years, the relationship between capital flows and the US dollar has remained significantly negative for emerging markets. This outcome may be explained by the increased attractiveness of the US dollar as a safe haven since the start of the global financial crisis. It is possible to note that the value of the dollar is positively correlated with risk factors (around 0.2) since 2010, but not in the 1990s.

should be analysed with different techniques, e.g. through the identification of monetary policy shocks with high-frequency data and VAR analysis; however, this would go beyond the scope of this article.[53]

Chart 2

Capital flows, US interest rates and the US dollar since the 1990s

(quarterly data; capital flow liabilities as a percentage of GDP; US policy rate as a percentage; nominal USD exchange rate, index: Jan. 1997 = 100)



Sources: IMF, Datastream and ECB calculations.
Notes: The latest observation is for the fourth quarter of 2017. Capital flows are reported as a share of the country group's GDP, i.e. capital flows to advanced economies divided by the sum of advanced economies' GDP, and similarly for emerging economies. US policy rate refers to the effective federal funds rate extended with the Wu-Xia shadow rate. Nominal USD exchange rate refers to the nominal broad trade-weighted exchange value of the US dollar, where an increase in the index denotes an appreciation (note the inverted scale in Chart 2b).

[53] Replacing the level of US interest rates with US monetary policy shocks identified with high-frequency data or an index of US monetary policy uncertainty does not substantially alter these findings. In a dynamic panel setting similar to the one introduced in Box 1, distinguishing between different types of capital and controlling for pull factors, US monetary policy shocks are negatively related to portfolio equity flows and stock returns, but not to other types of capital flows.

3.3 Summary of the empirical evidence

Overall, the evidence reviewed here suggests that capital flows and risky asset prices have been influenced by global risk factors in the past decades. This influence is particularly evident in the period preceding the global financial crisis and in its immediate aftermath. Notably, the most recent period has instead been characterised by a loosening of the cycle. Moreover, the exchange rate regime does not seem to matter for the transmission of the cycle, with the possible exception of risky asset prices when the capital account is open.

While the central role of US monetary policy and the presence of a US dollar cycle connected to the global financial cycle is a concept well entrenched among economists, more work is needed to pin down the economic significance of these drivers of the financial cycle for the global economy. In different terms, while the existence of a causal nexus between US monetary policy and capital flows cannot be excluded, the quantitative relevance of changes in US interest rates for international capital flows appears limited and would have to be ascertained. This implies that the risks for global capital flows and risky asset prices of a gradual, well-communicated normalisation of US monetary policy should not be exaggerated.[54]

4 Implications for the euro area

The euro area is not an island: product and financial market openness make the euro naturally exposed to changes in global financial conditions. In the previous sections, a connection between, on the one hand, global risk aversion and, on the other hand, capital flows and stock returns has been outlined. This section delves into the implications of the observed co-movement in asset prices for euro area financial conditions. The transmission of global shocks to the euro area economy is amplified by the presence of large, global euro area banks that play a central role in international lending. Due to its size and interconnectedness, however, the euro area is not only a receiver but also a generator of shocks that affect the global financial cycle.[55]

Given the prominence of the US economy in driving the financial cycle, it is interesting to focus on the relationship between US and euro area financial conditions. This can be done using composite "financial condition indices" that assemble information from a small set of financial variables.[56] We look at two such

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54 See the speech by the Federal Reserve Chairman J. H. Powell entitled "Monetary Policy Influences on Global Financial Conditions and International Capital Flows" at "Challenges for Monetary Policy and the GFSN in an Evolving Global Economy", Eighth High-Level Conference on the International Monetary System sponsored by the International Monetary Fund and the Swiss National Bank, Zurich, Switzerland, 8 May 2018.

55 For instance, recent analyses show that the ECB's asset purchase programme (APP) has triggered substantial capital flows across borders, favouring a substantial portfolio adjustment towards foreign sovereign bonds and increasing the average maturity of bonds in the portfolios. Also, APP announcements have caused a broad-based depreciation of the euro and boosted equity prices around the world; see "The international dimension of the ECB's asset purchase programme", speech by Benoît Cœuré, Member of the Executive Board of the ECB, at the Foreign Exchange Contact Group meeting, 11 July 2017.

56 See, for instance, "Financial conditions and growth at risk", Global Financial Stability Report, IMF, October 2017, Chapter 3.

indices, which convey slightly different information. The first index, computed by Goldman Sachs, gives a relatively large weight to the *level* of interest rates paid by sovereigns and corporates and also takes into account the tightening effects of exchange rate appreciations.[57] The second index, computed by Bloomberg, assigns more importance to interest rate spreads, as well as realised volatilities in bond, stock and money markets. Furthermore, it does not include exchange rates. It is therefore more indicative of rising financial turbulence, as gauged by time-varying risk premia.[58] In other words, the prominence given by the latter index to spreads and volatilities implies that it is more sensitive to temporary financial tensions. Although both indices are defined as measures of financial conditions, for the sake of exposition we will refer to them in the rest of the discussion as indices of *financial conditions* and *financial tensions,* respectively.

The degree of synchronisation of financial conditions between the United States and the euro area is overall tenuous and changes over time, also reflecting differences in the monetary policy stance. Chart 3a shows the index of financial conditions for the United States and for the euro area between 2000 and 2018.[59] In the case of the United States, three distinct periods of financial tightening can be identified. The first, between 2001 and 2003, coincides with the bursting of the dot-com bubble in the US stock market. The second follows the bankruptcy of Lehman Brothers. The third, from the middle of 2014 to the beginning of 2016, is largely driven by an appreciation of the dollar. The timeline for the euro area is characterised by two important differences. First, the impact of the 2001 US recession is very muted. Second, the tightening of financial conditions during the Great Recession (2008-09) is much more gradual and less pronounced. These differences show up in notably different correlations across time periods. Before the financial crisis, the correlation in financial conditions is mildly positive (0.33); it increases during the crisis (0.71 between 2007 and 2012); and from July 2012 onwards it turns negative.[60] The change in sign reflects the progressive loosening of financial conditions in the euro area, also thanks to monetary policy accommodation and the relative stability (bar the temporary tightening of financial conditions between 2014 and 2016) in the United States.

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57 The index, computed by Goldman Sachs, is a weighted average of a short-term interest rate, a long-term riskless bond yield, a corporate credit spread, the ratio of an equity index to a lagged ten-year average of earnings per share, and a trade-weighted exchange rate. In the case of the euro area, the index also includes a measure of fragmentation, i.e. a sovereign credit spread. It assigns to the different indicators a weight that reflects their predictive content for GDP four quarters ahead which is also inversely related to their standard deviation.

58 The indices are computed by Bloomberg. The index for the United States includes: (i) for money market rates, the TED spread, the LIBOR/OIS spread and the commercial paper/T-bill spread; (ii) for the bond market, the Baa corporate/Treasury spread, the municipal/Treasury spread, the high-yield Treasury spread and the swaption volatility index; and (iii) for the stock market, the VIX and the deviation of Standard & Poor's share prices from their five-year moving average. All the components are aggregated using equal weights. For the euro area, the index includes: (i) for money market rates, the euro TED spread and the EURIBOR/OIS spread; (ii) for the bond market, the JP Morgan High Yield Europe Index and the EU ten-year swap spread; and (iii) the deviation of EURO STOXX share prices from their five-year moving average, the VDAX-NEW index and de-trended share prices.

59 The indicators are in deviations from a historical mean and standardised, so that periods in which they are positive (negative) indicate financial conditions being tight (loose) relative to their mean level.

60 July 2012 is taken as the cut-off period to account for changes in market expectations about the likelihood of the ECB adopting unconventional monetary policy measures following the speech given by Mario Draghi, President of the ECB, at the Global Investment Conference in London on 26 July 2012.

The co-movement in financial tensions is instead very strong. Chart 3b shows the two indices of financial tensions for the United States and for the euro area. It is evident that financial tensions are, most of the time, dormant. However, when they manifest themselves (in 2008 both in the United States and in the euro area and in 2011 mainly in the euro area) they have a large impact on the real economy, possibly generating non-linear effects. Overall, the correlation between the two indices is strong and stable (ranging between 0.8 and 0.9), suggesting that (i) financial tensions are triggered by movements in global risk and (ii) risk premia both in the United States and in the euro area are heavily influenced by this common component (see Box 2).[61]

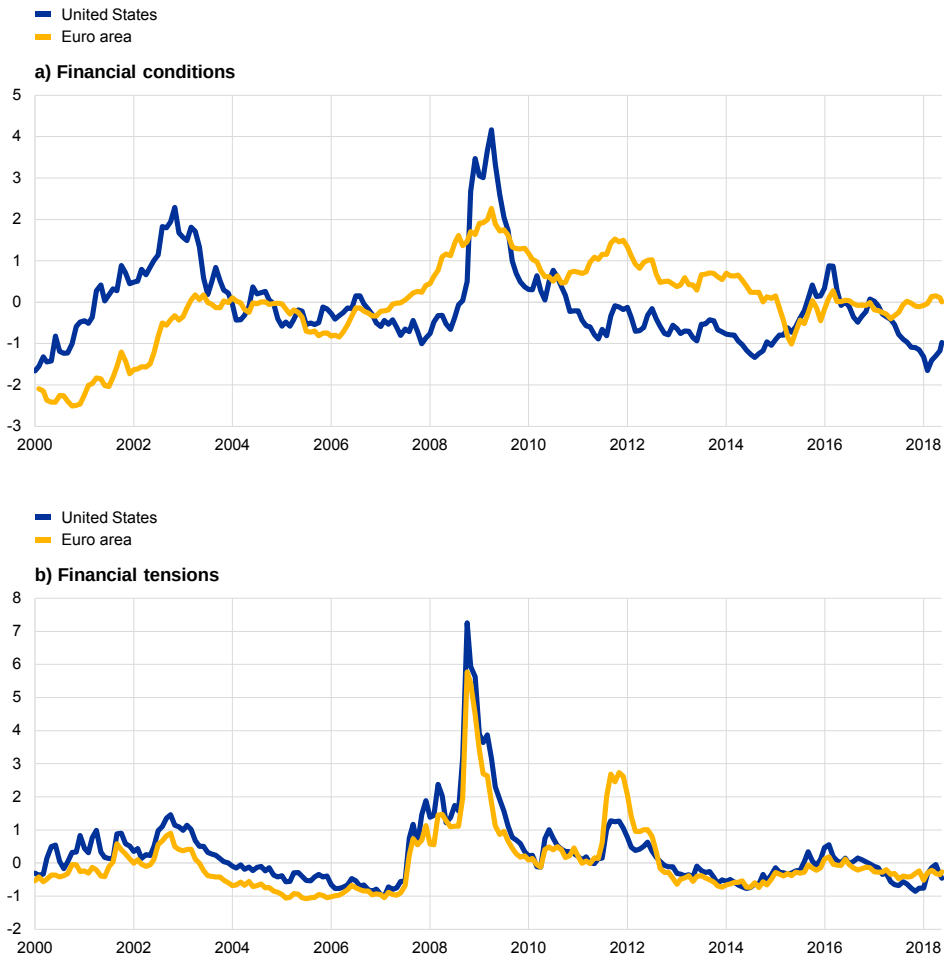
Overall, two key messages emerge from this analysis. First, financial conditions in the euro area evolve largely independently from global forces, also thanks to the ability of monetary policy to steer expected rates on safe assets and term premia in the desired direction. Second, credit spreads and realised volatilities in the United States and in the euro area are highly synchronised, reflecting the global nature of risk appetite in closely financially integrated markets.

[61] An interesting observation is that the crisis that originated in the United States in 2008 had a stronger impact on the euro area than the euro area sovereign debt crisis had on the United States. While more refined analyses would be needed to ascertain the strength of the respective causal effects, it is plausible that the strong activity of euro area banks in the United States amplified the effects of the US crisis on the euro area economy.

Chart 3

Financial conditions and financial tensions in the United States and in the euro area

(Z-scores of monthly averages of daily data, i.e. number of standard deviations from zero)



Sources: Goldman Sachs and Bloomberg Analytics.
Notes: The latest observation is for June 2018. The financial condition indices refer to the Goldman Sachs (panel a) and Bloomberg (panel b) constructed financial condition indices for the United States and the euro area. Positive deviations from zero signify a tightening, while negative deviations from zero signify a loosening.

Box 2

The global financial cycle: is the euro area special?

Prepared by Fabrizio Venditti

This box documents how the Global Stock Market Factor is computed and explores its relative importance for euro area stock returns. A dynamic factor model for stock returns in 63 countries is estimated. The first common factor is the Global Stock Market Factor.[62] Once this factor is estimated, its relevance for the individual indicators can be assessed through simple variance decomposition. More formally, for each country "*i*" at time "*t*" we have:

$$y_{i,t} = \theta_i f_t + \varepsilon_{i,t}$$

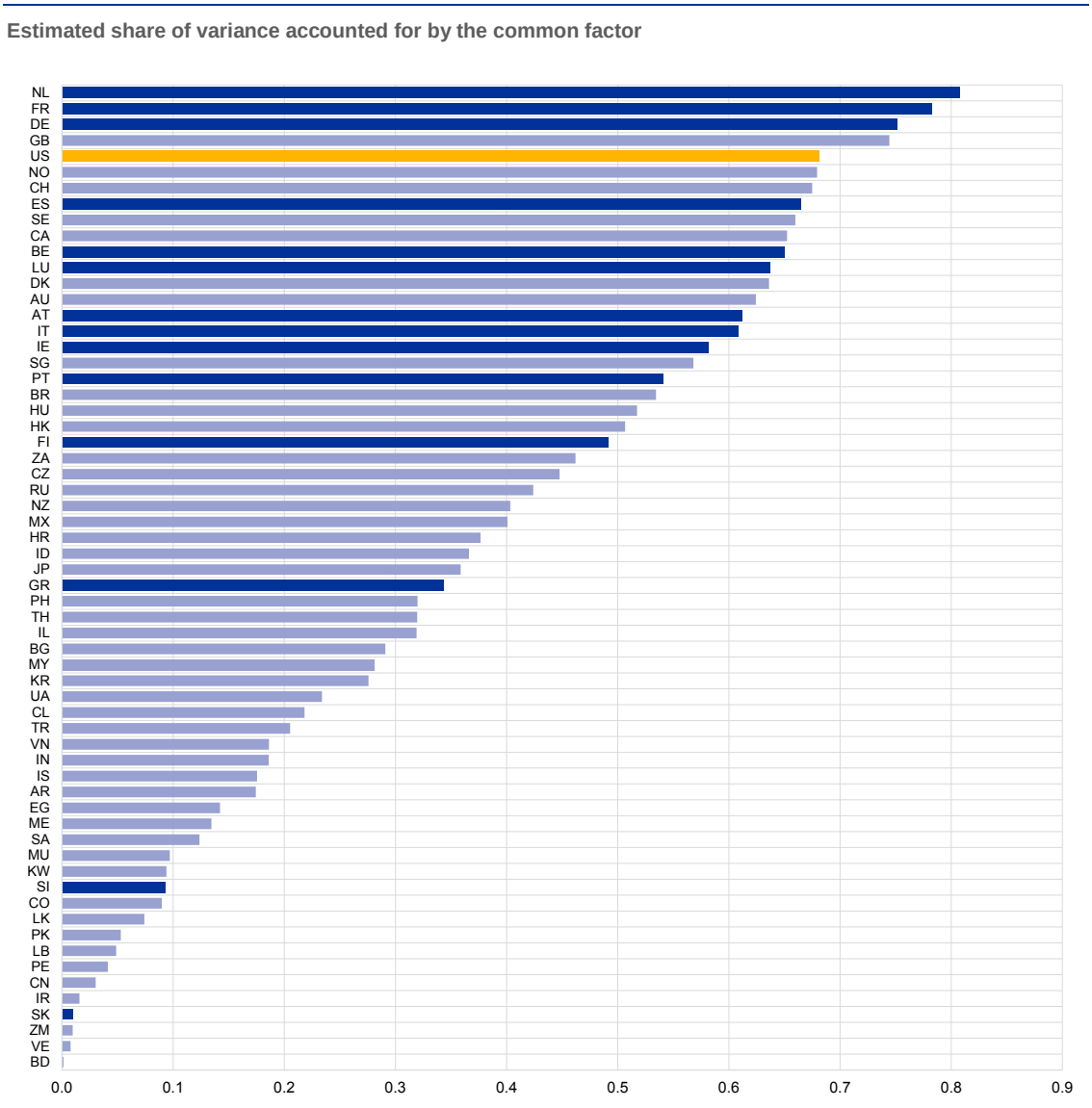
[62] The methodology follows Miranda-Agrippino and Rey (2015). Nevertheless, this exercise uses only national averages of equity returns and does not consider the prices of risky bonds.

where $y_{i,t}$ is either stock returns or cross-border flows, f_t is a common factor, and $\varepsilon_{i,t}$ is an idiosyncratic component (with variance σ_i^2) that accounts for the part of $y_{i,t}$ that is not common across countries. Since f_t and $\varepsilon_{i,t}$ are uncorrelated, we can estimate the share of variance of $y_{i,t}$ accounted for by the common factor as $\frac{\theta_i^2}{\theta_i^2+\sigma_i^2}$. Estimation is carried out on a set of 63 countries, comprising advanced and emerging economies.

Chart A shows the estimated share of variance accounted for by the Global Stock Market Factor in the 63 countries considered. Two results stand out. First, commonality is very heterogeneous across countries. Second, the relevance that the global factor has for the equity returns of euro area countries (dark blue bars) and the United States (yellow bar) is overall comparable, indicating that global shocks are an important factor in shaping both euro area and US equity price movements.

Chart A

Degree of commonality of country-specific stock returns



Source: ECB calculations.

5 Concluding remarks

Real economy and financial market integration over the past decades has influenced the synchronisation of capital flows and asset prices across the world. Some authors have advocated the existence of a global financial cycle that manifests itself through the co-movement of cross-border flows and translates into more aligned risky asset prices and external finance premia across different economies. This was the case in the run-up to the global financial crisis and in its aftermath, in particular for cross-border banking flows among advanced economies and for stock prices. However, after the crisis, the synchronisation of capital flows and stock prices has abated, returning to the levels observed between the 1990s and the 2000s.

The global financial cycle is closely connected to global risk factors. A measure of global risk aversion (constructed as the common factor that drives a panel of equity returns) has a significant impact on capital flows and stock returns. Moreover, capital account openness – but not necessarily the exchange rate regime – amplifies the effects of global risk aversion. The exchange rate regime matters only for the transmission of global risk to asset prices when the capital account is open. The impact of US interest rates and the US dollar exchange rate on capital flows, instead, appears to be episodic.

The influence of the global financial cycle on the euro area depends on the particular measure that is analysed. The article finds that financial market *tensions* have typically been synchronised between the two areas. Bouts of volatility, which can have strong non-linear effects on economic activity, are quickly transmitted from one economy to the other. However, financial *conditions* in the euro area have often decoupled from those in the United States, also owing to differences in the monetary policy stance. Overall, this confirms that the effectiveness of the ECB's monetary policy has not been impaired by the global financial cycle.

2 Interpreting recent developments in market-based indicators of longer-term inflation expectations

Prepared by Benjamin Böninghausen, Gregory Kidd and Rupert de Vincent-Humphreys

Private sector inflation expectations are a key component of a broad range of indicators that the ECB considers when determining the appropriate monetary policy stance for achieving its price stability objective. Inflation expectations can not only affect inflation itself through the wage and price-setting processes, but also serve as a useful cross-check on the ECB's and the Eurosystem's own projections.

This article focuses on market-based measures of longer-term inflation expectations, which are timely indicators derived from the prices of instruments that are traded in financial markets and linked to future inflation outcomes. It reviews recent developments in the information that can be extracted from different types of market-based indicator, starting from the period leading up to the ECB's announcement of its expanded asset purchase programme (APP).

The fall in market-based indicators of longer-term inflation expectations between 2014 and mid-2016 was consistent across major jurisdictions, possibly reflecting global concerns about weak aggregate demand and associated disinflationary pressures. Their subsequent recovery has been driven by a partial dissipation of these concerns and, in particular, a significant improvement in the euro area macroeconomic environment. The lion's share of the movement in longer-term inflation expectations over the past few years has stemmed from the inflation risk component of these indicators, suggesting that the balance of risks to the inflation outlook has been one of the main drivers. Indeed, information extracted from the prices of inflation options implies that the risk-neutral probability of deflation increased noticeably in late 2014 and early 2015, before declining more recently.

1 Introduction

Inflation expectations play a central role in the ECB's monetary policy, as its primary and overriding objective is to maintain price stability in the euro area. In 1998 the ECB's Governing Council defined price stability as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%. In 2003 it then clarified that in the pursuit of price stability it aims to maintain inflation rates at levels below, but close to, 2% over the medium term. In this context, private agents' inflation expectations serve two main purposes in the conduct of monetary policy. First, inflation expectations are relevant in their own right in that they influence private agents' economic decisions in areas such as consumption and investment, as well as wage and price setting, and thus euro area inflation. Similarly, financial market participants' inflation expectations are relevant in the pricing of other financial instruments, such as nominal bonds, and can thus directly affect the transmission of monetary policy to the real economy. Second, they serve as a valuable cross-check on

the inflation outlook in the Eurosystem/ECB staff macroeconomic projections, which in turn inform the ECB's monetary policy decisions.

The ECB therefore closely monitors private agents' inflation expectations in the form of both survey-based and market-based measures. Survey-based measures reflect future inflation expectations, as expressed directly in the context of regular expert surveys conducted on a monthly or quarterly basis. One such survey that plays a prominent role in the ECB's monetary policymaking is its own Survey of Professional Forecasters (SPF), a quarterly survey of experts affiliated with financial and non-financial institutions based in the European Union. By contrast, market-based measures reflect the information derivable from the prices of financial instruments, such as inflation-linked swaps (ILSs), inflation-linked bonds or inflation options, which are linked to future inflation outcomes. Since such financial instruments are traded continuously, market-based measures not only provide additional valuable information on the inflation expectations of informed investors, but can also give more timely indications of potential shifts in the inflation outlook. Furthermore, they embody not only the inflation expectation, but also a premium related to inflation uncertainty, which can vary over time. Despite these differences, both survey-based and market-based indicators of inflation expectations are part of a broad range of indicators that the ECB considers in its monetary policy decision-making.

This article reviews recent developments in market-based measures of euro area inflation expectations, in particular the shift in the balance of risks to the inflation outlook since 2014. Following on from an earlier review of market-based indicators of euro area inflation that covered the impact of the global financial crisis,[63] the present article examines both the phase of weakening inflation dynamics in the run-up to the ECB's launch of the APP as a (further) non-standard monetary policy measure and the evolution of market-based measures of inflation expectations thereafter. Section 2 of the article explores the drivers of market-based indicators of inflation expectations over the two aforementioned periods, also drawing on a model-based analysis. Section 3 focuses on one of the main drivers, namely the shift in the balance of risks to the inflation outlook, which is inferred from information derived from option prices, and corroborated by information extracted from the ECB SPF. Box 1 sheds some light on the conclusions drawn in Section 3 by highlighting the important difference between risk-neutral and "physical" probabilities.

2 Review of recent developments in market-based measures of inflation expectations and their drivers

This section reviews recent developments in investors' longer-term inflation expectations by analysing the evolution of inflation-linked swap (ILS) rates. An ILS is a derivative contract that involves an exchange of a payment defined in terms of a fixed rate on a notional amount (the "fixed leg" of the swap) for a payment defined in terms of the realised inflation rate over a predetermined horizon on that same notional amount. Only the net cash flows are exchanged at the maturity of the swap, i.e. the

63 See the article entitled "Inflation expectations in the euro area: a review of recent developments", *Monthly Bulletin*, ECB, February 2011.

difference between the rate on the fixed leg and the realised inflation rate applied to the notional value of the contract.[64] Thus, the ILS rate on the contract is indicative of the market's expected inflation rate over the relevant horizon. The swap contract is usually linked to a non-seasonally adjusted consumer price index (CPI). In the euro area, the relevant index is the HICP excluding tobacco (HICPxT), while in the United States it is the Consumer Price Index for All Urban Consumers (CPI-U) and in the United Kingdom it is the Retail Price Index (RPI).

ILS rates provide a cleaner measure of longer-term inflation expectations than bond-derived break-even inflation rates (BEIRs). The latter is calculated as the spread between nominal and inflation-linked bond yields, often of a particular euro area country. Currently, Germany, France, Italy and Spain all have inflation-linked bonds which refer to the euro area HICPxT. In contrast to ILS rates, BEIRs can be influenced by significant time-varying liquidity effects and country-specific risk premia.[65] Therefore, market participants prefer to use market-based measures of longer-term inflation expectations derived from ILS rates rather than from BEIRs.

However, ILS rates still contain risk premia as compensation for inflation risk exposure. As with all indicators derived from financial market prices, ILS rates are not immune to the influence of risk premia. In particular, ILS rates contain an inflation risk premium which compensates investors for the risks surrounding their central estimates of inflation over the forecast horizon. The inflation risk premium also has informational content – it is not just a correction that needs to be applied in order to reveal central expectations, it also tells us which inflation outcomes investors care about most. Although the inflation risk premium is unobservable, it can be estimated either by modelling the inflation swap curve with an affine term structure model or by using a non-model-based proxy, such as the differential between market-based and survey-based inflation expectations. Both approaches imply that the lion's share of the movement in ILS rates over the past few years has been due to fluctuations in inflation risk premia.

During the period from 2014 to mid-2016, ILS rates fell significantly across major jurisdictions (see Chart 1). A widely used measure of longer-term market-based inflation expectations is the "5y5y ILS rate", i.e. the average inflation rate over a five-year period starting in five years' time, as implied by ILS rates. We examine two distinct periods in 5y5y ILS rate developments. First we look at the period from 2014 to mid-2016 when 5y5y ILS rates fell considerably across major jurisdictions. In the euro area, the 5y5y ILS rate fell by almost 1 percentage point,

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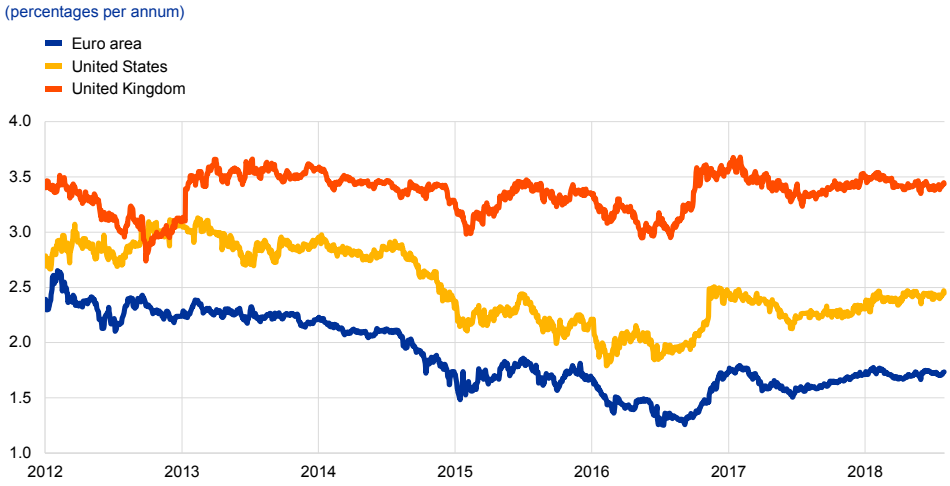
64 For example, if counterparty A wishes to hedge against unexpectedly high inflation over the next year, it may enter into a one-year ILS contract with counterparty B for a notional amount of, for illustrative purposes, €1 million and pay a fixed leg of 1.90% to counterparty B. If at the end of the contract, realised inflation were to stand at 2.50%, counterparty A would receive a net payment of €6,000 = [€1 million * (2.50%-1.90%)] from counterparty B (who owes realised inflation to counterparty A). To hedge against lower than expected inflation, counterparty A can enter into the other side of this contract (that counterparty B undertakes in this example). In any case, the net pay-off to either counterparty is a linear function of the level of realised inflation. Note that this example is highly simplified and does not account for some technicalities, such as indexation lags, that are present in ILS contracts.

65 For example, during the euro area sovereign debt crisis there were distortions in the market prices for the sovereign debt of some euro area countries. In particular, concerns regarding Italy's sovereign credit risk were reflected in an increase in bond yields, which was more pronounced in inflation-linked bonds, thus depressing the implied BEIR. More recently, during periods of financial market risk aversion, safe haven flows into nominal German bonds have tended to depress the implied BEIR on German debt.

down from around 2.20% to 1.20%, while in the United States and the United Kingdom it went down by 1.10 percentage points (to 1.85%) and 0.70 percentage point (to 2.90%) respectively. We then look at the period since mid-2016, during which ILS rates have recovered somewhat. Indeed, in the euro area, the 5y5y ILS rate stood at 1.75% in early July 2018, around 50 basis points higher than its trough in 2016.

Chart 1
5y5y ILS rates



Sources: Bloomberg and ECB calculations.
Notes: The chart shows ILSs that reference the Harmonised Index of Consumer Prices excluding tobacco (HICPxT) for the euro area, the Consumer Price Index for All Urban Consumers (CPI-U) for the United States and the Retail Price Index (RPI) for the United Kingdom. The latest observation is for 31 July 2018.

Consistent with these observations, econometric analysis suggests that global factors have increasingly influenced the euro area 5y5y ILS rate. Chart 1 shows considerable co-movement in the time series of 5y5y ILS rates in the United Kingdom, United States and euro area. To ascertain the significance of this relationship and the extent to which it has evolved over time, we have conducted a forecast error variance decomposition of various ILS rates and other financial variables.[66] We use this vector autoregressive (VAR) model to construct two sets of spillover indices: a) overall spillovers within the VAR model and b) spillovers to longer-term inflation expectations in each jurisdiction. For the latter, the spillover index for the euro area measures how much of the two-week-ahead forecast error variance of the 5y5y ILS rate is explained by the other variables in the VAR model.

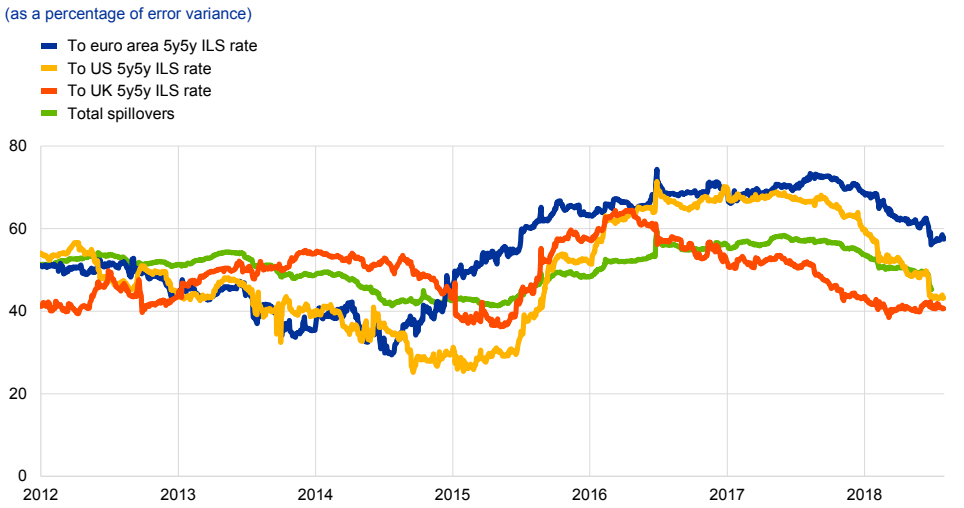
Spillovers to longer-term inflation expectations rose substantially in 2015, possibly reflecting global concerns about weak aggregate demand and associated disinflationary pressures (see Chart 2). The error variance decomposition implies a high degree of spillovers between the 5y5y ILS rates of all three economic areas. In addition, the emergence of a positive wedge between

66 The decomposition is conducted according to the methodology put forward in Diebold, F.X. and Yilmaz, K., "Measuring financial asset return and volatility spillovers, with application to global equity markets", *Economic Journal*, Royal Economic Society, Vol. 119, No 534, pp. 158-171, January 2009. The analysis is based on a VAR model containing a multitude of financial indicators for the euro area, United States and United Kingdom. The VAR model is estimated in levels with five lags, using daily data and a two-year rolling window. The error variance decomposition is a statistical exercise, which means that causality is difficult to ascertain.

spillovers to 5y5y ILS rates and total spillovers (see the green line in Chart 2) suggests that spillovers to longer-term inflation expectations were unusually high from 2015 relative to the other variables in the VAR model. While spillovers from oil prices to 5y5y ILS rates also increased over that period, they were not the main driving factor behind the overall increase in connectedness between 5y5y ILS rates and other variables in the VAR model. Instead, overriding concerns regarding weak global aggregate demand and associated disinflationary pressures are more likely to have been the cause.

Chart 2

Spillovers between longer-term inflation expectations and other financial variables



Sources: Thomson Reuters and ECB calculations.
Notes: Each jurisdiction-specific index represents the contribution of shocks from all other variables in the VAR model to the error variance in the 5y5y ILS rate in each jurisdiction. Total spillovers can be interpreted as the average contribution of shocks from all other variables in the VAR model to the error variance of each variable in the VAR model. Contributions are calculated from the forecast error variance matrix inferred from the generalised identification of shocks. The latest observation is for 31 July 2018.

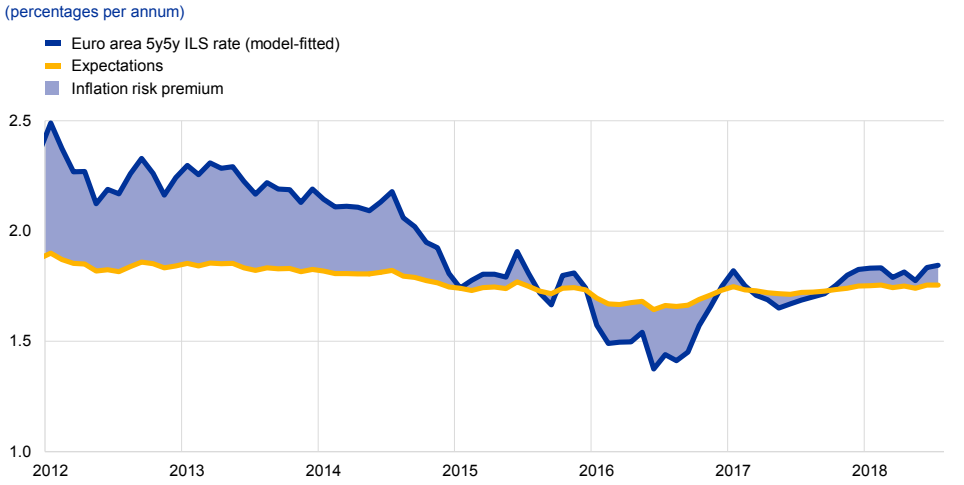
The inflation risk premium entered into negative territory towards the end of 2015, as deflation rather than excessive inflation became the key concern and investor appetite for inflation-linked instruments fell (see Chart 3). To further explore the drivers of the decline in ILS rates, we model the euro area 5y5y inflation risk premium using an affine term structure model.[67] The resulting decomposition of the 5y5y ILS rate into expectations and the inflation risk premium suggests that most of the fall over the period from 2014 to 2016 stemmed from the inflation risk premium component. In late 2015 the inflation risk premium even turned negative, indicating that adverse economic outcomes were associated with the spectre of deflation and, moreover, that investors did not feel the need to protect themselves against inflationary scenarios. Indeed, actual inflation outcomes were persistently below the survey forecasts of most economists during that period. If investors in inflation-linked products also found themselves being continually surprised on the downside, and thus paying more for these products than anticipated, this may also have contributed to the

67 The decomposition is based on an affine term structure model and fitted to the euro area zero-coupon ILS curve. The estimation method follows that described in Joslin, S., Singleton, K. and Zhu, H., "A new perspective on Gaussian dynamic term structure models", *Review of Financial Studies*, Vol. 24, No 3, pp. 926-970, 2011. For further details, see Camba-Mendez, G. and Werner, T., "The inflation risk premium in the post-Lehman period", *Working Paper Series*, No 2033, ECB, March 2017.

lack of appetite for inflation-linked instruments. In turn, this may have led to a downward repricing of inflation risks and a corresponding decline in the perceived value of inflation protection, i.e. the risk premium.[68]

Chart 3

Euro area 5y5y ILS rate, adjusted for inflation risk premia



Sources: ECB and Thomson Reuters.
Note: The decomposition is based on an affine term structure model and fitted to the euro area zero-coupon ILS curve. The estimation method follows Joslin, S., Singleton, K. and Zhu, H. (2011). For details see Camba-Méndez, G. and T. Werner, ECB Working Paper 2033 (2017). The latest observation is for July 2018.

The inflation risk premium fell around the same time as the balance of risks to the inflation outlook shifted downwards, as implied by surveys (see Chart 4). The forecasts in the ECB SPF are for inflation in five years' time. Therefore, for ease of comparison, we take a shorter horizon estimate of the inflation risk premium, namely the one-year ILS rate in four years' time (1y4y). The inflation risk premium fell in tandem with the balance of risks to the inflation outlook, as reflected in the skewness measure derived from the survey data.[69] These developments may have been driven by concerns about weak aggregate demand and associated disinflationary pressures. As Section 3 will discuss, they also coincided with a rise in the probability of deflation, as reflected in the prices of inflation options.

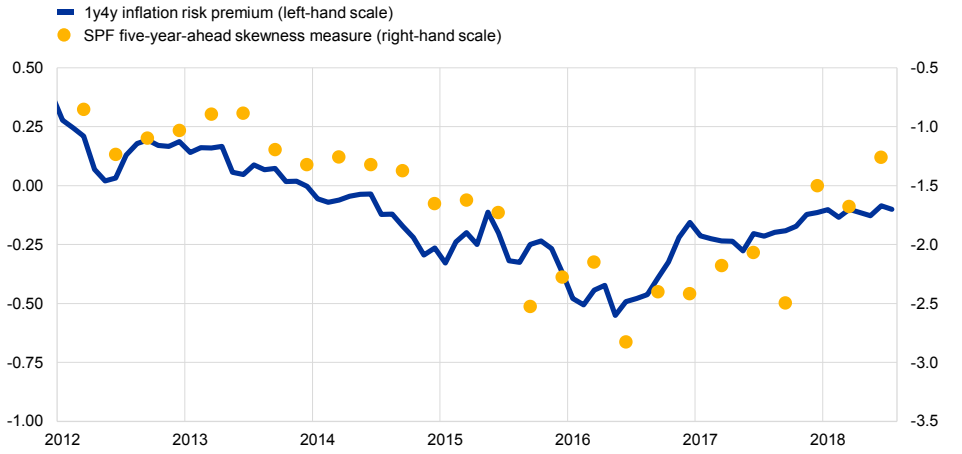
[68] In fact, Section 3 shows that the value of deflation protection increased noticeably in late 2014 and early 2015, before declining more recently.

[69] See the box entitled "How do professional forecasters assess the risks to inflation?", *Economic Bulletin*, Issue 5, ECB, 2017.

Chart 4

Inflation risk premium and survey-derived balance of risks

(left-hand scale: percentages per annum; right-hand scale: number of standard deviations from zero)



Sources: ECB calculations and Thomson Reuters.
Notes: The inflation risk premium is based on the decomposition of an affine term structure model and fitted to the euro area zero-coupon ILS curve. The estimation method follows Joslin, S., Singleton, K. and Zhu, H. (2011). The skewness measure includes the following measures: skewness, quantile skewness, mean-median and mean-point forecast of continuous distributions derived from linear and cubic spline interpolation. The individual series comprising the skewness measure have been standardised by their standard deviation (since 2001) for ease of comparison. A negative (positive) sign means the balance of risks is perceived as being to the downside (upside). The latest observation is for July 2018.

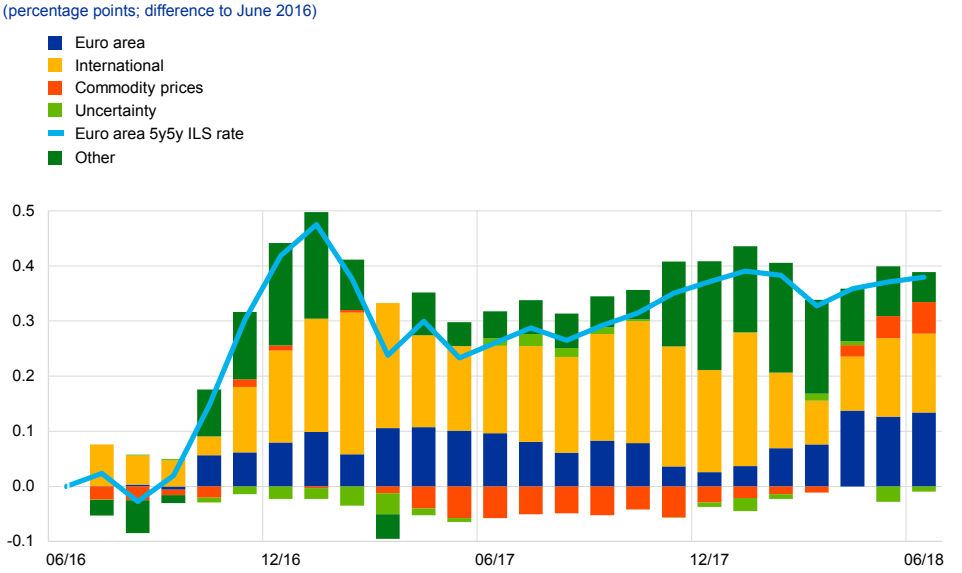
Since mid-2016 measures of longer-term inflation expectations have trended upwards. The euro area 5y5y ILS rate reached a trough in June 2016 (at around 1.20%), shortly after the United Kingdom's referendum on European Union membership and the turbulent market conditions which ensued. Since then, measures of longer-term inflation expectations have trended upwards in the euro area, United States and United Kingdom. Looking again at the term structure model decomposition of euro area 5y5y ILS rates shown in Chart 3, it is evident that throughout this recovery there has been a measurable increase in the inflation risk premium component, albeit from historically low and negative levels. This increase is likely to have reflected a dissipation of perceived downside risks to the inflation outlook amid a broad-based improvement in global economic prospects and an accommodative monetary policy stance. The recovery in inflation across all three jurisdictions suggests that common factors, such as the global economic cycle, have had a strong influence on longer-term inflation expectations. The analysis of spillovers to ILS rates in Chart 2 indicates that, while spillovers have moderated somewhat, ILS rates remain highly connected across jurisdictions.

Model-based analysis corroborates the notion that the recovery of ILS rates has reflected a dissipation of perceived downside risks to the inflation outlook amid a broad-based improvement in global and euro area economic prospects (see Chart 5). To shed further light on the recent recovery in market-based measures of inflation expectations, particularly with a view to understanding the driving forces behind it and more formally disentangling their impact, we have employed a model-based decomposition. The decomposition is based on a four-jurisdiction (United States, United Kingdom, China and the euro area) Bayesian VAR model at monthly frequency, which gauges contributions to fluctuations in variables using a historical shock decomposition. Besides the euro area 5y5y ILS rate, the set of

variables includes real and financial variables, uncertainty indicators and commodity prices. It has been selected on the basis of economic rationale and relevance, as suggested by existing studies and market reports. The decomposition of the cumulative increase in the euro area 5y5y ILS rate since June 2016 (when the 5y5y ILS rate hit a trough) suggests that it was due primarily to a combination of euro area and international factors. This would be consistent with the dissipation of perceived downside risks to the inflation outlook amid a broad-based improvement in global economic prospects. Since then the euro area 5y5y ILS rate has gained further momentum owing to improvements in the euro area growth outlook. Commodity prices have played a limited role over the entire time horizon, but over the course of 2018 they have had a positive impact on the euro area 5y5y ILS rate.

Chart 5

Macroeconomic drivers of euro area 5y5y ILS rates



Sources: Bloomberg, Thomson Reuters and ECB calculations.
Notes: The chart shows a historical shock decomposition from a large Bayesian VAR model, with estimates starting in 2005 at a monthly frequency. Endogenous variables include: US Purchasing Managers' Index (PMI), euro area (EA) PMI, UK PMI, US Producer Price Index (PPI), Chinese PPI, EA PPI, EA unemployment, EA Consumer Price Index (core), oil prices, metals prices (in EUR), S&P500, EuroStoxx, EA two-year risk-free rate, EA ten-year risk-free rate, VIX, Italian-German ten-year sovereign yield spread, EUR NEER-38, EA 5y5y ILS rate. Exogenous variables include: outstanding amount of EA sovereign inflation-linked bonds. Shocks are identified using a Cholesky ordering. The chart includes cumulative changes since June 2016. The latest observation is for June 2018.

3 The distribution of market-based inflation expectations

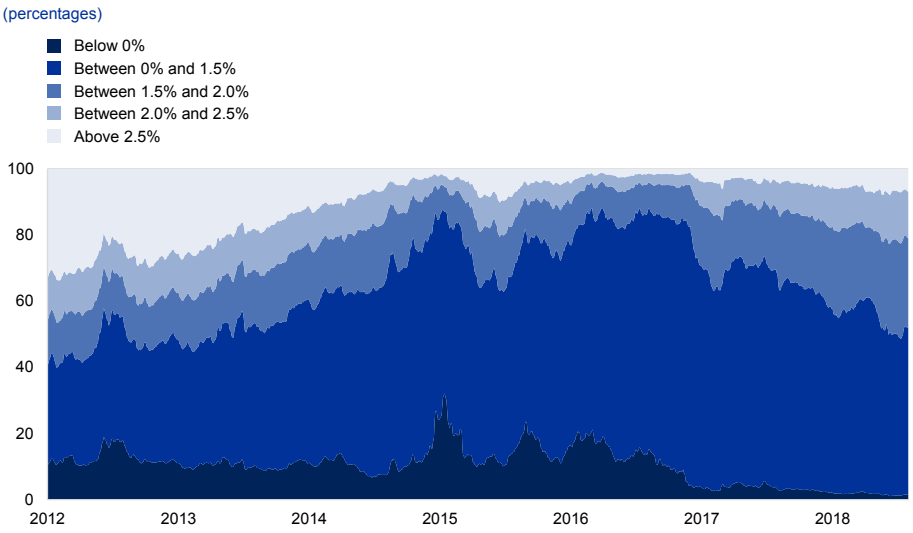
Analysing the prices of euro area inflation options provides timely insights into the distribution of market participants' inflation expectations over and above the central tendency reflected in swap rates. Inflation options differ from ILSs in that they are instruments with "non-linear" pay-offs. In the case of euro area inflation options, this means that either (i) they pay out if inflation as measured by the euro area HICPxT exceeds a certain threshold, and zero otherwise (inflation caps) or (ii) they pay out if inflation falls short of a certain threshold, and zero otherwise (inflation floors). Inflation options thus effectively offer insurance against a certain inflation event and, all else equal, investors' willingness to pay for such insurance will depend on the

probability of the given event. By comparing the prices of options that insure against different outcomes, it is possible to infer the probability that investors assign to those different outcomes – in other words, the probability distribution of market participants' inflation expectations.

Developments in option-implied probabilities for a range of inflation events show that the distribution of inflation expectations has changed considerably in recent years (see Chart 6). The chart tracks the so-called risk-neutral probability of various relevant inflation outcomes, as implied by "zero-coupon" options whose pay-offs depend on average euro area inflation over a five-year period (see Box 1 for a discussion of the appropriate interpretation of risk-neutral probabilities).[70] As such, the probabilities essentially reflect *spot* inflation expectations over the next five years *starting today* and hence cannot be compared one for one with, for example, the aforementioned 5y5y ILS rate, which is a five-year *forward* rate *starting in five years*. The evolution of the implied distribution is nonetheless useful as five years is a sufficiently long period to cover not only market participants' expectations regarding near-term developments of euro area inflation, but crucially also the medium-term inflation outlook.

Chart 6

Option-implied risk-neutral distribution of euro area average inflation over the next five years



Sources: Bloomberg, Thomson Reuters and ECB calculations.
Notes: Probabilities implied by five-year zero-coupon inflation options, smoothed over five business days. Risk-neutral probabilities may differ significantly from physical, or true, probabilities. The latest observation is for 31 July 2018.

In particular, the option-implied distributions shifted towards concerns about deflation in late 2014 and early 2015, which then steadily receded following the introduction of the APP. Chart 6 shows that the risk-neutral probability of deflation had started to increase noticeably towards the end of 2014, before peaking significantly above previously recorded levels in January 2015 when the APP was

[70] The extraction of risk-neutral probabilities is based on Breeden, D. and Litzenberger, R., "Prices of State-Contingent Claims Implicit in Option Prices", *Journal of Business*, Vol. 51, No 4, pp. 621-651, 1978. Option prices are translated into implied volatilities using the Black-Scholes formula, and implied volatilities are interpolated following Shimko, D., "Bounds of Probability", *RISK*, No 6, pp. 33-37, 1993.

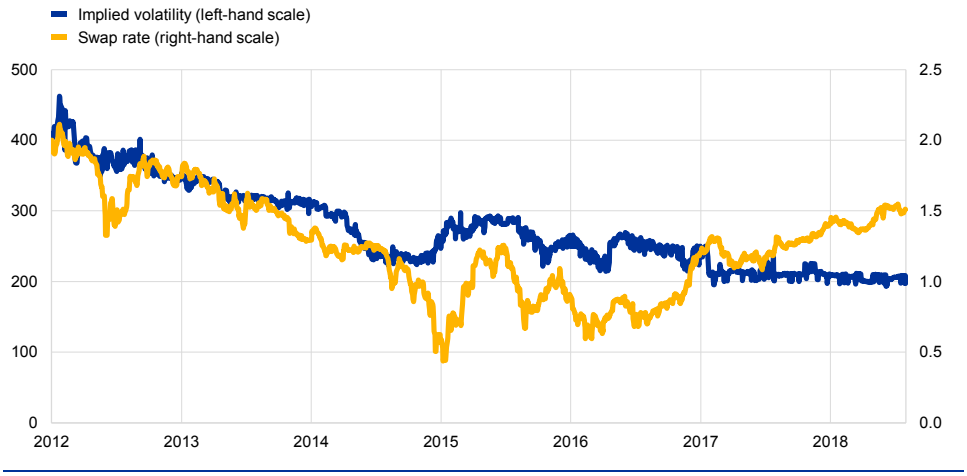
announced. At that point in time, the balance of probabilities around investors' inflation outlook for the euro area was heavily tilted towards deflationary and low, but positive, outcomes (i.e., between 0% and 1.5%) – a clear shift from three years earlier when the option-implied distribution revealed market participants were assigning a far greater probability to high inflation outcomes (i.e., above 2.5%). Following the announcement of the APP, the risk of deflation as implied by euro area inflation option prices declined markedly, albeit remaining somewhat elevated for some time thereafter. However, as the APP continued and the general inflation outlook improved, the spectre of deflation in the euro area gradually vanished and is now seen as negligible by market participants.

The information contained in the prices of euro area inflation options also suggests that investors have started to price in gradually decreasing levels of inflation uncertainty. This trend is not only evident from Chart 6, which illustrates that the aforementioned steady decline in the option-implied risk of deflation has not been accompanied by a concomitant increase in the likelihood of high inflation outcomes, and that the option-implied probability currently assigned to high inflation and deflation outcomes combined is noticeably below the level prevailing towards the beginning of the period under review. It is also evident from Chart 7, which shows the evolution of inflation uncertainty as measured by the option-implied volatility – a gauge of the spread of the distribution (see the blue line) – next to developments in the five-year swap rate – a gauge of the central tendency of the distribution (see the yellow line).[71] Clearly, the downward trend in option-implied volatilities throughout the period from 2012 to 2014 that went hand in hand with declines in the swap rate was subsequently not reversed. In fact, despite the noticeable recovery in the swap rate since the second half of 2016, implied volatilities have remained at very low levels and, if anything, declined even further. This suggests that investors' uncertainty regarding euro area inflation and the risk premia they are demanding continue to be relatively low, also given the substantial improvement in the inflation outlook (see also Chart 3).

[71] Implied volatility is an important concept in option pricing. It denotes the level of volatility in the option's underlying asset over the life of the option contract that, given an option pricing model, is consistent with the current market price of the option. Intuitively, higher prices for options that insure against a certain event are associated with higher probabilities of that event occurring in the future. In turn, all else equal, higher probabilities require higher levels of future volatility in the underlying. Implied volatilities can therefore be extracted from prices based on a given option pricing model. For example, if investors become more uncertain about the inflation outlook, i.e. they assume a higher volatility going forward, the prices of inflation options will increase. It is important to note the forward-looking and subjective nature of implied volatility, which sets it apart from the concept of historical, or realised, volatility.

Chart 7

Inflation uncertainty as implied by euro area inflation options



Sources: Bloomberg, Thomson Reuters and ECB calculations.
Notes: "Implied volatility" refers to the average of implied volatilities across five-year zero-coupon inflation options with different strike rates (both "cap" and "floor" options). "Swap rate" refers to five-year euro area HICPxT-linked swaps. The latest observation is for 31 July 2018.

Box 1

Interpreting option-implied probabilities

Prepared by Benjamin Böninghausen, Gregory Kidd and Rupert de Vincent-Humphreys

It is important to stress that option-implied "risk-neutral" probabilities, while containing valuable information, must not be interpreted as being identical to the underlying "physical" probabilities of inflation events. Practically speaking, this means that an option-implied probability of, for example, 25% for deflation does not imply that investors believe there is a one-in-four chance that deflation will actually emerge. This is somewhat counterintuitive, but as this box explains, it is due to the presence of risk premia in financial markets.

Option-implied "risk-neutral" probabilities are obtained under standard no-arbitrage considerations without making assumptions about investors' risk preferences. The option-implied distributions of euro area inflation expectations presented in this article build on, among other things, the well-known Black-Scholes option pricing model. That model postulates that investors cannot earn a risk-free profit by buying (or selling) an option and simultaneously selling (or buying) a portfolio of other assets that exactly replicates the future pay-off from the option. This notion of "no arbitrage" is central to asset pricing theory and gives rise to probabilities under a risk-neutral probability measure, typically denoted by Q. More formally, and to put it simply, the price of an inflation-linked asset today (p_t) depends on the risk-neutral probabilities $P^Q(\pi)$ and expected one-period-ahead pay-offs $E_t\left(x_{t+1}(\pi)\right)$ associated with different inflation events $\pi \in \Pi$, as well as the risk-free rate r_f:

$$p_t = \sum_{\pi \in \Pi} \frac{1}{1+r_f} P^Q(\pi)\, E_t\left(x_{t+1}(\pi)\right) \qquad (1)$$

The price of the asset under the no-arbitrage condition is thus a probability-weighted sum of expected future pay-offs discounted at the risk-free rate. Letting p_t equal the current market price, it is possible

to determine the risk-neutral probabilities $P^Q(\pi)$ based on the expected pay-offs $E_t(x_{t+1}(\pi))$ and the known risk-free rate r_f.

However, as real-world investors tend to be risk-averse, the extracted risk-neutral probabilities reflect risk preferences as much as they reflect the underlying physical probabilities of different outcomes. Risk-averse investors are willing to pay a premium to insure against the disutility associated with particularly adverse outcomes. For instance, in the context of inflation, this can mean that investors value more highly the pay-offs from options that pay out in the case of tail events such as deflation or (very) high inflation than those that pay out in the case of low, but positive, inflation. The actual price of inflation options therefore reflects the discounted sum of the values that investors assign to future pay-offs in different states of the world $\pi \in \Pi$, with those states weighted by the actual, or physical, probabilities $\mathrm{P}(\pi)$ under the P measure.

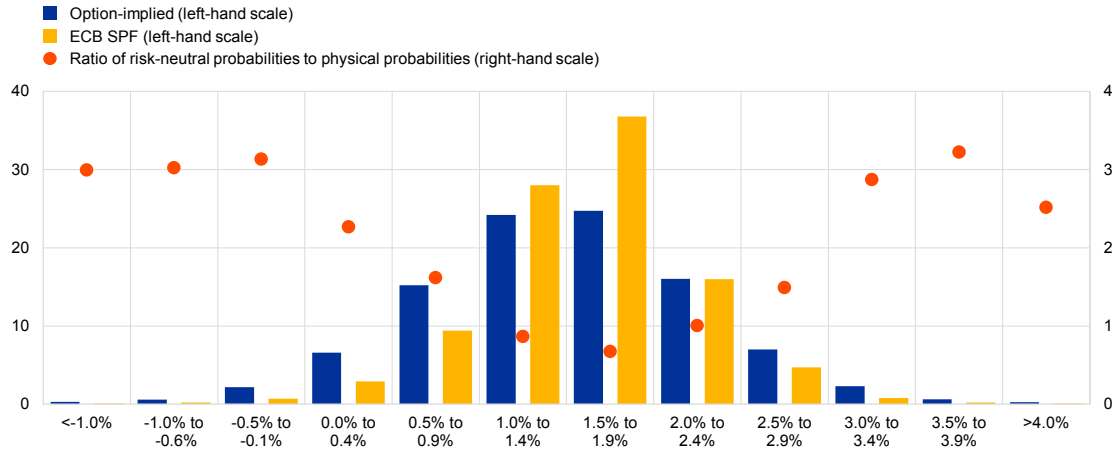
As a result, risk-neutral probabilities tend to overstate the corresponding physical probabilities for tail events and vice versa for non-tail events. To see this, note that extracting $P^Q(\pi)$ based on equation (1) is conditional on the expected future pay-offs $E_t(x_{t+1}(\pi))$ across inflation events $\pi \in \Pi$, rather than on how much value investors actually assign to them. Hence, $E_t(x_{t+1}(\pi))$ will generally represent a relative underestimation of these values in the case of tail events and a relative overestimation in the case of non-tail events. Clearly, for a given market price p_t, this needs to be compensated by extracted risk-neutral probabilities $P^Q(\pi)$ that are higher than the true, physical probabilities $\mathrm{P}(\pi)$ in the case of tail events, but lower in the case of non-tail events.

The impact of risk premia on the level of option-implied risk-neutral probabilities for euro area inflation can also be illustrated by comparing them with the results reported in the ECB Survey of Professional Forecasters (SPF). The SPF lends itself to this purpose as it asks survey participants not only for their expectations regarding euro area inflation over different time horizons, but also for the probabilities they assign to different outcomes across the entire inflation spectrum for those same horizons. These probabilities can be interpreted as true, physical probabilities that are unaffected by risk premia and therefore provide a natural reference point for assessing the degree to which market participants price risk premia into inflation options.

Chart A

Option-implied risk-neutral probabilities versus physical probabilities from the ECB SPF

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



Sources: Bloomberg, Thomson Reuters and ECB calculations.
Notes: "Option-implied" refers to the risk-neutral probability of a given inflation outcome, as extracted from the prices of one-year zero-coupon options based on the (three-month lagged) euro area Harmonised Index of Consumer Prices excluding tobacco (HICPxT) inflation. "ECB SPF" refers to the physical probability for euro area HICP inflation over the next year, as implied by the responses of professional forecasters surveyed by the ECB (based on the results for the first quarter of 2018). For ease of comparison, risk-neutral probabilities are evaluated at the date of the deadline for SPF participants to respond (11 January 2018). The "Ratio of risk-neutral probabilities to physical probabilities" is calculated by dividing the option-implied probabilities by the SPF-implied probabilities.

Chart A shows that the option-implied probabilities indeed tend to be larger than the survey-implied physical probabilities in the tails of the distribution, which is consistent with the notion that investors require risk premia for the associated inflation events. The chart compares the results for one-year-ahead euro area inflation, which is the horizon that allows for the closest matching given the availability of euro area inflation options and the horizons considered in the SPF. The option-implied probabilities (see the blue bars) clearly exceed the survey-implied probabilities (see the yellow bars) for those scenarios in which inflation is either negative or above 3%. In each case, risk-neutral probabilities are roughly three times higher than the physical probabilities (see the red markers). By contrast, physical probabilities tend to be higher than their risk-neutral counterparts for the low, but positive, inflation outcomes in between the aforementioned tail events. These observations are consistent with risk-averse investors valuing the pay-off from inflation options more highly in deflation and high inflation regimes, resulting in a larger wedge between the associated risk-neutral and physical probabilities.[72]

Although option-implied probabilities need to be interpreted bearing in mind the above considerations, tracking their evolution over time does convey important information on changes in investors' assessment of the euro area inflation outlook. The reason is that changes in risk-neutral probabilities and their physical counterparts will broadly be in line with each other, unless there is a negative correlation between the true, physical probabilities and risk premia. However, this latter scenario would mean that, in the case of deflation for example, an investor would need to systematically revise downwards the risk premium for deflation whenever the odds of this event materialising are seen as increasing. This seems quite implausible – in fact, physical probabilities and risk premia would generally be expected to move together over time (to varying degrees). Tracking the evolution of option-implied probabilities therefore provides useful and timely signals regarding shifts in investors' underlying inflation outlook.

4 Conclusions

Market-based indicators of euro area inflation expectations have recently recovered on the back of a significant improvement in the domestic macroeconomic outlook, following a marked decline between 2014 and mid-2016. The review of developments in longer-term market-based indicators of inflation expectations in this article suggests that this decline correlated with similar trends in other major jurisdictions. Further analysis indicates that, in addition to domestic factors, global concerns about sluggish aggregate demand and related disinflationary pressures played their part in the fall in market-based measures of euro area inflation expectations. The subsequent recovery appears to have been driven by a partial dissipation of these concerns and, in particular, a substantial improvement in

[72] It is important to note that probabilities reported in surveys rely on subjective distributions. However, there is evidence that experts tend to be overly confident in the accuracy of their assessment of the future – in other words, they may assign too small a probability to tail events. Some of the wedge between the survey-implied probabilities for tail events and their option-implied risk-neutral counterparts may therefore also be attributable to this "overconfidence effect".

the macroeconomic picture for the euro area, notably also as a reflection of the ECB's accommodative monetary policy.

The recent developments in longer-term market-based indicators have been due primarily to the inflation risk premium, which changed in line with the shifts in the balance of risks to the inflation outlook. A decomposition of the movements in market-based indicators shows that both the pure expectations component and the inflation risk premium component contributed to the initial decline and subsequent recovery. However, most of the fall between 2014 and mid-2016 is estimated to have stemmed from the risk premium component, which fell around the same time as the downward shift in the balance of risks implied by the skewness of the probability distributions reported in the SPF. Taken together, these two factors indicate that investors felt little need to hedge against inflationary scenarios at the trough of mid-2016, but were instead concerned about deflationary outcomes.

Market-based indicators also suggest that the spectre of deflation in the euro area has steadily receded following the ECB's launch of the APP and is now regarded as negligible by investors. This article has used the prices of inflation options that insure against different inflation outcomes to extract market-implied probability distributions for the euro area inflation outlook. The implied probability of deflation peaked markedly above previously recorded levels in January 2015, when the ECB announced its APP. At that time, the balance of probabilities around investors' inflation outlook was tilted heavily towards deflationary and low, but positive, inflation outcomes. However, as the APP continued and the general economic and inflation outlook in the euro area improved, the spectre of deflation in the euro area gradually vanished.

3 Trends and developments in the use of euro cash over the past ten years

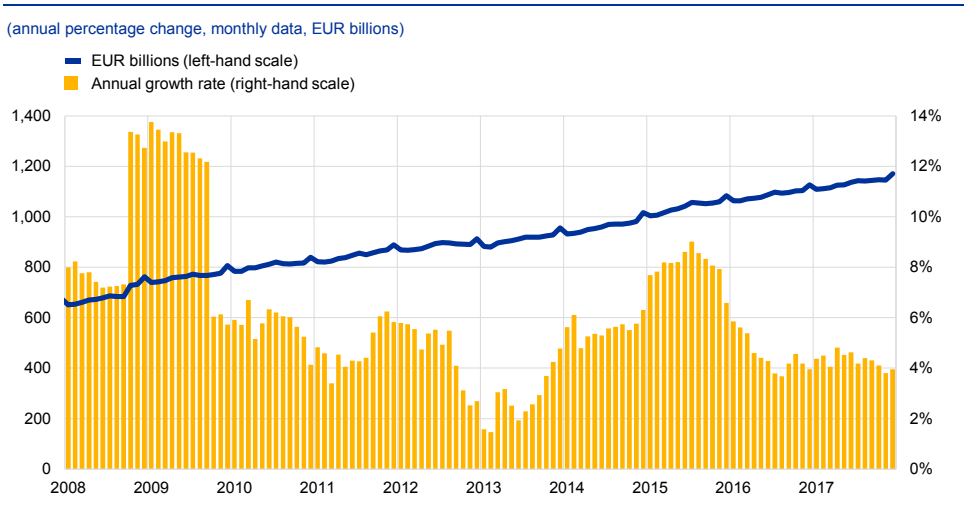
Prepared by Laure Lalouette and Henk Esselink

1 Developments in the circulation of euro banknotes

1.1 Overall developments in circulation

The value of euro banknotes in circulation grew continuously during the period from January 2008 to December 2017, with an average annual growth rate of 6.1%. At the end of 2017, the total value of euro banknotes in circulation was €1,171 billion, with an annual growth rate of 4.0%. Seasonal patterns in circulation can be observed especially during summer holidays and the Christmas period (see Chart 1). The ratio of banknotes in circulation to nominal gross domestic product (GDP) has increased from 7.9% to 10.5% over the past ten years, indicating that, while in line with the GDP growth trend (see Chart 2), the value of euro banknotes in circulation has been growing faster than the overall economy and that other factors have therefore been contributing to this increase. Some of these factors are described in more detail in the present article.

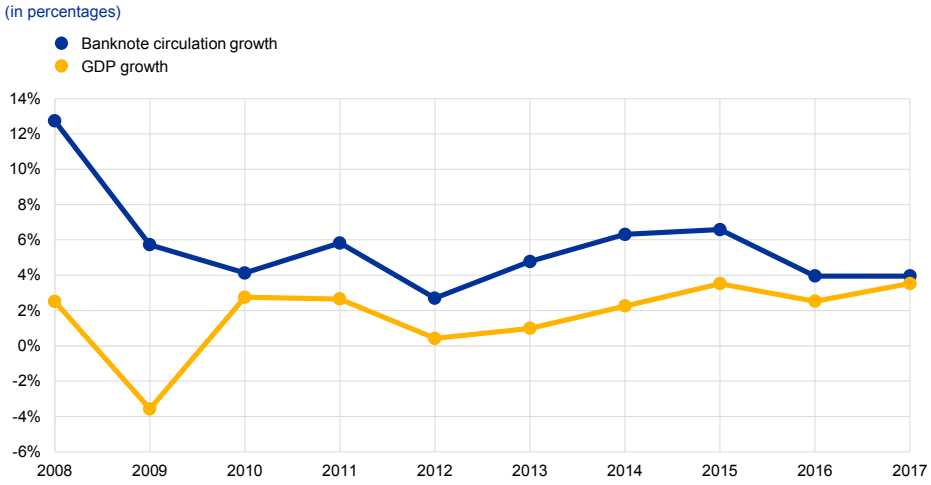
Chart 1
Euro banknote circulation



Source: ECB Currency Information System.
Note: The latest observations are for 31 December 2017.

Chart 2

Euro banknote circulation and GDP



Sources: ECB Currency Information System and Statistical Data Warehouse.
Notes: Annual growth rates calculated at the end of the year. Nominal GDP at market prices.

During the period under review, the euro was successively adopted by Cyprus and Malta (2008), Slovakia (2009), Estonia (2011), Latvia (2014) and Lithuania (2015). The effects of the euro's introduction in these countries on the total number and value of euro banknotes in circulation has, however, been very limited. Two months after their respective introductions of the euro, these countries' contributions to the total value of euro banknotes in circulation ranged between 0.03% and 0.35%.

Apart from the introduction of the euro in the aforementioned six Member States, euro banknote circulation over the period from 2008 until the end of 2017 was characterised by four main events.

The Lehman Brothers crisis – Between January and September 2008 the average annual growth rate of the value in circulation was 7.6%. Following the bankruptcy of Lehman Brothers on 15 September 2008 the net issuance of euro banknotes increased by €43.7 billion in October, of which net shipments of euro banknotes to regions outside the euro area amounted to €13.7 billion, the highest value since the introduction of the euro. From October 2008 until the end of September 2009, the value of banknotes in circulation continued to rise, with an average annual growth rate of 13.0%. Over this period the value in circulation increased by €83.3 billion, as compared to only €46.6 billion for the period from October 2007 to the end of September 2008. From this it can be inferred that the additional growth of the value in circulation due to the crisis amounted to around €37 billion. The €50, €100 and €500 denominations, which accounted for 18.4%, 17.5% and 56.9% of the additional increase, respectively, provided the greatest contribution.

The sovereign debt crisis – Autumn 2009 marked the beginning of the European sovereign debt crisis, whose effects on banknote demand lasted until the end of 2013. In an environment of uncertainty on the financial markets, lack of trust in government debt and low GDP growth in the euro area, demand for euro banknotes decelerated and the annual growth rate of the value in circulation reached its all-time low of 1.5%.

Nevertheless, for the entire period from October 2009 to the end of 2013, the annual increase in the value in circulation was still relatively strong, averaging 4.6%.

The economic recovery in the euro area – Together with low interest rates (see Box 3), this resulted in an acceleration in banknote circulation growth from the beginning of 2014. In December 2014, the depreciation of the Russian rouble against the euro led to a remarkable increase in purchases of euro banknotes from regions outside the euro area, primarily Russia. Net shipments in December 2014 amounted to €6.5 billion, marking the highest monthly volume observed since the 2008-2009 financial crisis. The average annual growth rate during the period from January 2014 to January 2016 was 6.8%.

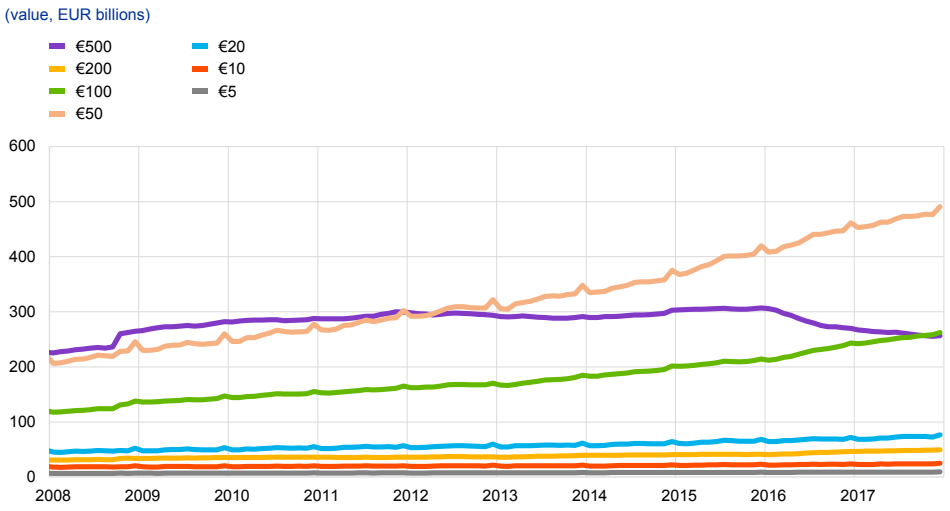
The Governing Council decision on the €500 – On 4 May 2016 the Governing Council decided to discontinue production of the €500 banknote with immediate effect and to stop its issuance around the end of 2018. The circulation of €500 banknotes has continuously declined since the first discussions on the topic were reported in the media in February 2016, although this decline has levelled off since April 2017. At the end of 2017 the value of €500 banknotes in circulation amounted to €256.8 billion, compared to €306.8 billion at the end of 2015. At the same time, the demand for €200, €100 and €50 denominations increased more than in previous years. This increase to a large extent offset the decline in €500 circulation. On average, from February 2016 to December 2017 annual circulation growth was 4.4%.

1.2 Denominational structure of the banknote

The €50 is by far the most circulated banknote. The €500 was the denomination with the highest share of banknotes in circulation in terms of value until April 2012, after which point the €50 became the most important denomination. At the end of 2017, the €50 accounted for 42% of the total value in circulation (see Charts 3 and 4). The popularity of the €50 can be attributed to the fact that this denomination is used both for transaction purposes and as a store of value. As a consequence of the Governing Council decision to stop issuing the €500, the increase in the total value of €50 and €100 banknotes in circulation accelerated further from February 2016. In October 2017, the €100 overtook the €500 as the second most important denomination in circulation in terms of value. The total value of €200 banknotes in circulation showed only slightly higher growth after the €500 decision. The combined share of the three highest euro denominations at the end of 2017 amounted to 48.5%. In comparison, the $100 banknote had a share of 79.7% of the total value of US dollar banknotes in circulation at that time. By contrast, since January 2008 the three lowest denominations (€5, €10 and €20), which are mainly used for transaction purposes, have had relatively steady shares of the value in circulation, totalling 10.5% at the end of 2008 and 9.5% at the end of 2017.

Chart 3

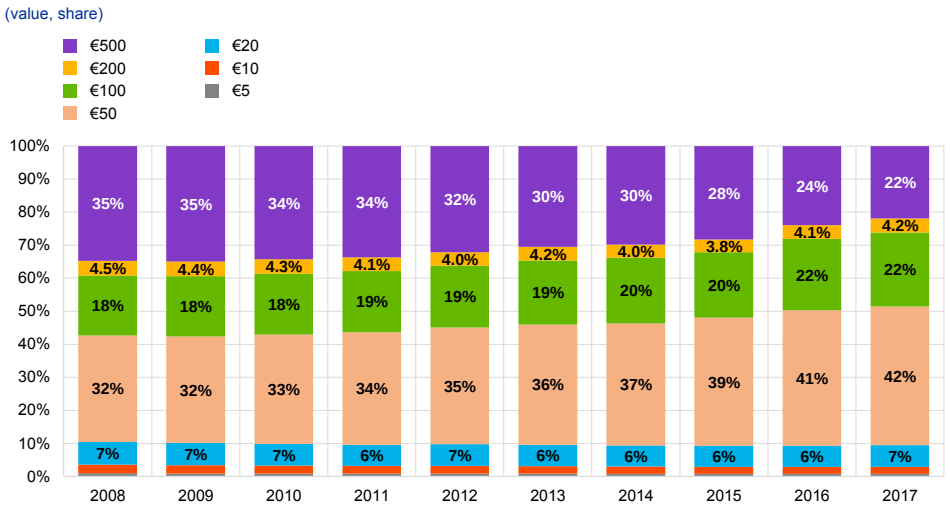
Euro banknotes in circulation by denomination



Source: ECB Currency Information System.
Note: The latest observations are for 31 December 2017.

Chart 4

Share by denomination of euro banknotes in circulation



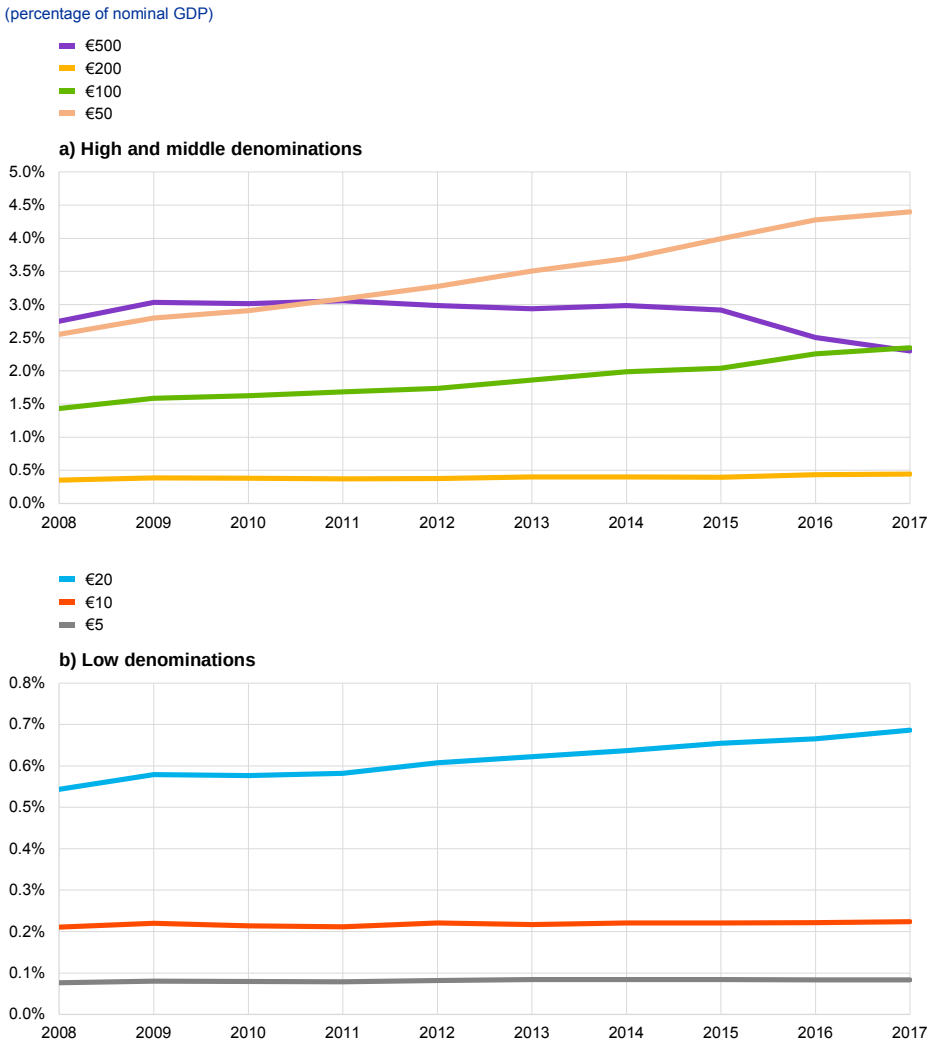
Source: ECB Currency Information System.
Note: The latest observations are for 31 December 2017.

Looking at the contribution of each denomination to the share of the banknote value in circulation as a percentage of GDP (see Chart 5), it is clear that the €50 and €100 banknotes in particular contributed to the increase in the cash to GDP ratio. The ratio of €500 banknotes to GDP increased to 3% during the first year after the Lehman Brother crisis, after which it began to decline. This trend accelerated with the announcement of the decision to stop issuing the €500 banknote, with the ratio reaching 2.3% at the end of 2017. By contrast, the ratio of €200 banknotes to GDP has seen only a very marginal increase over the past ten years and the ratios of €5 and €10 banknotes to GDP have remained stable, confirming that these banknotes are typically used for transaction purposes. Surprisingly, the ratio of €20 banknotes to

GDP increased faster than the size of the euro area economy, indicating that factors other than the increase in the number of transactions have also contributed to the demand for this denomination. Chart 5(a) shows the development of the ratios for the high and middle denominations, i.e. €50 to €500, and Chart 5(b) for the three low denominations, i.e. €5, €10 and €20.

Chart 5

Ratio of banknotes in circulation to nominal GDP



Sources: ECB Currency Information System and Statistical Data Warehouse.
Note: Nominal GDP at market prices.

2 The different drivers of euro banknote circulation

2.1 The use of cash for domestic transactions

Euro banknotes are used as payment instruments by 340 million European citizens for their daily private or professional transactions. The determinants of cash held and used for private transactions at points-of-sale (POS) were described in detail in a recent ECB study.[73] Cash is also held by merchants and in vending, ticketing and gaming machines as well as stored by monetary financial institutions (MFIs) for distribution via bank counters or ATMs (see Box 3).

Box 1

The use of cash at POS, insights from a survey

Prepared by Elisabetta Maria Saini and Henk Esselink

Additional insights from the survey on the use of cash by households in the euro area

The ECB Occasional Paper "The use of cash by households in the euro area" revealed that, across the euro area in 2016, an average of 79% of all POS transactions were carried out using cash. In terms of the value of transactions, cash accounted for a share of 54%.[74] The average value of a transaction made using any means of payment was €18.10. The average value of a cash transaction was €12.38. Indeed, as already shown in the study, approximately two-thirds of all payments were for less than €15, of which 88% were made in cash. In other words, cash is generally used for small-value transactions. At the same time, only 8% of all POS transactions involved amounts of €50 or more and only 2% of the number of all POS transactions involved amounts of €100 or more. When looking at the value of transactions, however, the picture is different. In value terms, in 2016 only 20% of all POS transactions involved amounts less than €15, and those involving amounts of €50 or more represented 43% of the total value of POS transactions, as shown in Chart A.

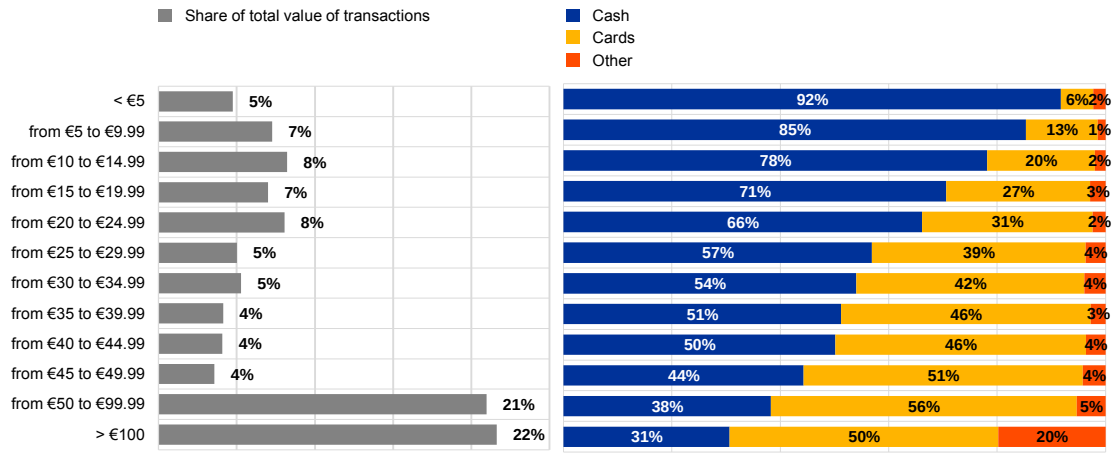
[73] See Esselink, H. and Hernandez, L., "The use of cash by households in the euro area", *Occasional Paper Series,* No 201, ECB, Frankfurt am Main, November 2017.

[74] The study was based on a payment diary survey in 17 euro area countries. The results of separate surveys in Germany and the Netherlands, carried out in 2014 and 2016, respectively, were integrated to show the share of cash in POS transactions across the entire euro area. In February 2018 the Deutsche Bundesbank published the results of a payment diary study entitled "Payment behaviour in Germany in 2017 – Fourth study of the utilisation of cash and cashless payment instruments". The results showed a decrease in the share of cash payments in Germany by 5 percentage points in number and 6 percentage points in value compared with the 2014 survey, suggesting that the euro area results on cash use would have been slightly lower if German results for 2016 had been available for the euro area study.

Chart A

Use of payment instruments at POS, by value range

(value of transactions, shares)



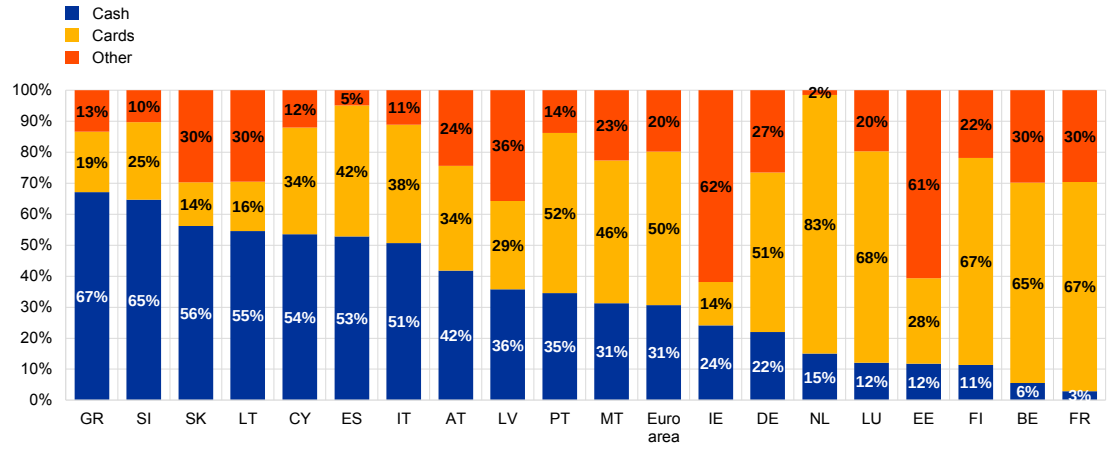
Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.
Note: This survey was conducted in 2016.

Higher-value transactions are mainly carried out using payment cards, but more than one-third of POS transactions involving amounts greater than €100 are still made in cash. Nevertheless, in line with the other findings of the study, there are large differences across the euro area in the use of cash for payments, including for amounts greater than €100. Chart B shows that in seven euro area countries more than 50% of POS payments, in terms of value, were in cash, while in other countries such as France and Belgium the share of high-value transactions using cash was relatively minor.

Chart B

Transaction values by instrument and country for POS transaction amounts greater than €100

(percentage of total POS transactions > €100; value of transactions)



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.
Note: This survey was conducted in 2016.

Chart A shows that the larger the amount the consumers have to pay, the less likely it is that they will pay with cash. However, not all consumers behave similarly in terms of the thresholds at which they pay with cash, cards or other means: only 49% of the respondents in the 17 euro area

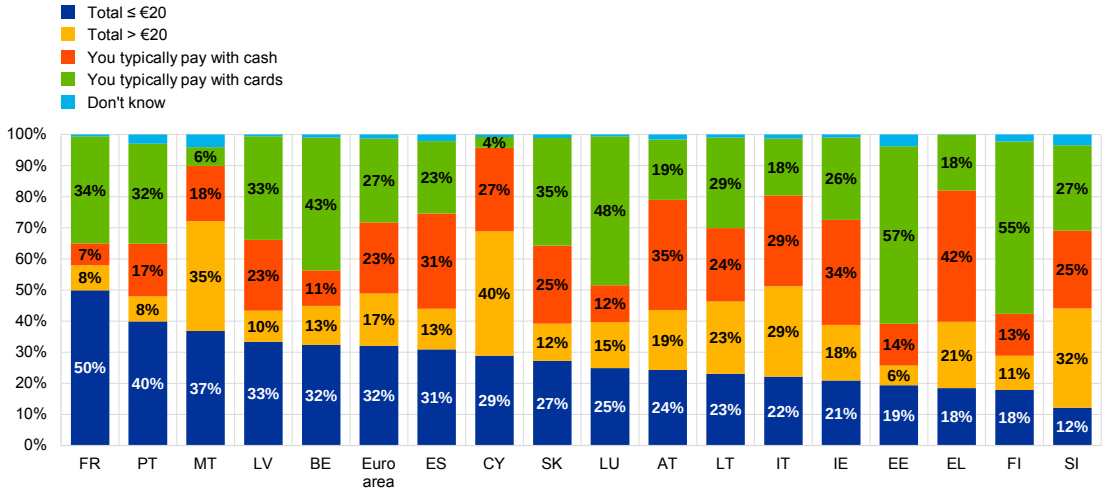
countries in which the question was asked responded that their choice of payment instrument depended on the amount to be paid, with roughly one-third of respondents stating that they typically paid amounts less than €20 using cash (see Chart C). In contrast, 50% of respondents said that their payment behaviour is not normally dependent on the amount to be paid, 23% reported that they always paid with cash, and 27% normally always paid with cards. The results by country are in line with expectations based on other results of the survey. More than 50% of the respondents in Estonia and in Finland stated that they typically used cards, irrespective of the amount, while in Cyprus, Malta, Greece, Italy and Austria, less than 20% of respondents typically did so.

Chart C

Threshold amount below which cash is preferred

Question: When shopping in shops, what is the amount below which you would typically pay with cash instead of other payment methods?

(percentages; based on 20,772 respondents from the euro area)



Source: ECB.
Note: Results not comparable for the Netherlands and not available for Germany. This survey was conducted in 2016.

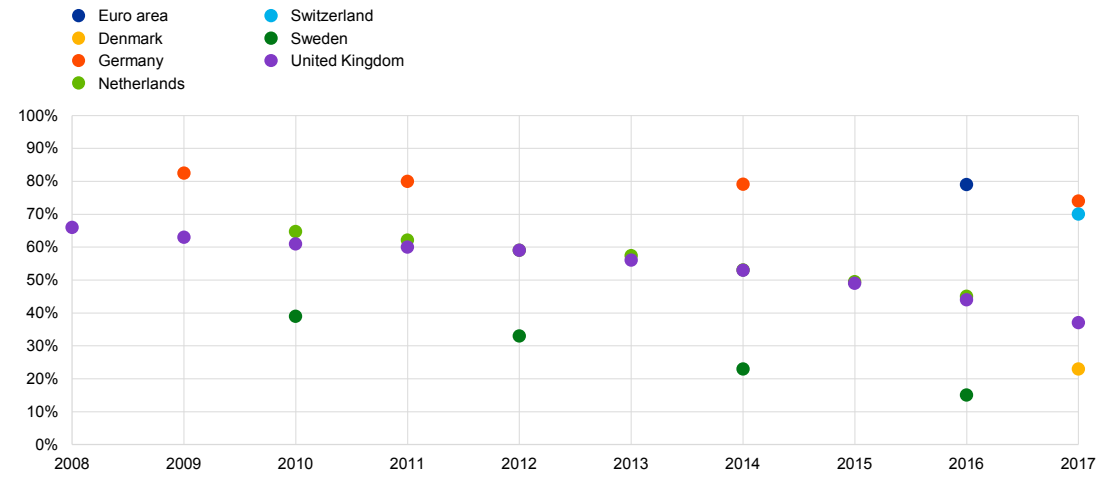
The future of cash used for transaction purposes

The results of recent payment behaviour surveys are presented in Chart D. Consumer payment behaviour in the countries in question is heterogeneous, with Germany and Switzerland being primarily cash-based countries and Sweden almost a cashless society. Cash usage in the euro area as a whole is comparable to that in Germany. Interestingly, the United Kingdom and the Netherlands have followed almost the exact same pattern of declining cash usage. All of the countries that have conducted surveys over time have found that the use of cash as a percentage of total transactions has fallen, albeit at different rates, and while its speed cannot be predicted, a similar decline in the use of cash can be expected for the euro area as a whole as well.

Chart D

Cash transactions as a percentage of POS transactions or all transactions

(percentages, number of transactions)



Sources: ECB, Danmarks Nationalbank, Deutsche Bundesbank, De Nederlandsche Bank, UK Finance (UK Payment Markets Summary 2018), Swiss National Bank and Sveriges Riksbank.
Notes: The surveys are based on different scopes (e.g. focus on POS transactions or all transactions) and methodologies. The data for Sweden are taken from the Swedish survey question: How did you pay the last time you paid for something?

The introduction of the second series of euro banknotes (i.e. the Europa series) provides a unique opportunity to estimate the percentage of banknotes in circulation used for domestic transaction purposes. The €5 to €50 denominations of the Europa series have been introduced successively since 2013.[75] The pace of the replacement of first series banknotes in circulation by second series banknotes within a defined period of time may provide an indication of the percentage of banknotes in circulation used for payment transactions.[76] First series banknotes returning from circulation after this defined period may indicate that they were used as a store of value or held abroad. However, estimates based on this method have several limitations. First, both series were issued in different ways across denominations and countries. For example, each country had a different period during which first series banknotes of a certain denomination were still issued by the central bank following the introduction of the new series. Second, although the ECB has stated that the first series banknotes will retain their status as legal tender, the announcement of the launch of the second series may have, to a certain extent, triggered the use of first series banknotes which would otherwise have been kept as a store of value. Third, the minimum period after which a returned banknote can be considered to have been used as a store of value cannot be accurately determined.

Charts 6(a) to (d) show that after 12 months the percentages of second series banknotes out of the total in circulation were 57% for the €5 and the €20, 67% for the €10 and 31% for the €50. Assuming that these saturation rates represent the active part of the €5 to €50 banknotes in circulation, it can be estimated that the value

75 Launch dates of the second series: €5 on 2 May 2013, €10 on 23 September 2014, €20 on 25 November 2015 and €50 on 4 April 2017.

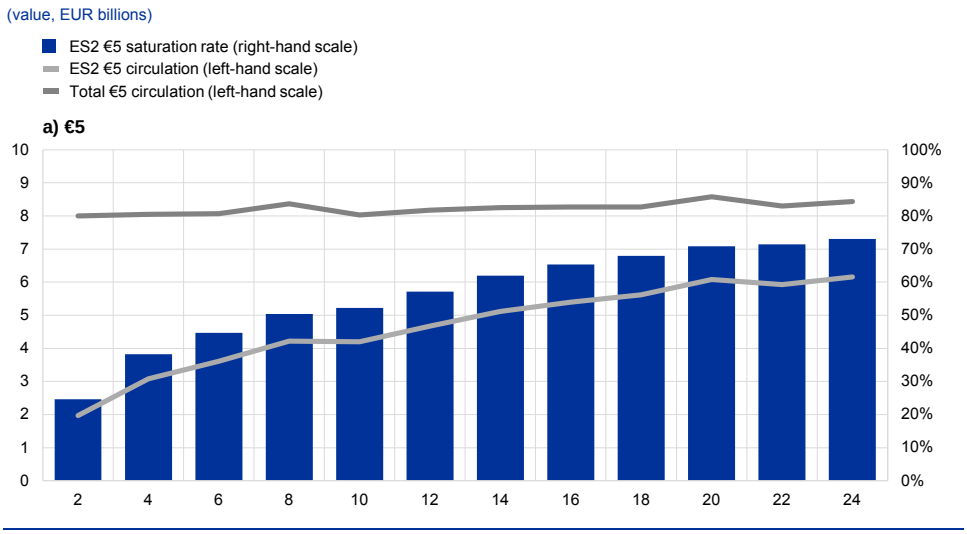
76 See also "The demand for euro banknotes at the Bundesbank", *Monthly Report*, Deutsche Bundesbank, March 2018, pp. 44-49, and Bartzsch, N., "Transaction balances of small denomination banknotes: findings from the introduction of ES2", in *International Cash Conference*, Deutsche Bundesbank, 2017, pp. 288-311.

in circulation of €5 to €50 banknotes being used for transaction purposes is around €220 billion, i.e. slightly less than 20% of that of all denominations at the end of 2017. However, considering that the saturation had not fully stabilised after 12 months, the active circulation of these denominations is probably somewhat higher. Furthermore, the total share of cash in circulation used for transactions would be higher if the transaction values of the €100, €200 and €500 denominations were also taken into account.

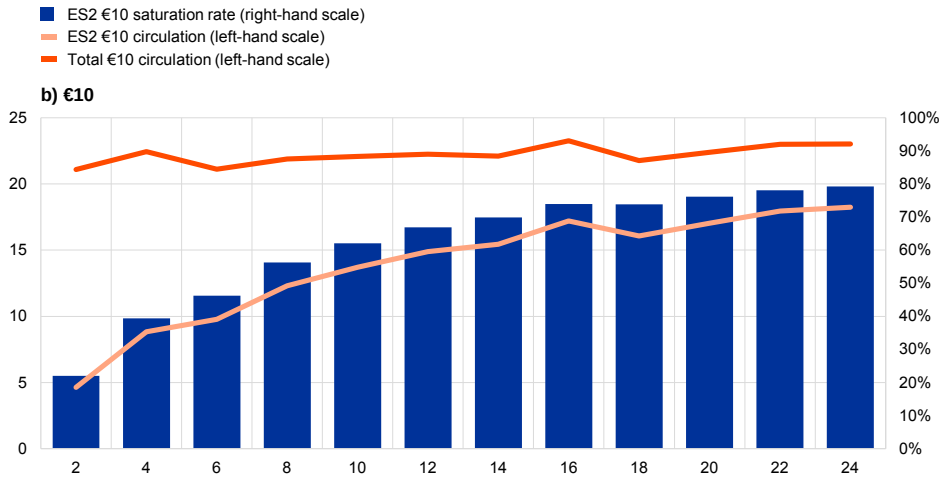
As also shown in Charts 6(a) to (d), two years after the introduction of the Europa series, 27% of €5 and €20 and 21% of €10 banknotes of the first series have still not returned from circulation. The total value of all non-returned €5 to €20 banknotes as at the end of 2017 amounted to €24 billion. Some of these non-returned banknotes may have been lost, taken abroad or stored somewhere and forgotten. In any case all first series euro banknotes can continue to be used.[77]

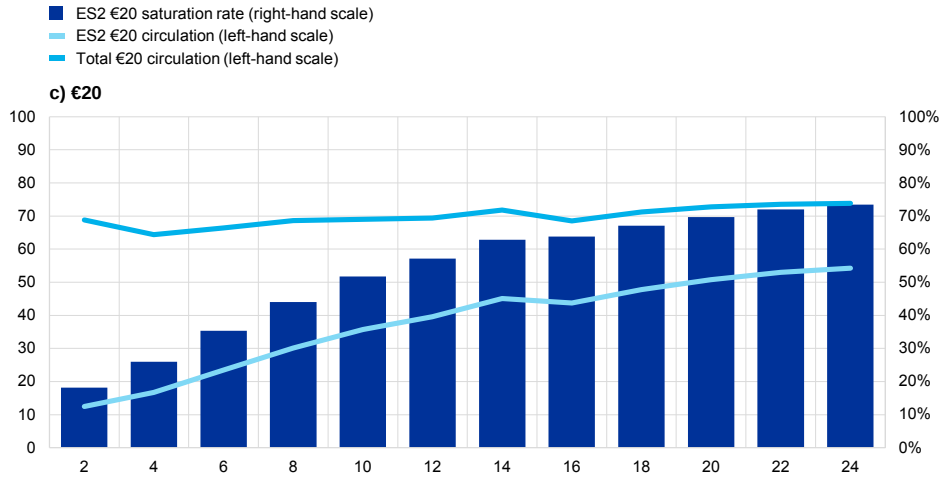
Chart 6

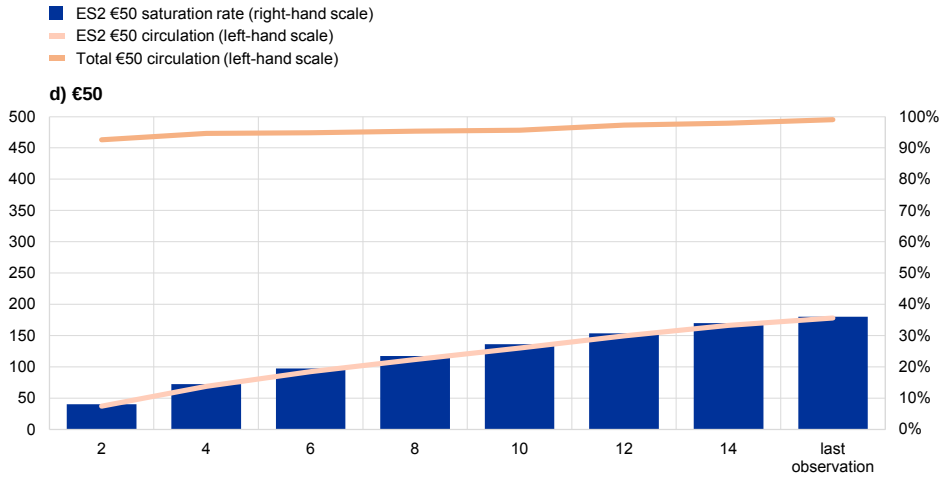
Introduction of the second series of euro banknotes



[77] The ECB may decide to withdraw their legal tender status at some point, following a timely announcement. However, all euro banknotes will always retain their value because it will always be possible to exchange them at the national central banks of the Eurosystem.







Source: ECB calculations based on Currency Information System data.
Notes: The horizontal axis shows the number of months after the initial issuance of the second series banknote.

The return frequency of banknotes also provides an indication of their usage. Another method to estimate active circulation is based on the return frequency of banknotes, i.e. the number of times a banknote comes back to the central bank or a

commercial bank designated by the central bank to hold banknotes on its behalf, within one year.

$$Return\ frequency = \frac{\sum banknotes\ returned\ to\ NCBs\ and\ notes\ held\ to\ order\ deposits, t}{\langle banknote\ circulation \rangle, t}$$

A low return frequency indicates that a denomination is kept in circulation for a long period of time. This could be an indicator of its function as a store of value. According to data for 2017, across the euro area €5, €10 and €20 banknotes came back to central banks an average of two to three times per year, whereas the €50 returned on average only once per year. Higher denominations, meanwhile, return only every two to four years. Considering the €10 as a pure transaction note[78] and applying its return frequency to all other denominations provides an estimate of their usage for transactional purposes. Based on this method, it can be estimated that the value in circulation of all denominations used for transaction purposes is approximately €280 billion, which represents a quarter of the total value in circulation as at the end of 2017.

Table A

Total value of cash used for transactions by denomination based on return frequency

(value, EUR billions)

	EUR 500	EUR 200	EUR 100	EUR 50	EUR 20	EUR 10	EUR 5	Total
Return frequency	0.3	0.3	0.5	1.1	2.8	3.8	1.9	1.7
Value held for transactions	22.7	3.7	32.8	142.7	53.5	21.4	4.5	281.4

Source: ECB calculations based on Currency Information system data.
Notes: €10 circulation based on second series circulation.

From an empirical point of view, it is difficult to clearly define the line between transaction and saving purposes. Both of the methods described above provide only very rough indications of the percentage of banknotes in circulation used for transactions. They both assume a clear distinction between cash that is used for transaction purposes and cash that is used as a store of value, which is of course never really the case. Since the intention of the holder is unknown, the question is whether cash should be considered a store of value after one month, three months, one year, etc. Some people, for example, tend to withdraw a large amount of cash at once and then replenish their wallets gradually from the banknotes stored at home. Furthermore, some of the cash that is hoarded for a long time may ultimately be used to make purchases.

[78] Although the €5 is typically a transaction denomination, it was not chosen as the reference for the estimate because its return frequency is lower than that of the €10 and €20 banknotes. This can be explained by the fact that this denomination is not widely distributed via ATMs and that it is recirculated between merchants and consumers and less-frequently channelled back to a central bank or commercial bank designated by the central bank to store cash on its behalf.

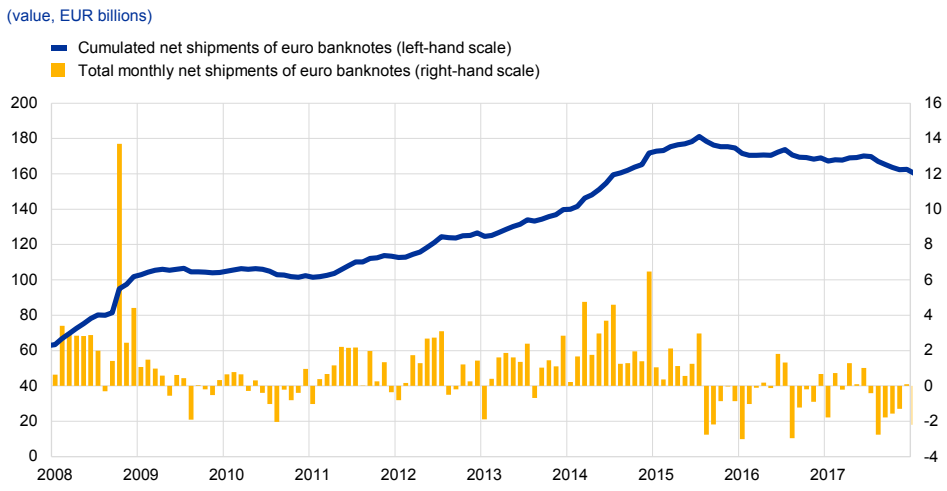
2.2 The use of euro banknotes outside the euro area

International demand for the euro is strong, although it has levelled off since the middle of 2015. Euro banknotes are also held outside the euro area for transaction purposes (e.g. euroisation[79], cross-border shopping, travel for leisure or business) and as a store of value (e.g. savings, currency reserves and asset portfolio management). Non-euro area demand is partially captured in the net shipments data, which cover registered flows of euro banknotes between central banks and MFIs in the euro area, on the one hand, and any legal persons outside the euro area, on the other. As at the end of 2017 the total cumulated net shipments (i.e. exports minus imports) of euro banknotes to regions outside the euro area amounted to €162.5 billion, which represented 13.9% of the total value in circulation (see Chart 7).

Monthly net shipments of euro banknotes have shown significant volatility during the period under review. The highest peaks in demand for euro banknotes occurred in October 2008, following the bankruptcy of Lehman Brothers, and when the EUR/RUB exchange rate jumped from 57.5 at the end of November 2014 to 70.3 by the end of the next month. Cumulated net shipments began to fall in August 2015.

Chart 7

Net shipments of euro banknotes to/from regions outside the euro area



Source: ECB Statistical Data Warehouse.
Notes: The latest observations are for 31 December 2017.

The fall in net shipments as of August 2015 can be attributed to a combination of factors. The perception of declining geopolitical uncertainty and increasing stability in regions bordering the euro area (e.g. Russia) as well as the Governing Council decision on the €500 may have driven down exports of €500 banknotes, while efforts by local authorities to promote the use of domestic currencies in euroised countries (i.e. the Western Balkans) may have led to increased imports of euro banknotes.[80] This is supported by the figures in Charts 8 and 9. The decline in net shipments can be attributed both to the fall in euro banknote exports (especially of the €500) and to the

[79] Montenegro and Kosovo use the euro as a currency without a formal arrangement.

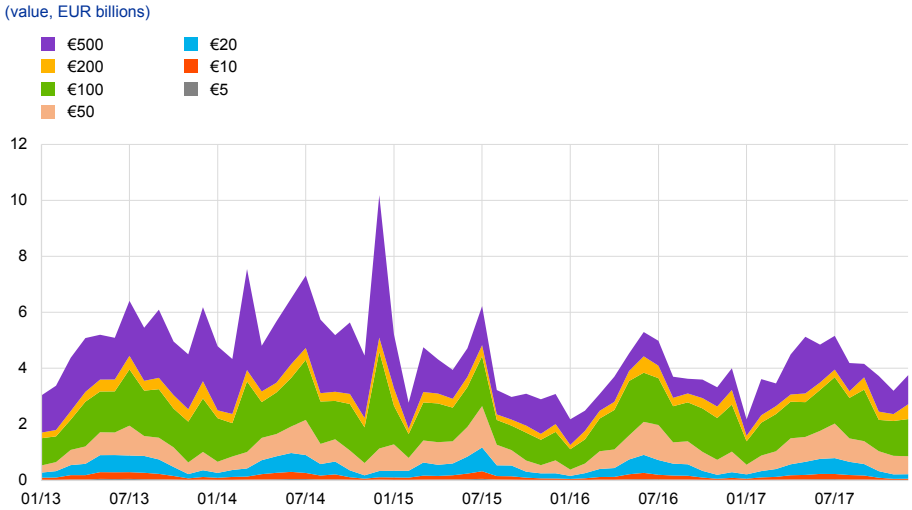
[80] "The international role of the euro – Interim report", ECB, June 2018, pp. 24-25.

increase in imports (mainly of the €50).[81] More information on the circulation of euro banknotes outside the euro area can be found in the section on sales and purchases of euro banknotes by region (Box 2).

The €100 banknote is the preferred denomination on the international market. In more general terms, since February 2016 the €100 banknote has been the preferred denomination on the international market, overtaking the €500. The €50 is the most imported banknote, with total cumulated imports greater than total cumulated exports. This can be seen as a sign that more €50 banknotes leave the euro area unregistered and return via official channels than the other way around. This could, for example, occur when remitters take cash back to their home country or to countries in which their families live, when euro area tourists use euro banknotes in neighbouring countries where it is accepted (e.g. Turkey or Bulgaria) and, probably to a much lesser extent, when non-euro area tourists or business travellers leave the euro area and take euro banknotes with them. Low-denomination and €200 banknotes play a minor role in overseas demand. Nevertheless, it is worth noting that a large percentage of exported €200 banknotes is not reimported (between January 2013 and the end of 2017 the value of exported and imported €200 banknotes reached €20.9 billion and €4.6 billion, respectively).

Chart 8

Monthly exports of euro banknotes

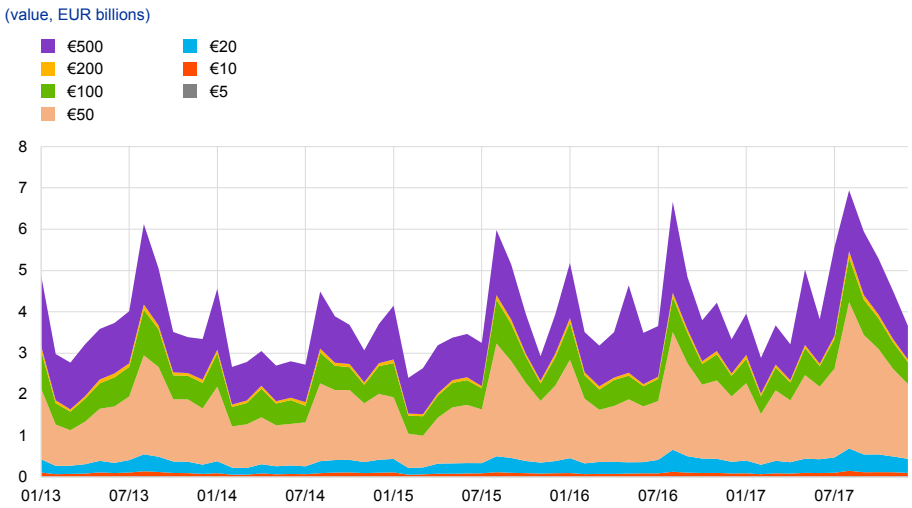


Source: ECB Statistical Data Warehouse.

[81] The collection of data on imports and exports of banknotes started in January 2013.

Chart 9

Monthly imports of euro banknotes



Source: ECB Statistical Data Warehouse.

A large percentage of the total number of euro banknotes in circulation may be held abroad. It is very difficult to estimate the amount of cash held outside the euro area. A method published on the ECB website[82] proposes calculating the minimum and maximum value of banknotes circulating outside the euro area on the basis of net shipments data (with a correction for the negative net shipments of €50), on the one hand, and a coins to banknotes ratio, taking into account the relative changes in the value of coins and banknotes in circulation, on the other hand. This method relies on the assumption that coin circulation abroad is negligible and that the increase in the value of coins in circulation is entirely the result of transaction needs within the euro area. The final estimate is given by the average of the two boundaries. Based on this method, it is estimated that around 30% of the total value in circulation (approximately €350 billion) was held outside the euro area at the end of 2017.

Box 2

Sales and purchases of euro banknotes to/from regions outside the euro area

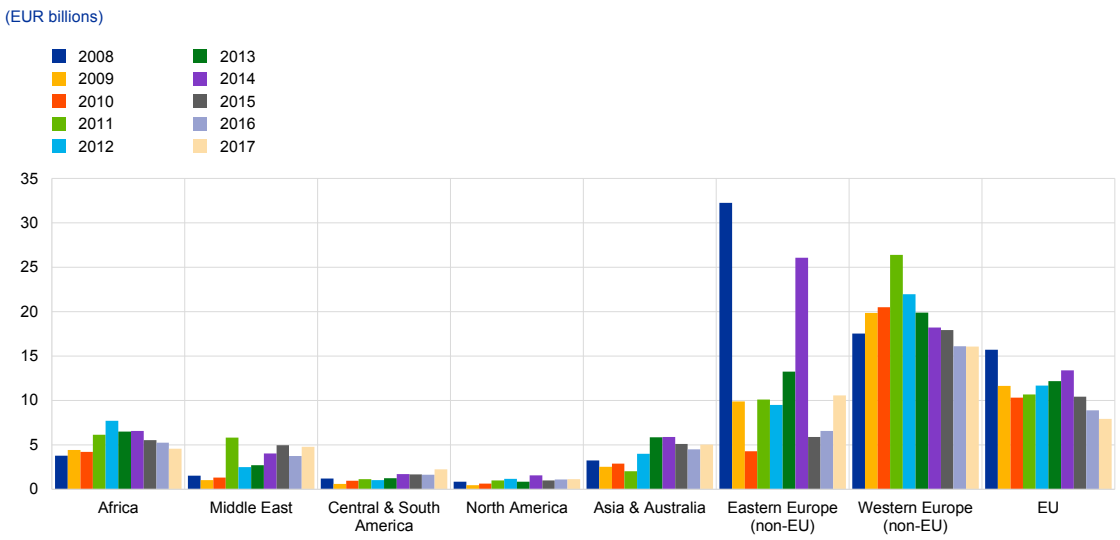
Prepared by Olivier Strube

Banknote wholesalers act as intermediaries between national central banks (NCBs) and commercial banks, bureaux de change and central banks in regions outside the euro area. They are responsible for most of the transactions included in the monthly net shipments statistics. The ECB has been collecting euro banknote trade data from these international banknote wholesalers, of which around ten operate globally or at least in certain regions of the world, on an annual basis. In terms of value, from 2008 to 2017 sales by wholesalers (euro banknote exports) decreased by around 30% while their purchases (euro banknote imports) increased by around 40%. In 2017 overall sales amounted to €52 billion and overall purchases to €55 billion. Charts A and B show sales and purchases by region from 2008 to 2017. Chart A illustrates the volatility of the Russian market, which represents a large share of eastern European (non-EU) sales.

[82] See "Estimation of euro currency in circulation outside the euro area", ECB, April 2017.

Chart A

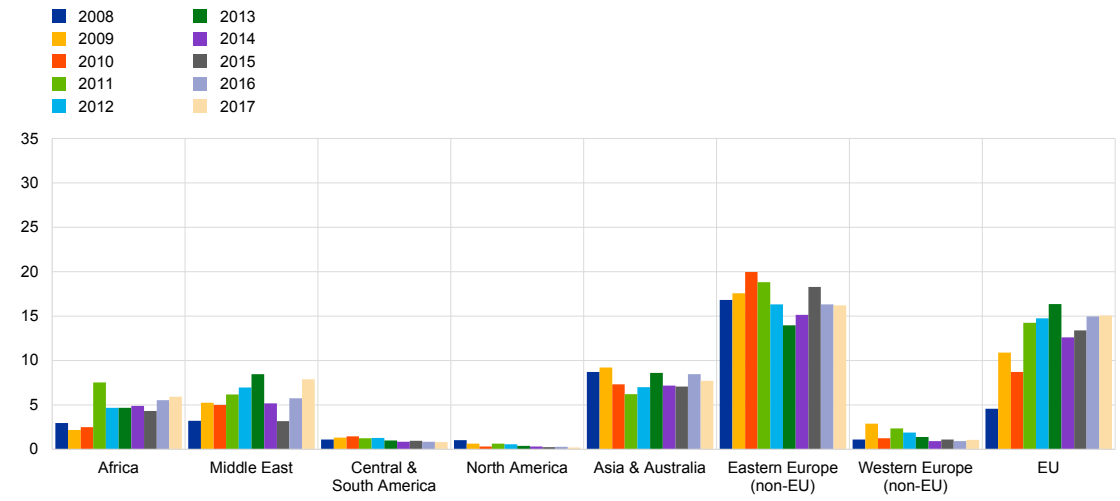
Time series of sales of euro banknotes by region



Source: Wholesalers' reports.

Chart B

Times series of the purchases of euro banknotes by region



Source: Wholesalers' reports.

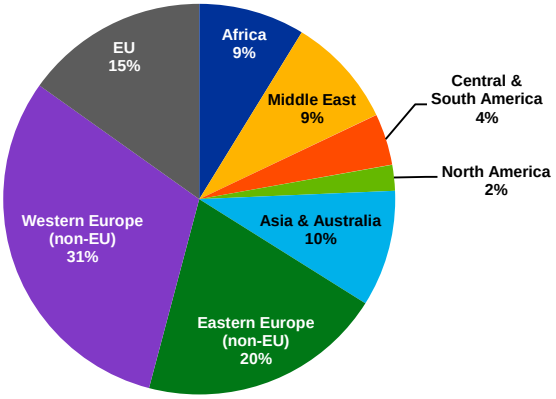
Charts C and D indicate that, in 2017, around two-thirds of the value of all euro banknote shipments of wholesale banks related to purchase and sale transactions with European countries, including Russia and Turkey. On the sales side (see Chart C) exports to Switzerland, which is included in western Europe (non-EU), dominated, accounting for 28% of all euro banknote sales in 2017. Euro banknotes are dispensed by many ATMs in Switzerland and used for shopping in the surrounding euro area countries. 20% of all sales went to eastern Europe (non-EU), mostly to Russia, where euro banknotes serve predominantly as a store of value. The EU, in this case primarily the United Kingdom, accounted for 15% of all sales. That demand can be linked to tourism, in the form of British residents withdrawing euro banknotes before going abroad. On the purchase side (see Chart D), eastern non-EU countries, especially Turkey, predominated in 2017 and accounted for 30%

of all banknote purchases. These euro banknotes were either carried to Turkey by Turkish workers in the euro area (remittances) or by tourists. Similarly, the high share of purchases from EU countries (28%) can be explained by remittances.

Chart C

Exports of euro banknotes by region in 2017

(percentages)

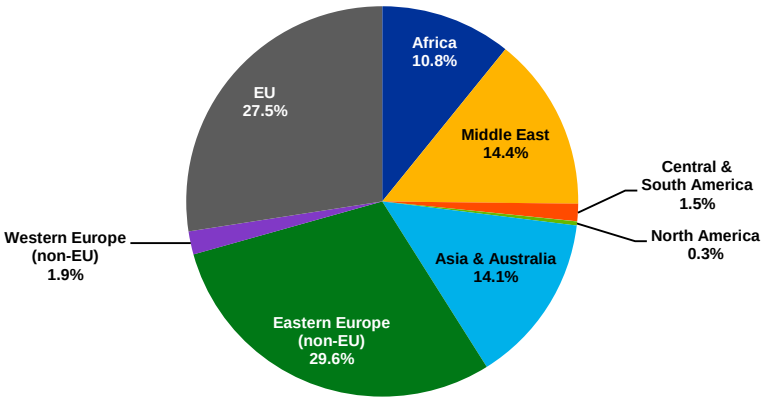


Source: Wholesalers' reports.

Chart D

Imports of euro banknotes by region in 2017

(percentages)



Source: Wholesalers' reports.

Asia & Australia, the Middle East and Africa, in this case primarily sub-Saharan Africa, were responsible for roughly equal shares of the sales to regions outside the euro area. On the purchase side, China and the United Arab Emirates dominated thanks to their roles as international marketplaces where goods are traded using international currencies. The significant purchases from Africa, in this case primarily northern Africa, can be explained by remittances and tourism. Euro banknote transactions with the Americas have traditionally been negligible due to the prevailing role of the US dollar in those regions.

2.3 The use of cash as a domestic store of value

In line with the Keynesian approach to the demand for money, speculation and precautionary motives are the two other motives for holding cash. As seen in previous sections, financial or currency crises affecting currencies in regions neighbouring the euro area have the potential to increase demand for euro banknotes as a precautionary measure. At the same time, a lack of trust in the euro can have a negative impact on demand for euro banknotes. In terms of speculation, the main determinant of cash demand relates to the opportunity costs of holding cash. The low interest rates of the past ten years mean that the opportunity costs of holding cash have been reduced for consumers and firms. Meanwhile, some banks have used cash to avoid the negative interest rates on the ECB's deposit facility or on their current accounts with central banks (see Box 3).

Box 3

The cash holdings of monetary financial institutions in the euro area

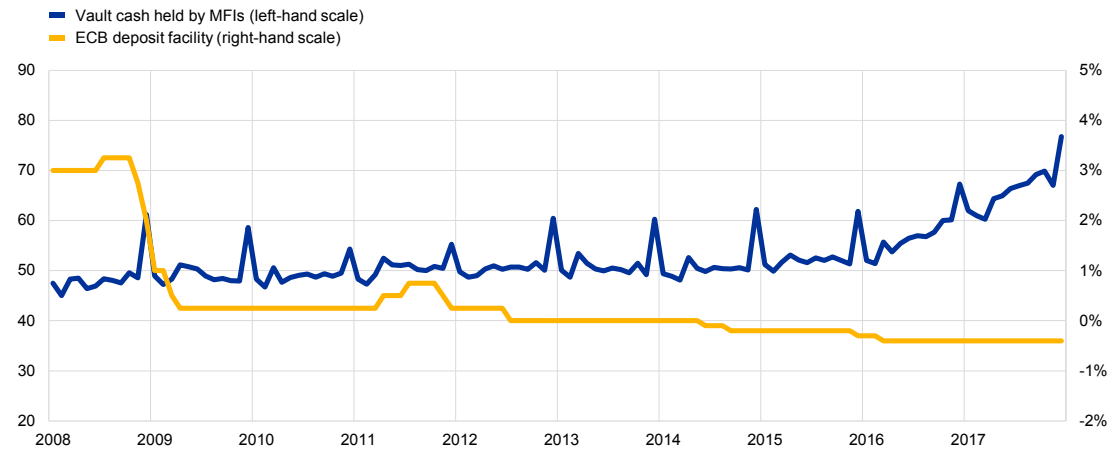
Prepared by Laure Lalouette

The interest rate on the ECB deposit facility was lowered to 0% on 11 July 2012. It was then lowered by a further 0.10 percentage point on 11 June 2014, on 10 September 2014 and again on 9 December 2015. These decisions did not have a noticeable impact on the amount of cash held by MFIs (i.e. in their vaults and in cash dispensers, referred to as vault cash) until 16 March 2016, when the Governing Council decided to lower the interest rate on the ECB deposit facility to -0.40%. This decision represented a pivotal point for some MFIs, after which they decided to convert part of their liquidity into cash, as illustrated in Chart A. For these MFIs, the costs of cash (i.e. costs associated with cash storage and handling) were obviously less than the losses resulting from the negative yields from the ECB deposit facility and current accounts held at NCBs. An average of €50.1 billion was held as vault cash by MFIs between January 2008 and March 2016. Between March 2016 and December 2017 the amount of vault cash held by MFIs increased by €21.1 billion and reached €76.8 billion, i.e. 6.6% of the total value in circulation. The increase in vault cash was mostly driven by German MFIs (69.4% of the increase) and, to a lesser extent, by Italian, French, Austrian and Spanish MFIs.

Chart A

Vault cash held by MFIs and interest rates

(value, EUR billions)



Source: ECB Statistical Data Warehouse.
Notes: The latest observations are for 31 December 2017. Deposit facility rates shown are the rates at the end of each month.

This increase in vault cash has, however, remained limited. Logistical constraints such as storage capacities or maximum amounts covered by insurance are the most likely limitations on MFIs holding larger amounts of cash.

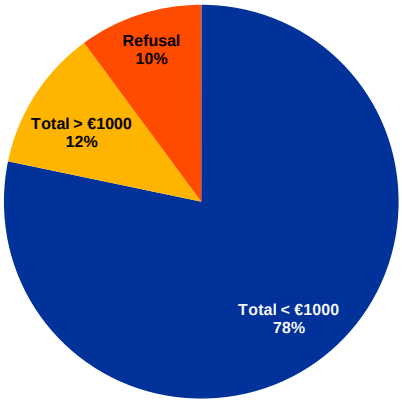
There are several methods to estimate the share of cash used as a store of value, including direct methods (by means of surveys) and indirect methods. Surveys tend to underestimate the use of cash as a store of value, as respondents are often not comfortable disclosing to research companies that they store cash at home or in another safe place. Moreover, respondents may not be willing to disclose the real amount of their savings, especially if such amounts are substantial. The questions in the "The use of cash by households in the euro area" study which focused on cash held at home by the respondents as precautionary reserves provide some insights into hoarding behaviour across the euro area in 2016. Results show that almost 25% of respondents have at least some cash outside a bank account, either at home or in a safe place. Of those, 78% stated that they keep less than €1,000 in total, 12% that they keep more than €1,000 and 10% refused to answer (see Chart 10). Those respondents hoarding more than €1,000 in total may have a noticeable impact on the average amount used as a store of value, but as there is no indication of the exact value no estimate can be made on the basis of these results. Nevertheless, the results show that people do store cash, and that some even store considerable amounts.

Chart 10

Precautionary cash reserves

Question: Could you provide an approximate amount of cash that you keep outside a bank account as a precautionary reserve or as an alternative way of saving?

(percentages, based on 7,611 respondents from the euro area)



Sources: ECB and De Nederlandsche Bank.
Notes: German results excluded given lack of available data. This survey was conducted in 2016.

A simple indirect method to estimate the share of cash used as a store of value is to assume that domestic hoarding is the residual of the circulation being used for transaction purposes, held by MFIs or held abroad. In this case, it can be inferred from the previous sections that more than one-third of total euro banknote circulation may currently be in use as a store of value within the euro area. Considering the numerous assumptions made, however, these estimates should be viewed with a significant degree of caution.

Box 4

Growth in euro coin circulation over the last ten years

Prepared by Laure Lalouette and Elisabetta Maria Saini

Unlike the issuance of euro banknotes, the issuance of euro coins is a national competence. NCBs are responsible for the physical distribution of euro coins in nearly all euro area countries, although the ECB is responsible for approving the annual volume of coins that euro countries may issue.

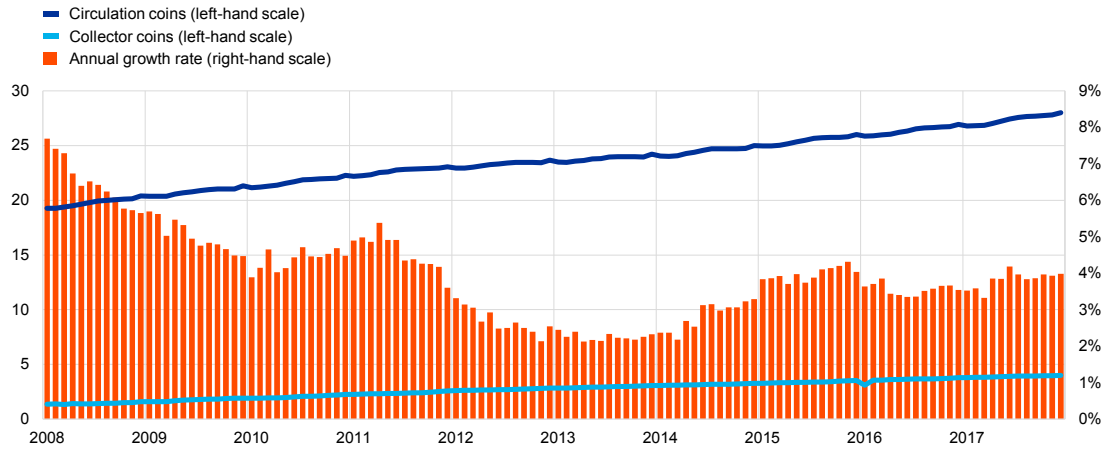
In a manner similar to banknote circulation, the value of euro coin circulation grew continuously during the period from 2008 to 2017, at an average annual rate of 4.0%. Overall, the total value of euro coins in circulation at the end of 2017 was €28 billion (see Chart A). In addition to coins intended for circulation, each country may also issue collector coins. The total value in circulation of the latter at the end of 2017 was €4 billion. Of the eight coin denominations, the €2 has the highest share of the value in circulation followed by the €1, with 43.4% and 25.7%, respectively, at the end of 2017 (see Chart B). 1, 2 and 5 euro cent coins together accounted for only 6.7% of the total value in circulation, although they made up 64.1% of the number of coins in circulation. The high production requirements

for the 1 and 2 euro cent coins compared to their limited active use in circulation has led to the introduction of rounding rules in some euro area countries.[83]

Chart A

Circulation of euro coins

(value, EUR billions)

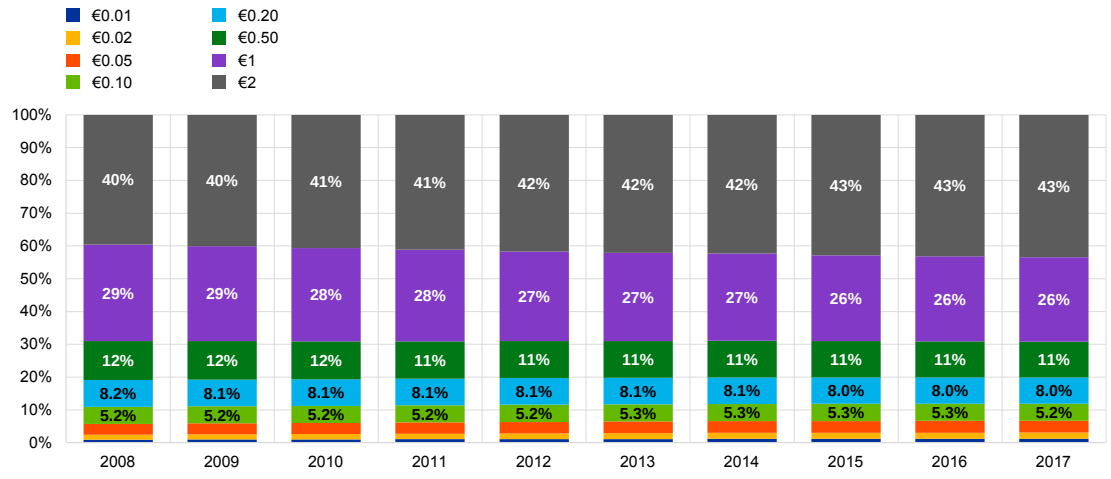


Source: ECB Currency Information System.
Notes: The latest observations are for 31 December 2017.

Chart B

Share by denomination of euro coins in circulation

(value, share)



Source: ECB Currency Information System.
Notes: The latest observations are for 31 December 2017.

In order to better understand how the 1 and 2 cent coins are used, the ECB included a question on what people do with 1 and 2 euro cent coins received as change in the 2016 survey on the use of cash. The results are illustrated in Chart C. According to these results, 37% of the respondents reported that they don't use these coins when they receive them as change, with most of them putting

[83] In Ireland (since October 2015), in the Netherlands (since September 2004) and in Belgium (since 2014), retailers are free to decide whether they wish to round cash payments to the nearest 5 cents, although they are reluctant to apply it in the third country. In Finland, the rounding rule has been mandatory since the launch of the euro. In Malta, the implementation of a rounding rule is being examined. The Italian Mint discontinued the production of 1 and 2 cent euro coins in January 2018.

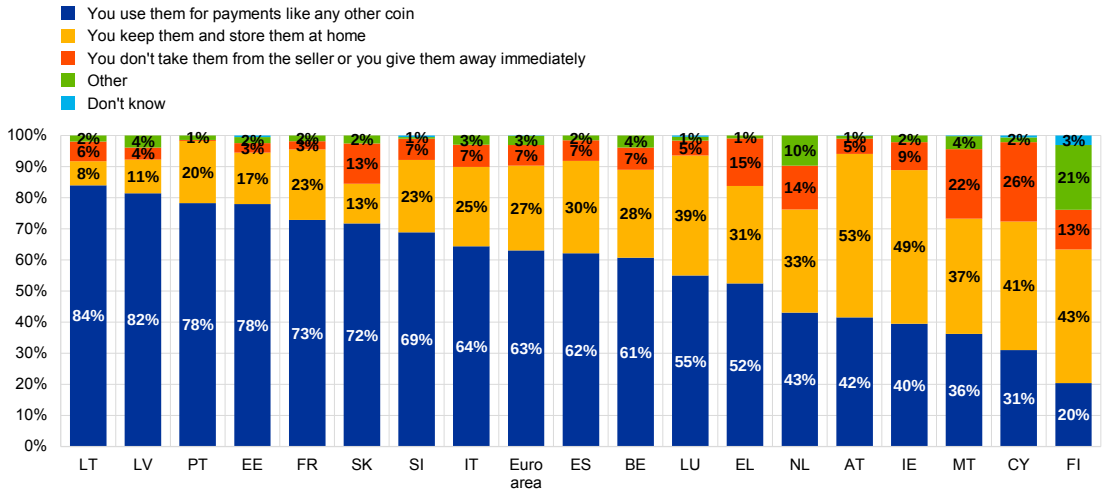
them in a jar or box at home. Slightly less than two-thirds of the respondents (63%) stated that they use them for subsequent payments. As with all aspects of payment behaviour, the use of 1 and 2 cent coins varies greatly from country to country. Logically, in those countries in which rounding rules have been introduced fewer people tend to use the 1 and 2 cent coins if they happen to receive them.

Chart C

Use of 1 and 2 euro cent coins by country

Question: What do you usually do when you receive 1 and 2 cent coins as change?

(percentages; based on 23,544 respondents from the euro area)



Sources: ECB and De Nederlandsche Bank.
Note: Results not available for Germany. This survey was conducted in 2016.

3 Conclusions

In recent years, euro banknote circulation has shown robust average growth above GDP. The demand for banknotes is determined by various factors, one of which is the use for transaction purposes. The results of a study on payment behaviour in 2016 showed that cash was still the most frequently used method of payment at POS in the euro area. Transaction demand, however, appears to only partially explain the growth in banknote circulation. The demand for banknotes has also been impacted by various additional factors such as the financial and sovereign debt crises, geopolitical uncertainties, exchange rate developments and policy decisions

Cash can be expected to remain an important means of payment at POS in most euro area countries for the foreseeable future. Nevertheless, the rapid rise in the use of contactless cards and mobile payments, the increase in online shopping and the development of instant payments, on the basis of which new retail payment solutions may emerge, can all be expected to have a noticeable impact on the use of cash for transaction purposes. Although the speed of a subsequent decline in the use of cash for transaction purposes cannot be predicted, it seems obvious that it will occur. As described in this article, however, the use of cash for transaction purposes is only one driver of banknote demand.

Most euro banknotes in circulation are used as a store of value in the euro area or held abroad. Considering that the opportunity costs of holding cash are currently low, if interest rates increase some of the stored euro banknotes can be expected to return. The fall in net shipments of euro banknotes to countries outside the euro area shows that some of the cash that was held abroad for various reasons is very gradually coming back. However, as shown by developments over the past ten years, the store of value function is determined not only by interest rates, but also by external events which cannot be predicted. While future developments may, therefore, lead to an increase or decrease in the use of cash as a store of value depending on users' trust in the euro, current developments suggest that euro banknotes are considered a reliable means of holding liquidity and storing wealth, both within the euro area and abroad. Households and firms both inside and outside the euro area obviously value the fact that euro banknotes allow them to store part of their assets in central bank money.

Statistics

Contents

Further information

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

Conventions used in the tables

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

1 External environment

1.1 Main trading partners, GDP and CPI

	GDP [1] (period-on-period percentage changes)						CPI (annual percentage changes)						
	G20	United States	United Kingdom	Japan	China	Memo item: euro area	OECD countries		United States	United Kingdom (HICP)	Japan	China	Memo item: euro area [2] (HICP)
							Total	excluding food and energy					
	1	2	3	4	5	6	7	8	9	10	11	12	13
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	1.6	1.8	1.0	6.7	1.9	1.1	1.8	1.3	0.7	-0.1	2.0	0.2
2017	3.8	2.2	1.7	1.7	6.8	2.4	2.3	1.8	2.1	2.7	0.5	1.6	1.5
2017 Q3	1.0	0.7	0.4	0.6	1.8	0.7	2.2	1.8	2.0	2.8	0.6	1.6	1.4
Q4	1.0	0.6	0.4	0.2	1.6	0.7	2.3	1.9	2.1	3.0	0.6	1.8	1.4
2018 Q1	0.9	0.5	0.2	-0.2	1.4	0.4	2.2	1.9	2.2	2.7	1.3	2.2	1.3
Q2	.	1.0	0.4	0.7	1.8	0.4	.	.	2.7	2.4	0.7	1.8	1.7
2018 Mar.	-	-	-	-	-	-	2.3	2.0	2.4	2.5	1.1	2.1	1.3
Apr.	-	-	-	-	-	-	2.3	1.9	2.5	2.4	0.6	1.8	1.3
May	-	-	-	-	-	-	2.6	2.0	2.8	2.4	0.7	1.8	1.9
June	-	-	-	-	-	-	.	.	2.9	2.4	0.7	1.9	2.0
July	-	-	-	-	-	-	.	.	2.9	.	0.9	2.1	2.1
Aug. [3]	-	-	-	-	-	-	.	.	.	.	.	.	2.0

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	1.0	3.6	-0.6
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	5.3	3.1	6.9
2017 Q3	53.3	54.9	54.1	51.8	51.9	56.0	52.7	53.5	51.9	1.5	1.2	1.7
Q4	53.4	54.6	55.1	52.6	51.9	57.2	53.5	53.4	52.2	1.4	1.4	1.5
2018 Q1	53.6	54.6	53.4	52.1	53.0	57.0	53.8	53.5	52.3	2.2	0.7	3.2
Q2	53.9	55.9	54.3	52.3	52.5	54.7	53.2	54.2	50.2	-0.6	-1.0	-0.3
2018 Mar.	52.8	54.2	52.4	51.3	51.8	55.2	52.9	52.8	51.2	2.2	0.7	3.2
Apr.	53.6	54.9	53.2	53.1	52.3	55.1	53.5	53.6	50.3	0.2	-0.3	0.6
May	54.1	56.6	54.5	51.7	52.3	54.1	53.1	54.4	50.3	-0.3	-1.0	0.1
June	54.1	56.2	55.2	52.1	53.0	54.9	53.0	54.5	50.0	-0.6	-1.0	-0.3
July	53.6	55.7	53.5	51.8	52.3	54.3	52.7	53.9	50.0	.	.	.
Aug.	53.2	54.7	54.2	52.0	52.0	54.5	52.8	53.3	49.9	.	.	.

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
2018 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
June	-0.36	-0.37	-0.32	-0.27	-0.18	2.33	-0.04
July	-0.36	-0.37	-0.32	-0.27	-0.18	2.34	-0.04
Aug.	-0.36	-0.37	-0.32	-0.27	-0.17	2.32	-0.04

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
2018 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
June	-0.62	-0.71	-0.68	-0.26	0.38	1.09	0.54	0.60	-0.75	-0.52	0.53	1.31
July	-0.62	-0.65	-0.59	-0.16	0.46	1.11	0.54	0.60	-0.64	-0.39	0.61	1.36
Aug.	-0.63	-0.67	-0.63	-0.23	0.37	1.04	0.41	0.71	-0.68	-0.46	0.50	1.28

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
2018 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
June	383.4	3,442.8	797.5	273.1	719.5	346.7	169.0	647.2	543.6	279.9	290.9	828.1	2,754.4	22,562.9
July	383.8	3,460.9	793.5	273.8	711.4	353.1	169.4	647.6	536.6	287.9	291.0	838.8	2,793.6	22,309.1
Aug.	382.5	3,436.8	785.2	273.0	711.6	357.5	167.9	653.3	529.4	282.1	288.7	834.2	2,857.8	22,494.1

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 Aug.	0.05	0.44	0.35	0.75	6.23	16.80	5.32	5.89	6.34	2.38	1.75	2.01	1.91	1.94	2.21	1.91
Sep.	0.05	0.44	0.35	0.74	6.26	16.80	5.07	5.71	6.20	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	1.68	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	1.87	1.91	1.90	2.14	1.84
Feb.	0.04	0.44	0.34	0.69	6.19	16.86	4.72	5.70	6.19	2.37	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	1.63	1.84	1.95	1.91	2.14	1.84
Apr.	0.04	0.45	0.34	0.61	6.12	16.84	4.95	5.67	6.15	2.36	1.62	1.85	1.96	1.90	2.13	1.83
May	0.04	0.46	0.34	0.57	6.10	16.87	4.83	5.88	6.39	2.39	1.58	1.87	1.97	1.90	2.13	1.83
June	0.03	0.46	0.33	0.63	6.04	16.84	4.47	5.64	6.10	2.31	1.60	1.84	1.97	1.88	2.12	1.82
July [(p)]	0.03	0.45	0.33	0.63	6.01	16.80	4.85	5.75	6.22	2.41	1.63	1.85	1.93	1.85	2.12	1.81

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 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	2.35	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	2.52	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.	0.04	0.06	0.31	2.32	2.36	2.42	2.33	1.68	1.61	1.74	1.23	1.29	1.65	1.70
May	0.03	0.08	0.43	2.28	2.31	2.47	2.37	1.65	1.61	1.74	1.07	1.23	1.65	1.62
June	0.04	0.07	0.74	2.29	2.27	2.44	2.31	1.64	1.56	1.70	1.21	1.33	1.70	1.68
July [(p)]	0.03	0.09	0.38	2.27	2.16	2.41	2.28	1.67	1.59	1.68	1.14	1.31	1.66	1.64

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	1,241	519	156	.	70	438	57	368	167	55	.	37	79	31
2018 Feb.	1,288	540	159	.	80	444	65	362	172	48	.	34	78	30
Mar.	1,307	542	161	.	84	453	67	389	168	63	.	41	84	33
Apr.	1,322	543	167	.	94	450	69	396	181	50	.	43	73	49
May	1,311	539	163	.	99	445	66	384	182	39	.	44	79	41
June	1,293	523	163	.	90	457	59	382	157	65	.	43	82	36
July	1,307	528	168	.	97	453	60	428	197	63	.	48	79	42
Long-term														
2015	15,250	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	3,141	.	1,190	6,819	642	248	66	75	.	17	83	7
2018 Feb.	15,387	3,566	3,157	.	1,172	6,864	629	207	57	44	.	12	88	7
Mar.	15,437	3,580	3,146	.	1,183	6,904	624	287	68	91	.	24	96	7
Apr.	15,440	3,578	3,161	.	1,192	6,886	624	232	61	67	.	14	85	4
May	15,526	3,586	3,192	.	1,201	6,927	621	202	49	53	.	17	80	3
June	15,532	3,574	3,190	.	1,204	6,944	620	222	64	64	.	14	72	7
July	15,552	3,566	3,199	.	1,210	6,957	620	228	55	62	.	17	87	8

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	16,518.8	4,303.1	3,432.4	.	1,122.0	6,958.9	702.4	6,814.4	584.3	985.3	5,244.9
2016	16,638.7	4,212.9	3,368.7	.	1,245.5	7,108.1	703.5	7,089.5	537.6	1,097.8	5,454.1
2017	16,592.7	4,079.4	3,296.1	.	1,260.1	7,257.3	699.8	7,954.8	612.5	1,263.0	6,079.3
2018 Feb.	16,675.3	4,106.4	3,316.0	.	1,252.1	7,307.4	693.4	7,920.3	638.6	1,293.1	5,988.6
Mar.	16,744.0	4,122.2	3,307.4	.	1,267.9	7,356.1	690.5	7,814.0	599.0	1,253.4	5,961.7
Apr.	16,762.3	4,121.0	3,327.9	.	1,285.5	7,335.1	692.8	8,143.3	620.8	1,351.3	6,171.2
May	16,837.8	4,125.4	3,354.6	.	1,299.4	7,371.5	686.8	8,028.1	531.2	1,301.5	6,195.3
June	16,824.6	4,096.7	3,352.6	.	1,294.1	7,401.4	679.8	7,959.7	543.5	1,278.8	6,137.5
July	16,859.0	4,094.0	3,367.2	.	1,306.5	7,410.3	680.8	8,168.5	576.1	1,304.6	6,287.9
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	0.1	.	6.3	2.2	0.5	1.1	6.1	2.8	0.3
2018 Feb.	1.4	-1.0	1.3	.	5.6	2.3	-0.8	0.9	3.1	2.8	0.4
Mar.	1.6	-0.1	2.2	.	6.0	2.0	-2.7	1.0	1.5	3.6	0.4
Apr.	1.6	0.5	1.2	.	6.0	2.0	-0.8	1.3	1.5	5.4	0.5
May	1.1	-0.1	0.3	.	6.1	1.5	-1.9	1.4	1.6	5.3	0.5
June	1.1	-0.6	1.2	.	6.0	1.7	-4.0	1.3	1.6	4.9	0.5
July	1.1	-0.9	0.4	.	5.1	2.3	-2.5	1.2	0.4	4.7	0.6

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	81.3	88.2	105.7	87.0
2016	94.4	89.5	90.9	84.9	80.5	89.3	109.7	88.9
2017	96.6	91.4	92.0	85.8	80.6	90.0	112.0	90.0
2017 Q3	98.6	93.2	93.8	87.6	81.4	91.5	114.5	91.8
Q4	98.6	93.2	93.5	87.4	81.0	91.3	115.0	92.0
2018 Q1	99.6	94.0	94.4	88.0	81.7	91.7	117.0	93.4
Q2	98.4	93.1	93.2	.	.	.	117.0	93.4
2018 Mar.	99.7	94.2	94.5	-	-	-	117.7	93.9
Apr.	99.5	93.9	94.2	-	-	-	117.9	94.0
May	98.1	92.8	92.8	-	-	-	116.6	93.1
June	97.9	92.6	92.5	-	-	-	116.7	93.0
July	99.2	93.8	93.6	-	-	-	118.2	94.2
Aug.	99.0	93.6	93.2	-	-	-	119.0	94.8
Percentage change versus previous month								
2018 Aug.	-0.2	-0.3	-0.4	-	-	-	0.7	0.6
Percentage change versus previous year								
2018 Aug.	-0.1	0.0	-1.1	-	-	-	3.5	2.7

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 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
Q2	7.602	7.398	25.599	7.448	317.199	130.045	4.262	0.876	4.6532	10.330	1.174	1.191
2018 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
June	7.551	7.382	25.778	7.449	322.697	128.529	4.304	0.879	4.6623	10.279	1.156	1.168
July	7.850	7.397	25.850	7.452	324.597	130.232	4.324	0.887	4.6504	10.308	1.162	1.169
Aug.	7.909	7.426	25.681	7.456	323.021	128.200	4.286	0.897	4.6439	10.467	1.141	1.155
Percentage change versus previous month												
2018 Aug.	0.7	0.4	-0.7	0.0	-0.5	-1.6	-0.9	1.1	-0.1	1.5	-1.8	-1.2
Percentage change versus previous year												
2018 Aug.	0.4	0.3	-1.6	0.2	6.1	-1.2	0.4	-1.6	1.4	9.6	0.1	-2.2

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 Q2	24,750.0	25,174.2	-424.2	10,943.9	8,779.9	8,121.0	10,632.4	-46.0	5,048.5	5,761.9	682.7	13,843.7
Q3	24,511.8	24,961.5	-449.7	10,603.3	8,508.3	8,268.7	10,664.8	-57.1	5,022.0	5,788.3	674.8	13,742.3
Q4	24,655.4	24,897.1	-241.7	10,518.9	8,485.9	8,516.7	10,611.7	-51.7	5,001.8	5,799.5	669.7	13,566.5
2018 Q1	24,600.8	25,193.6	-592.8	10,392.4	8,520.4	8,491.5	10,660.8	-85.6	5,129.1	6,012.4	673.4	13,810.7
Outstanding amounts as a percentage of GDP												
2018 Q1	218.0	223.2	-5.3	92.1	75.5	75.2	94.5	-0.8	45.5	53.3	6.0	122.4
Transactions												
2017 Q3	69.2	-57.7	126.9	-153.1	-146.3	187.4	53.1	-10.3	44.6	35.6	0.5	-
Q4	85.2	-67.8	153.0	36.3	-1.9	90.9	23.4	10.7	-54.6	-89.3	1.9	-
2018 Q1	474.8	322.4	152.5	95.2	-38.7	193.5	141.7	-4.2	178.8	219.4	11.6	-
Q2	134.4	117.6	16.9	-10.0	22.6	10.6	-67.9	17.0	110.2	162.9	6.6	-
2018 Jan.	347.0	330.3	16.7	42.6	1.4	102.5	84.1	0.2	199.3	244.8	2.3	-
Feb.	137.6	101.7	35.8	33.6	0.9	44.6	-3.7	-0.6	60.1	104.5	-0.1	-
Mar.	-9.7	-109.6	99.9	18.9	-41.1	46.4	61.3	-3.8	-80.6	-129.8	9.4	-
Apr.	94.4	100.2	-5.8	20.4	-13.0	18.0	-9.4	1.7	58.0	122.5	-3.6	-
May	130.1	141.6	-11.5	9.2	27.1	-4.2	-31.3	7.0	115.6	145.9	2.3	-
June	-90.0	-124.2	34.2	-39.6	8.5	-3.2	-27.2	8.3	-63.3	-105.5	7.9	-
12-month cumulated transactions												
2018 June	763.7	314.5	449.2	-31.6	-164.3	482.4	150.1	13.3	279.0	328.7	20.5	-
12-month cumulated transactions as a percentage of GDP												
2018 June	6.7	2.8	3.9	-0.3	-1.4	4.2	1.3	0.1	2.5	2.9	0.2	-

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	10,532.4	10,057.5	5,742.9	2,172.7	2,109.1	1,015.3	639.3	448.6	32.8	474.9	4,864.5	4,389.5
2016	10,809.4	10,332.9	5,877.1	2,222.8	2,205.2	1,055.2	676.1	468.4	27.8	476.4	4,935.7	4,459.3
2017	11,188.4	10,668.0	6,058.7	2,277.2	2,294.5	1,120.0	713.3	455.7	37.7	520.4	5,288.1	4,767.7
2017 Q3	2,814.2	2,676.2	1,518.1	571.1	574.9	282.0	180.1	111.4	12.2	138.0	1,324.0	1,186.0
Q4	2,841.1	2,701.2	1,531.5	575.5	587.0	287.5	184.6	113.5	7.2	139.8	1,358.6	1,218.7
2018 Q1	2,861.5	2,721.8	1,544.0	577.8	591.0	292.1	183.6	113.9	9.0	139.7	1,355.1	1,215.4
Q2	2,883.8	2,753.5	1,553.0	584.1	600.7	296.1	188.3	114.8	15.8	130.3	1,369.4	1,239.1
	as a percentage of GDP											
2017	100.0	95.3	54.2	20.4	20.5	10.0	6.4	4.1	0.3	4.7	-	-
	Chain-linked volumes (prices for the previous year)											
	quarter-on-quarter percentage changes											
2017 Q3	0.7	0.3	0.4	0.4	-0.1	1.2	2.2	-6.6	-	-	1.3	0.6
Q4	0.7	0.2	0.2	0.2	1.4	0.8	2.3	1.5	-	-	2.1	1.3
2018 Q1	0.4	0.6	0.5	0.1	0.3	0.9	-0.5	0.0	-	-	-0.7	-0.3
Q2	0.4	0.6	0.2	0.4	1.2	0.8	2.2	0.7	-	-	0.6	1.1
	annual percentage changes											
2015	2.1	2.4	1.8	1.3	4.8	0.5	5.4	15.3	-	-	6.5	7.7
2016	1.9	2.3	2.0	1.9	3.9	2.9	5.6	3.6	-	-	2.9	4.1
2017	2.4	1.7	1.6	1.1	2.5	3.7	5.0	-3.6	-	-	5.2	3.9
2017 Q3	2.8	2.0	1.9	1.3	2.4	4.0	5.8	-6.0	-	-	5.9	4.2
Q4	2.7	1.3	1.5	1.2	2.6	4.1	6.7	-6.8	-	-	6.5	3.7
2018 Q1	2.4	1.9	1.6	1.1	3.4	3.5	5.6	0.1	-	-	3.8	2.7
Q2	2.1	1.8	1.3	1.1	2.8	3.7	6.4	-4.5	-	-	3.2	2.7
	contributions to quarter-on-quarter percentage changes in GDP; percentage points											
2017 Q3	0.7	0.3	0.2	0.1	0.0	0.1	0.1	-0.3	0.1	0.3	-	-
Q4	0.7	0.2	0.1	0.0	0.3	0.1	0.2	0.1	-0.2	0.4	-	-
2018 Q1	0.4	0.6	0.3	0.0	0.1	0.1	0.0	0.0	0.2	-0.2	-	-
Q2	0.4	0.6	0.1	0.1	0.3	0.1	0.1	0.0	0.1	-0.2	-	-
	contributions to annual percentage changes in GDP; percentage points											
2015	2.1	2.3	1.0	0.3	0.9	0.0	0.3	0.6	0.0	-0.2	-	-
2016	1.9	2.2	1.1	0.4	0.8	0.3	0.3	0.2	0.0	-0.4	-	-
2017	2.4	1.6	0.9	0.2	0.5	0.4	0.3	-0.2	0.0	0.8	-	-
2017 Q3	2.8	1.9	1.0	0.3	0.5	0.4	0.4	-0.3	0.1	0.9	-	-
Q4	2.7	1.3	0.8	0.2	0.5	0.4	0.4	-0.3	-0.3	1.4	-	-
2018 Q1	2.4	1.8	0.9	0.2	0.7	0.3	0.3	0.0	0.0	0.6	-	-
Q2	2.1	1.7	0.7	0.2	0.6	0.4	0.4	-0.2	0.2	0.4	-	-

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	9,459.4	158.3	1,904.0	467.1	1,784.3	432.9	470.1	1,077.0	1,029.6	1,807.2	328.7	1,073.1
2016	9,697.5	156.0	1,958.5	484.2	1,829.8	449.3	462.2	1,100.0	1,070.0	1,853.2	334.4	1,111.9
2017	10,030.3	169.3	2,026.6	509.0	1,909.9	466.7	455.1	1,131.6	1,120.8	1,898.7	342.6	1,158.0
2017 Q3	2,523.8	42.6	511.6	128.3	480.4	117.7	114.1	284.2	282.1	476.7	86.2	290.4
Q4	2,546.9	42.9	519.0	130.4	484.5	118.5	113.9	285.8	285.2	480.0	86.5	294.2
2018 Q1	2,564.5	42.6	517.7	133.1	488.1	120.2	114.5	288.1	289.4	483.6	87.3	297.0
Q2	2,583.9	42.0	521.0	134.9	492.8	121.1	113.4	289.9	292.4	488.9	87.5	299.9
	as a percentage of value added											
2017	100.0	1.7	20.2	5.1	19.0	4.7	4.5	11.3	11.2	18.9	3.4	-
	Chain-linked volumes (prices for the previous year)											
	quarter-on-quarter percentage changes											
2017 Q3	0.7	0.1	1.5	0.5	0.5	1.6	-0.2	0.4	0.6	0.4	0.5	0.4
Q4	0.7	0.2	1.3	1.1	0.7	0.4	0.1	0.3	0.8	0.3	0.1	0.6
2018 Q1	0.4	1.4	-0.7	0.9	0.7	2.0	-0.3	0.5	0.9	0.5	0.4	0.4
Q2	0.4	0.2	0.2	0.6	0.5	0.6	0.2	0.1	0.7	0.3	0.1	0.5
	annual percentage changes											
2015	1.9	-1.4	3.9	0.6	2.2	3.4	-0.2	0.6	2.8	0.9	0.7	3.4
2016	1.8	-1.9	3.1	1.3	1.6	3.4	0.2	0.6	2.6	1.5	0.9	2.9
2017	2.4	1.4	2.9	2.9	3.2	4.6	-1.0	1.3	4.0	1.1	1.2	2.5
2017 Q3	2.9	1.3	4.3	3.3	3.7	4.9	-1.0	1.5	4.4	1.2	1.5	2.4
Q4	2.8	2.2	3.8	4.1	3.5	4.3	-0.5	1.4	4.5	1.1	1.3	2.2
2018 Q1	2.5	1.5	3.1	3.7	2.8	5.4	-0.2	1.5	3.3	1.6	1.5	1.8
Q2	2.1	1.9	2.3	3.1	2.5	4.6	-0.2	1.3	3.0	1.5	1.1	1.9
	contributions to quarter-on-quarter percentage changes in value added; percentage points											
2017 Q3	0.7	0.0	0.3	0.0	0.1	0.1	0.0	0.0	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	0.1	0.0	-
2018 Q1	0.4	0.0	-0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	-
Q2	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	-
	contributions to annual percentage changes in value added; percentage points											
2015	1.9	0.0	0.8	0.0	0.4	0.2	0.0	0.1	0.3	0.2	0.0	-
2016	1.8	0.0	0.6	0.1	0.3	0.2	0.0	0.1	0.3	0.3	0.0	-
2017	2.4	0.0	0.6	0.1	0.6	0.2	0.0	0.1	0.4	0.2	0.0	-
2017 Q3	2.9	0.0	0.9	0.2	0.7	0.2	0.0	0.2	0.5	0.2	0.1	-
Q4	2.8	0.0	0.8	0.2	0.7	0.2	0.0	0.2	0.5	0.2	0.0	-
2018 Q1	2.5	0.0	0.6	0.2	0.5	0.3	0.0	0.2	0.4	0.3	0.1	-
Q2	2.1	0.0	0.5	0.2	0.5	0.2	0.0	0.1	0.3	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	24.9	2.7	2.6	1.0	13.3	24.3	7.0
2016	100.0	85.4	14.6	3.3	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	1.3	-0.3	-1.1	0.1	0.1	1.4	1.5	-0.4	1.1	2.8	1.1	0.6
2016	1.4	1.6	-0.2	-0.1	0.8	-0.2	1.6	2.9	0.0	2.0	2.8	1.4	0.8
2017	1.6	2.0	-0.5	-0.3	1.2	1.8	1.7	3.1	-1.2	1.3	3.1	1.3	1.4
2017 Q3	1.7	2.1	-0.5	-1.2	1.4	2.0	1.8	2.9	-1.3	1.2	3.1	1.3	2.1
Q4	1.6	2.0	-0.5	-1.0	1.4	2.6	1.5	3.1	-1.6	1.7	3.4	1.3	1.1
2018 Q1	1.5	1.9	-0.7	-0.7	1.5	2.1	1.5	2.7	-1.0	2.0	3.2	1.3	0.6
Q2	1.5	1.8	-0.5	-0.4	1.5	2.4	1.2	2.5	-0.8	1.8	3.1	1.2	0.6
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	80.6	19.4	4.3	15.4	6.6	25.8	2.9	2.7	1.0	13.2	21.9	6.2
2017	100.0	81.0	19.0	4.2	15.3	6.7	25.8	3.0	2.6	1.0	13.4	21.8	6.2
annual percentage changes													
2015	1.2	1.4	0.1	-0.4	0.5	0.6	1.1	2.7	-0.2	1.4	2.9	1.2	1.1
2016	1.5	1.8	0.1	-0.2	0.9	0.1	1.7	2.5	0.7	2.4	3.0	1.4	1.0
2017	1.3	1.9	-0.9	-1.1	1.2	1.9	1.4	3.0	-1.5	1.6	3.0	1.1	0.8
2017 Q3	1.8	2.3	-0.5	-1.1	1.8	2.2	2.0	3.0	-1.2	1.1	3.4	1.2	1.6
Q4	1.8	2.4	-0.7	-0.7	2.1	3.6	1.5	3.0	-1.8	3.0	3.6	1.3	0.5
2018 Q1	1.4	2.0	-1.0	-0.9	1.7	2.1	1.2	2.4	-1.1	2.5	3.2	1.2	0.2
Q2	1.7	2.3	-0.7	-0.1	1.9	2.5	1.2	2.9	-0.4	1.4	3.6	1.5	1.1
Hours worked per person employed													
annual percentage changes													
2015	0.1	0.2	0.4	0.7	0.4	0.5	-0.3	1.1	0.1	0.2	0.2	0.0	0.5
2016	0.1	0.2	0.2	-0.1	0.1	0.3	0.1	-0.3	0.7	0.4	0.2	0.0	0.2
2017	-0.3	-0.1	-0.4	-0.8	0.0	0.0	-0.4	-0.2	-0.3	0.3	-0.1	-0.3	-0.6
2017 Q3	0.1	0.2	0.0	0.0	0.4	0.2	0.1	0.1	0.1	-0.1	0.3	-0.1	-0.5
Q4	0.1	0.4	-0.2	0.3	0.6	1.0	0.0	-0.1	-0.2	1.3	0.2	0.0	-0.6
2018 Q1	-0.1	0.1	-0.3	-0.3	0.2	0.0	-0.2	-0.3	-0.1	0.5	0.0	-0.1	-0.4
Q2	0.3	0.5	-0.3	0.4	0.4	0.1	0.0	0.4	0.4	-0.4	0.5	0.3	0.5

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	17.469	10.9	5.6	14.304	9.8	3.165	22.3	9.262	10.7	8.207	11.1		1.5
2016	162.012	4.3	16.254	10.0	5.0	13.289	9.0	2.964	20.9	8.483	9.7	7.771	10.4		1.7
2017	162.636	4.1	14.763	9.1	4.4	12.094	8.1	2.669	18.8	7.636	8.7	7.127	9.5		1.9
2017 Q3	163.319	4.0	14.602	9.0	4.2	11.962	8.0	2.640	18.5	7.568	8.6	7.034	9.3		1.9
Q4	163.108	3.9	14.205	8.7	4.2	11.645	7.8	2.560	17.9	7.326	8.4	6.879	9.1		2.0
2018 Q1	162.582	4.0	13.957	8.6	4.2	11.461	7.7	2.496	17.5	7.205	8.2	6.753	9.0		2.1
Q2	.	.	13.519	8.3	.	11.107	7.5	2.412	16.9	6.973	7.9	6.546	8.7		2.1
2018 Feb.	-	-	13.956	8.6	-	11.443	7.7	2.513	17.6	7.223	8.2	6.733	8.9		-
Mar.	-	-	13.814	8.5	-	11.355	7.6	2.459	17.2	7.124	8.1	6.691	8.9		-
Apr.	-	-	13.661	8.4	-	11.216	7.5	2.445	17.1	7.056	8.0	6.605	8.7		-
May	-	-	13.442	8.2	-	11.046	7.4	2.396	16.8	6.930	7.9	6.512	8.6		-
June	-	-	13.454	8.2	-	11.060	7.4	2.394	16.8	6.933	7.9	6.521	8.6		-
July	-	-	13.381	8.2	-	11.017	7.4	2.365	16.6	6.916	7.9	6.466	8.5		-

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	1.8	1.8	1.9	1.7	0.5	3.1	0.5	1.6	1.0	2.1	1.4	7.2
2017	3.0	3.2	3.7	3.9	1.4	1.3	2.9	7.9	2.3	1.4	3.3	0.9	5.6
2017 Q3	4.1	4.4	4.7	6.0	1.7	1.4	2.8	8.8	2.6	1.3	4.2	0.4	5.5
Q4	4.1	4.8	5.4	6.1	2.2	-0.5	2.8	9.5	2.1	0.9	3.1	0.1	6.3
2018 Q1	3.2	3.5	3.1	4.4	2.5	0.9	2.6	6.5	1.6	1.5	1.9	0.1	5.3
Q2	2.2	2.7	1.7	4.2	2.1	-2.3	2.5	4.1	1.6	1.1	2.2	0.6	3.2
2018 Feb.	2.7	2.3	2.6	2.0	2.0	5.1	0.0	5.7	1.8	1.9	1.9	0.7	4.8
Mar.	3.2	2.4	1.7	3.0	2.3	8.9	0.9	4.5	1.7	2.5	1.0	0.7	4.8
Apr.	1.7	2.0	0.8	4.1	1.0	-1.6	1.4	4.1	1.6	-0.4	3.5	0.6	2.7
May	2.6	3.1	2.5	4.0	3.0	-2.0	2.0	4.4	1.7	2.0	1.8	0.2	2.8
June	2.3	2.9	1.7	4.5	2.1	-3.4	2.6	3.6	1.5	1.8	1.3	1.0	3.9
July	-0.1	0.2	-0.1	1.4	-0.7	-2.1	.	.	1.1	1.4	0.9	1.3	.
	month-on-month percentage changes (s.a.)												
2018 Feb.	-0.8	-1.9	-0.8	-3.5	-1.1	7.0	-0.7	-0.6	0.3	1.1	-0.3	0.9	-0.7
Mar.	0.4	0.5	-0.2	-0.7	1.5	0.8	-0.2	-0.7	0.6	0.8	0.0	-0.1	-0.1
Apr.	-0.8	-0.2	-0.7	2.3	-1.6	-5.9	1.4	-0.5	-0.2	-1.4	1.7	-0.2	-1.9
May	1.4	1.5	1.7	0.7	2.8	0.3	0.3	1.7	0.3	1.3	-0.8	0.7	2.2
June	-0.8	-0.8	-0.5	-1.9	-1.1	-0.2	0.2	-1.3	0.3	0.5	-0.2	0.8	-0.6
July	-0.8	-0.7	-0.8	0.8	-1.3	0.7	.	.	-0.2	-0.6	0.4	-0.7	.

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 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
Q2	112.5	7.0	84.2	0.0	5.8	0.3	14.5	90.4	55.6	55.1	54.5	54.7
2018 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	6.9	-	0.2	7.1	0.7	14.4	-	55.5	54.8	53.8	54.1
June	112.3	6.9	-	-0.6	5.6	0.7	14.4	-	54.9	54.2	55.2	54.9
July	112.1	5.8	84.1	-0.5	5.4	0.3	15.3	90.6	55.1	54.4	54.2	54.3
Aug.	111.6	5.5	-	-1.9	6.4	1.7	14.7	-	54.6	54.7	54.4	54.5

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

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

	Households							Non-financial corporations					
	Saving ratio (gross) [1]	Debt ratio	Real gross disposable income	Financial investment	Non-financial investment (gross)	Net worth [2]	Housing wealth	Profit share [3]	Saving ratio (net)	Debt ratio [4]	Financial investment	Non-financial investment (gross)	Financing
	Percentage of gross disposable income (adjusted)		Annual percentage changes					Percentage of net value added		Percentage of GDP	Annual percentage changes		
	1	2	3	4	5	6	7	8	9	10	11	12	13
2015	12.5	94.1	1.6	2.0	1.4	3.0	1.8	33.9	7.2	136.0	4.6	9.3	2.5
2016	12.2	94.2	1.9	2.0	6.0	3.4	2.7	33.0	8.0	136.7	3.8	1.6	2.0
2017	12.0	94.0	1.3	2.0	6.7	5.0	5.5	33.9	7.7	133.8	3.6	7.0	2.0
2017 Q2	12.0	94.1	1.1	2.0	5.0	4.4	3.8	33.5	7.3	135.3	4.2	10.0	2.4
Q3	11.9	94.0	1.6	2.0	6.5	4.7	4.7	33.7	7.4	134.0	4.2	3.7	2.4
Q4	12.0	94.0	1.5	2.0	6.5	5.0	5.5	33.9	7.7	133.8	3.6	3.6	2.0
2018 Q1	12.0	93.7	1.9	1.9	5.7	4.6	5.8	33.9	7.8	133.7	2.8	1.6	1.4

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 Q3	988.9	873.2	115.7	575.6	482.9	214.5	186.3	171.9	138.5	26.9	65.4	7.1	8.4
Q4	996.3	893.9	102.4	590.1	496.3	218.0	190.2	160.1	144.8	28.0	62.5	12.1	10.4
2018 Q1	985.5	874.4	111.1	579.7	489.2	213.5	186.1	164.0	139.5	28.3	59.6	9.1	6.4
Q2	987.1	909.9	77.2	578.4	511.6	215.5	187.9	166.6	148.9	26.6	61.5	7.3	6.1
2018 Jan.	328.1	291.9	36.3	197.1	166.5	71.1	61.6	50.8	44.7	9.2	19.1	3.0	1.9
Feb.	327.1	288.3	38.8	190.7	161.2	70.6	61.6	56.9	48.3	8.9	17.2	2.2	1.6
Mar.	330.2	294.2	36.0	191.9	161.5	71.8	62.9	56.3	46.4	10.2	23.3	3.9	2.9
Apr.	328.7	299.4	29.3	189.9	168.2	72.1	62.4	57.6	48.8	9.1	20.0	2.1	2.0
May	329.1	304.7	24.4	192.2	170.4	72.3	63.4	55.5	52.1	9.0	18.9	2.3	2.1
June	329.3	305.7	23.5	196.2	173.0	71.1	62.2	53.5	48.0	8.5	22.6	2.9	1.9
12-month cumulated transactions													
2018 June	3,957.7	3,551.4	406.3	2,323.7	1,980.0	861.5	750.6	662.5	571.8	109.9	249.0	35.6	31.2
12-month cumulated transactions as a percentage of GDP													
2018 June	34.7	31.2	3.6	20.4	17.4	7.6	6.6	5.8	5.0	1.0	2.2	0.3	0.3

1) The capital account is not seasonally adjusted.

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

(seasonally adjusted, unless otherwise indicated)

	Total (n.s.a.)		Exports (f.o.b.)					Imports (c.i.f.)					
			Total				Memo item:	Total				Memo items:	
	Exports	Imports		Intermediate goods	Capital goods	Consump-tion goods	Manu-facturing		Intermediate goods	Capital goods	Consump-tion goods	Manu-facturing	Oil
	1	2	3	4	5	6	7	8	9	10	11	12	13
Values (EUR billions; annual percentage changes for columns 1 and 2)													
2017 Q3	6.0	8.0	546.8	257.0	114.6	164.1	459.7	485.9	272.9	81.0	123.1	355.1	48.5
Q4	6.1	7.7	561.7	268.2	116.0	167.0	471.3	501.2	285.2	81.4	125.5	360.7	58.7
2018 Q1	2.1	1.9	560.7	269.7	113.5	168.1	469.5	503.6	291.1	81.1	123.4	356.8	65.0
Q2	4.2	5.7	566.0	.	.	.	472.6	514.6	.	.	.	361.0	.
2018 Jan.	9.1	6.2	190.3	92.8	38.2	56.6	158.8	170.9	98.7	27.7	41.7	120.7	23.1
Feb.	1.8	1.7	183.9	88.6	37.4	54.7	153.9	165.8	96.3	26.1	40.2	117.4	21.5
Mar.	-3.2	-2.0	186.5	88.3	38.0	56.8	156.8	166.9	96.0	27.3	41.4	118.7	20.3
Apr.	8.2	8.5	187.4	88.7	39.2	55.4	156.6	169.7	98.6	26.0	42.5	119.6	21.1
May	-0.9	0.6	187.8	89.9	38.0	55.0	157.4	170.9	99.3	26.5	41.9	121.7	21.4
June	5.7	8.5	190.8	.	.	.	158.5	174.0	.	.	.	119.7	.
Volume indices (2000 = 100; annual percentage changes for columns 1 and 2)													
2017 Q3	3.7	3.4	123.7	121.8	124.8	127.9	124.0	114.2	113.9	115.8	114.1	117.9	100.2
Q4	4.4	4.1	126.3	125.8	125.8	130.2	126.8	114.8	114.7	113.3	115.7	118.5	105.9
2018 Q1	2.3	1.9	125.7	125.4	123.1	131.6	126.2	114.2	114.7	112.3	114.8	117.0	110.3
Q2	.	.	.	.	.	.	.	.	.	.	.	.	.
2017 Dec.	-0.3	0.0	128.8	127.6	130.2	132.6	129.9	114.0	115.1	106.9	114.3	117.4	111.2
2018 Jan.	8.6	5.1	127.5	129.0	123.5	132.6	127.7	114.6	115.4	112.4	114.7	117.2	114.1
Feb.	2.2	2.4	124.1	124.0	122.1	128.3	124.3	113.5	114.4	110.6	112.8	116.3	110.4
Mar.	-2.5	-1.5	125.7	123.2	123.6	133.8	126.5	114.4	114.4	114.0	116.9	117.5	106.3
Apr.	8.2	7.4	125.8	123.2	127.2	130.1	125.9	114.7	115.8	106.4	118.8	117.2	104.6
May	-1.3	-2.0	125.3	124.3	123.3	127.5	126.1	115.3	115.1	111.6	117.9	120.2	99.6

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 Q3	101.8	1.4	1.2	1.4	1.5	0.2	0.7	0.3	0.1	-0.9	0.3	1.5	1.1
Q4	102.4	1.4	0.9	1.6	1.2	0.5	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
Q2	103.7	1.7	0.9	2.0	1.3	0.5	0.8	0.7	0.0	1.9	0.5	1.7	1.6
2018 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	1.3	0.8	1.4	1.0	0.1	0.3	0.2	0.0	0.8	0.0	1.2	1.6
May	103.8	1.9	1.1	2.1	1.6	0.4	0.0	0.7	0.0	2.2	0.3	1.9	1.6
June	104.0	2.0	0.9	2.5	1.3	0.2	0.2	0.1	0.1	0.9	0.0	2.0	1.6
July	103.6	2.1	1.1	2.8	1.4	0.2	0.1	0.0	0.1	0.7	0.2	2.1	2.4
Aug. [3)]	103.8	2.0	1.0	.	1.3	0.1	0.2	0.4	0.0	0.4	0.0	.	.

	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 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
Q2	2.6	2.7	2.3	1.7	0.3	5.5	1.2	1.2	1.3	-0.7	1.8	1.3
2018 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	2.5	2.6	2.4	1.8	0.3	6.1	1.3	1.3	1.7	-0.6	2.5	1.3
June	2.7	2.6	2.9	2.4	0.4	8.0	1.1	1.0	1.5	-0.8	1.7	1.3
July	2.5	2.4	2.6	2.9	0.5	9.5	1.1	1.1	1.3	-0.6	2.1	1.4
Aug. [3)]	2.5	2.4	2.5	.	0.3	9.2	.	.	.	.	.	.

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	1.7	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	3.4	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	3.7	5.1
2017 Q3	100.5	2.4	2.7	2.1	3.0	1.0	2.2	3.1	0.2	3.3	1.9	3.7	5.7
Q4	101.7	2.5	2.5	2.0	3.2	0.9	1.6	2.0	0.3	3.8	2.4	3.9	6.6
2018 Q1	102.5	1.8	1.7	1.6	2.4	1.0	0.9	1.1	0.5	2.2	2.3	4.3	.
Q2	103.2	2.8	2.7	1.4	2.5	1.0	0.4	0.2	0.5	6.9	.	.	.
2018 Feb.	102.5	1.7	1.4	1.6	2.4	1.0	0.8	1.0	0.5	1.9	-	-	-
Mar.	102.5	2.0	1.7	1.4	2.2	1.0	0.9	1.2	0.5	3.6	-	-	-
Apr.	102.5	1.9	1.8	1.3	2.1	1.0	0.5	0.4	0.4	3.5	-	-	-
May	103.3	3.0	2.9	1.4	2.4	1.0	0.4	0.1	0.5	7.7	-	-	-
June	103.7	3.6	3.4	1.6	3.0	1.1	0.2	0.0	0.5	9.5	-	-	-
July	104.1	4.0	3.4	1.7	3.2	1.1	0.1	-0.3	0.6	10.7	-	-	-

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	0.5	0.8	0.4	-1.9	47.1	0.0	4.2	-4.5	2.9	7.0	-2.7
2016	106.8	0.7	0.4	0.3	0.4	0.7	-1.4	-2.4	39.9	-3.7	-4.0	-3.3	-7.4	-10.4	-3.0
2017	107.9	1.1	1.5	1.5	1.3	1.5	1.8	2.9	48.1	5.9	-3.5	16.4	5.5	-3.2	17.5
2017 Q3	108.2	1.3	1.6	1.4	1.3	1.5	1.4	2.0	44.0	2.0	-7.4	12.3	2.7	-5.7	13.5
Q4	108.5	1.3	1.6	1.4	1.5	1.6	1.2	1.8	52.2	-2.5	-9.5	4.6	0.0	-5.2	6.3
2018 Q1	108.8	1.5	1.4	1.2	1.4	1.7	0.4	0.3	54.6	-8.9	-14.5	-3.6	-7.6	-12.6	-1.9
Q2	109.3	1.4	1.6	1.5	1.8	1.9	1.1	1.6	62.6	1.6	-6.5	9.6	1.2	-7.1	10.9
2018 Mar.	-	-	-	-	-	-	-	-	53.9	-9.3	-12.8	-6.0	-8.8	-12.3	-4.8
Apr.	-	-	-	-	-	-	-	-	58.4	-4.9	-10.2	0.1	-5.2	-11.1	1.5
May	-	-	-	-	-	-	-	-	64.9	3.9	-4.8	12.6	3.2	-5.8	13.8
June	-	-	-	-	-	-	-	-	64.4	6.2	-4.6	17.0	5.8	-4.2	18.0
July	-	-	-	-	-	-	-	-	63.7	1.6	-6.3	9.7	2.5	-4.4	11.2
Aug.	-	-	-	-	-	-	-	-	63.3	2.6	-1.8	6.5	4.8	1.9	8.1

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 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
Q2	9.8	6.7	9.0	12.2	18.5	65.6	57.6	56.5	52.3
2018 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	9.0	14.3	18.0	65.3	57.6	56.4	52.0
June	10.1	6.8	9.0	12.5	21.1	67.6	58.6	55.7	53.2
July	9.6	6.8	9.0	12.3	20.7	66.6	57.9	55.6	53.0
Aug.	10.3	7.8	9.2	13.0	19.6	65.3	58.1	55.1	52.7

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	2.0	0.7	1.6	1.6	1.5
2016	105.8	1.5	1.5	1.6	1.4	1.6	1.4
2017	107.5	1.6	1.7	1.2	1.7	1.4	1.5
2017 Q3	104.2	1.6	1.6	1.4	1.8	1.0	1.5
Q4	114.0	1.4	1.5	0.8	1.6	0.9	1.5
2018 Q1	102.5	2.0	1.8	2.6	2.4	1.1	1.7
Q2	.	.	.	.	.	.	2.2

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	104.7	0.5	1.5	-1.6	0.8	0.6	0.9	0.7	2.6	1.6	1.3	1.8
2016	105.4	0.7	2.3	-1.1	0.0	1.4	-0.3	2.0	3.8	0.9	1.2	1.8
2017	106.2	0.8	-0.1	-0.2	0.1	0.0	0.2	0.3	4.4	2.2	1.5	1.6
2017 Q3	106.2	0.4	-0.4	-1.4	-0.5	0.0	0.3	0.1	4.2	2.2	1.3	1.5
Q4	106.6	0.7	-0.9	-0.5	0.1	-0.3	0.7	-0.4	4.6	2.2	1.7	1.5
2018 Q1	107.0	1.0	0.6	0.0	-0.5	0.7	-0.1	1.0	4.0	2.2	1.6	1.2
Q2	107.8	1.7	0.3	1.5	0.8	1.0	0.7	1.1	3.8	2.9	2.0	1.8
Compensation per employee												
2015	108.1	1.5	1.3	2.1	1.3	1.4	2.7	0.9	2.1	1.6	1.2	1.9
2016	109.4	1.2	0.4	1.1	1.5	1.3	0.2	2.2	2.4	0.7	1.3	1.9
2017	111.1	1.5	1.5	1.5	1.1	1.5	1.6	0.6	4.3	3.2	1.3	1.4
2017 Q3	111.4	1.6	2.0	1.4	0.8	1.8	2.3	0.3	4.4	3.4	1.2	0.8
Q4	112.1	1.8	2.3	1.9	1.6	1.7	1.9	0.7	4.3	3.2	1.5	1.7
2018 Q1	112.6	1.9	2.8	1.6	1.1	2.0	2.6	1.9	3.5	2.4	1.9	2.2
Q2	113.4	2.3	2.6	2.3	1.4	2.2	2.8	1.7	3.3	2.8	2.3	2.4
Labour productivity per person employed												
2015	103.3	1.0	-0.3	3.7	0.5	0.8	1.8	0.2	-0.6	0.1	-0.2	0.1
2016	103.8	0.5	-1.8	2.3	1.5	-0.1	0.5	0.2	-1.4	-0.2	0.1	0.1
2017	104.6	0.8	1.7	1.7	1.1	1.5	1.4	0.3	-0.1	0.9	-0.2	-0.3
2017 Q3	104.9	1.1	2.5	2.9	1.3	1.8	1.9	0.3	0.2	1.3	-0.1	-0.6
Q4	105.2	1.1	3.2	2.4	1.5	2.0	1.1	1.1	-0.2	1.0	-0.2	0.2
2018 Q1	105.2	0.9	2.2	1.5	1.6	1.3	2.7	0.8	-0.5	0.2	0.3	0.9
Q2	105.2	0.6	2.4	0.7	0.6	1.2	2.1	0.6	-0.5	-0.1	0.3	0.6
Compensation per hour worked												
2015	109.8	1.3	1.4	1.7	0.7	1.5	1.5	0.8	1.5	1.2	1.2	1.6
2016	111.0	1.0	0.0	1.0	1.5	1.0	0.5	1.6	2.2	0.3	1.4	1.7
2017	112.8	1.6	1.2	1.5	0.9	1.7	1.5	0.8	3.6	3.0	1.6	1.7
2017 Q3	112.6	1.3	0.3	0.9	0.0	1.6	1.9	0.1	3.6	2.9	1.3	1.1
Q4	113.4	1.4	1.2	1.1	0.7	1.4	1.7	0.6	2.2	2.8	1.4	1.9
2018 Q1	113.9	1.8	2.6	1.3	0.6	2.0	2.8	2.1	2.5	2.2	1.9	2.1
Q2	114.4	1.8	0.5	1.8	0.9	1.9	2.2	1.3	3.0	2.3	2.0	1.1
Hourly labour productivity												
2015	105.2	0.9	-1.0	3.3	0.0	1.1	0.7	0.1	-0.8	-0.1	-0.2	-0.4
2016	105.7	0.4	-1.7	2.2	1.2	-0.2	0.9	-0.5	-1.8	-0.4	0.1	-0.1
2017	106.7	1.0	2.5	1.7	1.0	1.9	1.6	0.6	-0.4	1.0	0.1	0.4
2017 Q3	106.6	1.0	2.4	2.4	1.1	1.7	1.9	0.1	0.3	1.0	0.0	-0.1
Q4	107.1	0.9	2.9	1.8	0.5	2.0	1.2	1.3	-1.5	0.8	-0.2	0.8
2018 Q1	107.2	1.0	2.4	1.4	1.5	1.5	3.0	1.0	-1.0	0.2	0.4	1.3
Q2	106.9	0.4	2.0	0.3	0.5	1.2	1.7	0.2	-0.1	-0.6	0.0	0.0

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	1,075.5	6,083.9	7,159.4	1,329.8	2,221.2	3,551.0	10,710.4	70.4	523.2	91.7	685.2	11,395.7
2017	1,112.0	6,635.7	7,747.7	1,194.4	2,261.2	3,455.6	11,203.3	75.7	509.4	75.8	660.8	11,864.1
2017 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	6,635.7	7,747.7	1,194.4	2,261.2	3,455.6	11,203.3	75.7	509.4	75.8	660.8	11,864.1
2018 Q1	1,113.4	6,746.1	7,859.5	1,171.5	2,258.5	3,430.0	11,289.5	71.6	505.7	74.6	651.9	11,941.4
Q2	1,133.3	6,906.2	8,039.5	1,183.4	2,269.8	3,453.2	11,492.7	73.9	506.7	69.2	649.8	12,142.5
2018 Feb.	1,115.6	6,720.6	7,836.1	1,178.4	2,258.0	3,436.4	11,272.5	72.8	502.5	63.0	638.3	11,910.8
Mar.	1,113.4	6,746.1	7,859.5	1,171.5	2,258.5	3,430.0	11,289.5	71.6	505.7	74.6	651.9	11,941.4
Apr.	1,122.2	6,759.0	7,881.2	1,158.9	2,263.4	3,422.3	11,303.5	77.4	510.6	75.3	663.3	11,966.7
May	1,128.3	6,850.3	7,978.6	1,163.1	2,265.3	3,428.4	11,407.0	71.3	504.4	65.1	640.8	12,047.8
June	1,133.3	6,906.2	8,039.5	1,183.4	2,269.8	3,453.2	11,492.7	73.9	506.7	69.2	649.8	12,142.5
July [p)]	1,136.5	6,913.5	8,050.0	1,158.2	2,277.5	3,435.7	11,485.7	67.0	511.4	65.6	644.0	12,129.7
Transactions												
2015	66.5	566.9	633.3	-134.5	12.3	-122.2	511.2	-47.4	49.7	-27.2	-24.9	486.2
2016	37.9	541.7	579.6	-105.4	16.0	-89.3	490.3	-4.2	38.0	16.9	50.7	541.0
2017	36.6	588.3	624.9	-112.3	36.3	-76.0	548.9	6.7	-13.7	-19.1	-26.0	522.8
2017 Q3	9.4	157.0	166.4	-32.9	10.8	-22.1	144.3	-1.1	16.8	3.1	18.9	163.1
Q4	7.2	109.0	116.2	-21.6	9.9	-11.7	104.5	9.4	-21.4	-5.9	-17.9	86.7
2018 Q1	1.4	107.2	108.6	-21.2	5.9	-15.3	93.3	-3.9	-3.6	-0.2	-7.6	85.7
Q2	19.9	149.5	169.4	8.6	10.6	19.2	188.6	-0.9	1.3	-7.2	-6.8	181.8
2018 Feb.	1.1	30.1	31.2	-21.1	1.1	-20.1	11.1	-2.1	-12.1	0.6	-13.6	-2.5
Mar.	-2.2	27.2	25.1	-6.3	0.6	-5.7	19.3	-1.2	3.4	12.3	14.6	33.9
Apr.	8.8	9.6	18.4	-13.3	4.9	-8.4	10.0	3.0	4.8	0.2	8.0	18.0
May	6.2	84.8	90.9	1.4	1.5	2.9	93.8	-6.6	-6.1	-11.1	-23.8	70.0
June	5.0	55.2	60.2	20.6	4.1	24.7	84.8	2.7	2.6	3.8	9.0	93.9
July [p)]	2.1	8.2	10.3	-24.2	7.7	-16.5	-6.2	-6.8	4.5	-3.3	-5.7	-11.9
Growth rates												
2015	6.8	11.3	10.6	-8.5	0.6	-3.3	5.3	-38.9	11.4	-25.4	-3.8	4.7
2016	3.7	9.7	8.8	-7.3	0.7	-2.5	4.8	-5.7	7.8	22.2	8.0	5.0
2017	3.4	9.7	8.7	-8.5	1.6	-2.1	5.1	9.7	-2.6	-20.9	-3.8	4.6
2017 Q3	3.6	11.0	9.9	-10.4	1.4	-3.2	5.4	-13.2	5.6	-10.8	1.3	5.2
Q4	3.4	9.7	8.7	-8.5	1.6	-2.1	5.1	9.7	-2.6	-20.9	-3.8	4.6
2018 Q1	2.4	8.5	7.6	-8.7	1.7	-2.1	4.4	-1.6	-4.8	-23.3	-7.0	3.7
Q2	3.5	8.2	7.5	-5.3	1.7	-0.9	4.8	5.2	-1.3	-13.0	-2.0	4.5
2018 Feb.	2.8	9.4	8.4	-9.3	1.8	-2.3	4.9	7.7	-2.3	-32.4	-5.4	4.3
Mar.	2.4	8.5	7.6	-8.7	1.7	-2.1	4.4	-1.6	-4.8	-23.3	-7.0	3.7
Apr.	2.8	7.8	7.0	-8.4	1.8	-1.9	4.2	5.3	-1.7	-5.4	-1.4	3.8
May	3.2	8.3	7.5	-7.6	1.7	-1.7	4.6	-3.6	-2.9	-20.9	-5.1	4.0
June	3.5	8.2	7.5	-5.3	1.7	-0.9	4.8	5.2	-1.3	-13.0	-2.0	4.5
July [p)]	3.6	7.5	6.9	-6.5	1.9	-1.1	4.4	-2.1	-1.3	-16.1	-3.1	4.0

Source: ECB.

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

5 Money and credit

5.2 Deposits in M3 [1]

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

	Non-financial corporations [2]					Households [3]					Financial corporations other than MFIs and ICPFs [2]	Insurance corporations and pension funds	Other general government [4]
	Total	Overnight	With an agreed maturity of up to 2 years	Redeemable at notice of up to 3 months	Repos	Total	Overnight	With an agreed maturity of up to 2 years	Redeemable at notice of up to 3 months	Repos			
	1	2	3	4	5	6	7	8	9	10	11	12	13
Outstanding amounts													
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	2,082.5	1,617.4	296.5	160.3	8.4	6,052.3	3,400.9	644.8	2,004.7	1.9	989.1	198.2	383.2
2017	2,244.0	1,787.8	287.1	159.7	9.5	6,300.9	3,696.7	561.5	2,042.0	0.6	1,009.9	202.2	409.9
2017 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	2,244.0	1,787.8	287.1	159.7	9.5	6,300.9	3,696.7	561.5	2,042.0	0.6	1,009.9	202.2	409.9
2018 Q1	2,258.6	1,820.7	273.3	157.1	7.6	6,375.2	3,788.4	542.8	2,042.5	1.5	991.1	209.5	413.2
Q2	2,298.7	1,856.8	278.6	156.4	6.9	6,462.8	3,870.2	535.9	2,055.7	1.0	1,025.1	220.7	425.9
2018 Feb.	2,267.3	1,813.5	287.0	157.9	8.9	6,359.5	3,767.5	548.7	2,041.5	1.8	981.3	207.9	413.8
Mar.	2,258.6	1,820.7	273.3	157.1	7.6	6,375.2	3,788.4	542.8	2,042.5	1.5	991.1	209.5	413.2
Apr.	2,270.1	1,837.6	269.5	155.4	7.7	6,406.2	3,815.3	539.4	2,049.7	1.8	953.2	211.5	417.7
May	2,296.2	1,863.5	269.9	156.2	6.7	6,432.8	3,843.0	536.6	2,051.9	1.3	985.2	217.7	418.1
June	2,298.7	1,856.8	278.6	156.4	6.9	6,462.8	3,870.2	535.9	2,055.7	1.0	1,025.1	220.7	425.9
July [p]	2,295.5	1,861.9	270.1	156.1	7.4	6,490.9	3,893.5	533.1	2,062.5	1.8	990.3	216.7	422.7
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	128.2	151.8	-24.0	0.2	0.2	299.8	333.3	-46.3	13.7	-0.8	30.9	-29.6	18.8
2017	178.2	180.4	-3.2	-0.2	1.1	253.9	303.7	-81.9	33.4	-1.3	54.1	5.9	26.9
2017 Q3	34.8	41.7	-6.0	0.3	-1.1	65.9	75.1	-16.8	8.0	-0.3	12.2	4.8	16.1
Q4	23.2	16.4	1.2	1.4	4.2	47.6	65.2	-21.8	5.5	-1.3	42.6	2.2	-8.9
2018 Q1	17.4	34.9	-12.9	-2.7	-1.9	76.6	84.8	-18.4	9.4	0.9	-16.8	7.6	3.2
Q2	32.6	31.6	2.6	-0.8	-0.7	85.3	80.9	-7.8	12.6	-0.5	26.8	10.8	12.3
2018 Feb.	-18.4	-11.4	-5.5	0.3	-1.7	28.9	35.0	-7.6	1.4	0.1	-7.5	3.9	1.0
Mar.	-7.7	7.8	-13.5	-0.8	-1.3	16.2	21.1	-5.8	1.1	-0.3	10.4	2.1	-0.6
Apr.	9.5	15.5	-4.4	-1.7	0.1	30.2	26.5	-3.8	7.1	0.3	-41.7	1.8	4.4
May	21.4	23.4	-1.8	0.8	-1.0	25.0	27.3	-3.6	1.9	-0.5	28.5	5.9	0.2
June	1.7	-7.3	8.7	0.1	0.2	30.1	27.1	-0.4	3.6	-0.3	39.9	3.1	7.7
July [p]	-2.1	5.9	-8.2	-0.3	0.5	28.4	23.5	-2.6	6.8	0.7	-34.4	-3.9	-3.2
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	-1.1	-0.1	13.8	4.2	8.9	-12.7	1.7	-65.9	5.6	3.0	7.0
2017 Q3	8.1	12.2	-7.4	-1.8	-42.3	4.6	9.9	-12.5	1.6	-25.3	5.7	-2.0	8.9
Q4	8.6	11.2	-1.1	-0.1	13.8	4.2	8.9	-12.7	1.7	-65.9	5.6	3.0	7.0
2018 Q1	5.3	8.1	-7.6	-0.2	17.9	4.0	8.3	-12.5	1.6	-42.2	5.4	10.4	5.4
Q2	4.9	7.2	-5.2	-1.2	6.8	4.5	8.6	-10.8	1.8	-54.2	6.7	13.0	5.6
2018 Feb.	6.7	9.0	-2.9	0.1	31.1	4.2	8.7	-12.5	1.7	-33.3	7.0	6.0	5.7
Mar.	5.3	8.1	-7.6	-0.2	17.9	4.0	8.3	-12.5	1.6	-42.2	5.4	10.4	5.4
Apr.	5.5	8.3	-7.6	-0.6	13.4	4.2	8.4	-12.0	1.8	-40.6	1.6	7.2	5.0
May	5.7	8.7	-8.2	-0.9	7.1	4.2	8.5	-11.7	1.7	-48.3	3.7	11.6	4.5
June	4.9	7.2	-5.2	-1.2	6.8	4.5	8.6	-10.8	1.8	-54.2	6.7	13.0	5.6
July [p]	4.4	6.8	-7.1	-1.0	20.6	4.7	8.7	-10.4	2.0	-13.9	1.9	11.8	3.2

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	3,901.4	1,113.6	2,785.4	12,599.6	10,509.4	10,804.8	4,285.9	5,310.8	789.0	123.8	1,307.8	782.4
2016	4,393.8	1,083.6	3,297.1	12,877.2	10,707.8	10,978.8	4,310.1	5,449.0	836.0	112.7	1,385.4	784.0
2017	4,631.3	1,032.7	3,584.7	13,112.9	10,871.3	11,168.3	4,324.9	5,598.1	839.6	108.7	1,440.1	801.5
2017 Q3	4,548.3	1,050.5	3,483.6	13,048.9	10,816.0	11,103.5	4,302.2	5,556.2	845.6	111.9	1,439.0	794.0
Q4	4,631.3	1,032.7	3,584.7	13,112.9	10,871.3	11,168.3	4,324.9	5,598.1	839.6	108.7	1,440.1	801.5
2018 Q1	4,600.7	1,021.7	3,565.2	13,196.1	10,945.8	11,232.8	4,344.9	5,631.8	857.1	112.0	1,466.4	783.9
Q2	4,599.8	1,017.9	3,567.6	13,280.1	10,995.9	11,332.4	4,354.8	5,659.7	861.1	120.3	1,497.2	787.0
2018 Feb.	4,598.6	1,023.6	3,560.7	13,188.5	10,936.3	11,224.7	4,349.3	5,615.1	858.1	113.8	1,459.5	792.8
Mar.	4,600.7	1,021.7	3,565.2	13,196.1	10,945.8	11,232.8	4,344.9	5,631.8	857.1	112.0	1,466.4	783.9
Apr.	4,594.5	1,021.6	3,559.0	13,252.6	10,964.5	11,256.1	4,358.6	5,644.5	843.4	117.9	1,484.3	803.8
May	4,576.9	1,023.3	3,539.3	13,302.0	11,010.0	11,302.0	4,384.5	5,650.5	854.4	120.6	1,490.5	801.5
June	4,599.8	1,017.9	3,567.6	13,280.1	10,995.9	11,332.4	4,354.8	5,659.7	861.1	120.3	1,497.2	787.0
July [p)]	4,618.4	1,010.4	3,593.8	13,333.9	11,024.8	11,351.2	4,382.6	5,676.9	844.8	120.6	1,520.0	789.0
Transactions												
2015	295.0	-21.3	316.0	83.8	56.7	76.4	-16.6	101.2	-22.2	-5.7	25.6	1.5
2016	487.4	-34.5	521.8	317.6	233.9	257.9	82.4	119.7	42.9	-11.1	79.7	4.0
2017	290.6	-43.1	333.1	361.2	272.1	315.5	82.4	173.0	20.4	-3.7	64.2	24.8
2017 Q3	88.7	-10.8	99.6	74.2	75.9	86.8	21.4	40.6	14.5	-0.7	2.3	-4.0
Q4	90.1	-15.8	105.8	87.6	74.9	92.3	33.6	48.3	-3.8	-3.2	5.9	6.8
2018 Q1	-39.9	-10.2	-29.7	115.6	101.9	97.6	39.7	39.2	19.7	3.4	28.9	-15.2
Q2	35.5	-4.3	39.5	89.0	55.4	108.5	14.2	36.0	-2.9	8.1	31.2	2.4
2018 Feb.	3.1	-7.5	10.5	2.1	0.7	-3.3	-4.0	10.4	-7.0	1.3	6.6	-5.1
Mar.	-12.8	-2.0	-10.4	29.4	30.2	31.6	11.9	20.8	-0.8	-1.7	7.5	-8.3
Apr.	-4.0	-0.1	-3.9	46.2	13.9	17.9	13.6	12.2	-17.7	5.8	17.6	14.7
May	25.9	1.3	24.3	56.3	48.5	51.9	26.7	11.2	8.1	2.6	6.2	1.5
June	13.6	-5.5	19.1	-13.5	-7.0	38.6	-26.1	12.6	6.8	-0.2	7.3	-13.8
July [p)]	26.6	-6.1	32.7	57.5	35.2	25.0	30.4	19.1	-14.5	0.2	22.8	-0.5
Growth rates												
2015	8.2	-1.9	12.8	0.7	0.5	0.7	-0.4	1.9	-2.7	-4.4	2.0	0.2
2016	12.4	-3.1	18.7	2.5	2.2	2.4	1.9	2.3	5.5	-8.9	6.1	0.5
2017	6.7	-4.0	10.2	2.8	2.6	2.9	1.9	3.2	2.5	-3.3	4.6	3.2
2017 Q3	8.3	-4.0	12.7	2.8	2.4	2.7	1.5	3.0	3.5	2.0	5.7	2.6
Q4	6.7	-4.0	10.2	2.8	2.6	2.9	1.9	3.2	2.5	-3.3	4.6	3.2
2018 Q1	3.9	-4.0	6.4	2.6	2.6	3.0	2.2	3.0	2.3	-0.4	4.0	-0.1
Q2	3.9	-3.9	6.4	2.8	2.9	3.5	2.5	3.0	3.3	6.8	4.8	-1.3
2018 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	2.3	-0.4	4.0	-0.1
Apr.	3.2	-4.0	5.5	2.9	2.7	3.1	2.4	3.0	2.7	3.7	5.2	1.9
May	3.4	-3.6	5.6	3.2	3.1	3.3	2.8	3.1	3.8	8.1	4.6	2.0
June	3.9	-3.9	6.4	2.8	2.9	3.5	2.5	3.0	3.3	6.8	4.8	-1.3
July [p)]	3.7	-3.9	6.1	3.0	3.0	3.4	3.0	3.3	1.2	5.6	5.0	-1.0

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	4,285.9	4,268.5	1,041.5	760.8	2,483.6	5,310.8	5,643.8	595.9	3,949.4	765.5
2016	4,310.1	4,309.7	1,001.9	796.5	2,511.7	5,449.0	5,728.9	615.9	4,083.2	749.9
2017	4,324.9	4,364.5	977.1	820.3	2,527.4	5,598.1	5,865.8	653.1	4,215.6	729.3
2017 Q3	4,302.2	4,323.5	977.5	811.7	2,513.0	5,556.2	5,830.5	644.9	4,178.9	732.5
Q4	4,324.9	4,364.5	977.1	820.3	2,527.4	5,598.1	5,865.8	653.1	4,215.6	729.3
2018 Q1	4,344.9	4,380.1	1,001.5	819.8	2,523.5	5,631.8	5,905.2	663.0	4,242.3	726.5
Q2	4,354.8	4,421.9	986.4	827.9	2,540.5	5,659.7	5,941.3	670.1	4,273.8	715.8
2018 Feb.	4,349.3	4,381.6	988.9	824.3	2,536.1	5,615.1	5,892.3	662.2	4,225.3	727.6
Mar.	4,344.9	4,380.1	1,001.5	819.8	2,523.5	5,631.8	5,905.2	663.0	4,242.3	726.5
Apr.	4,358.6	4,393.3	1,004.9	821.5	2,532.2	5,644.5	5,919.2	668.3	4,250.1	726.2
May	4,384.5	4,415.4	1,012.6	823.9	2,548.0	5,650.5	5,927.8	670.1	4,257.6	722.8
June	4,354.8	4,421.9	986.4	827.9	2,540.5	5,659.7	5,941.3	670.1	4,273.8	715.8
July [p)]	4,382.6	4,442.5	998.0	832.8	2,551.9	5,676.9	5,955.7	675.1	4,286.6	715.2
Transactions										
2015	-16.6	20.7	-62.4	31.8	14.0	101.2	79.3	22.7	80.2	-1.8
2016	82.4	99.6	-15.8	44.0	54.3	119.7	113.8	23.5	105.4	-9.3
2017	82.4	132.9	0.7	37.1	44.6	173.0	165.8	44.0	134.2	-5.1
2017 Q3	21.4	33.3	-5.9	16.9	10.4	40.6	36.0	10.9	33.3	-3.6
Q4	33.6	56.6	3.4	10.8	19.5	48.3	45.8	11.7	36.8	-0.1
2018 Q1	39.7	38.2	30.1	4.9	4.8	39.2	45.9	11.7	26.7	0.8
Q2	14.2	47.8	-15.3	11.4	18.1	36.0	44.4	11.1	30.8	-5.9
2018 Feb.	-4.0	-3.6	-8.5	-1.9	6.4	10.4	12.3	3.2	7.4	-0.1
Mar.	11.9	16.8	17.1	-0.4	-4.8	20.8	17.2	2.4	17.9	0.5
Apr.	13.6	13.0	3.4	1.5	8.7	12.2	13.6	4.5	7.9	-0.2
May	26.7	25.3	6.0	5.3	15.5	11.2	14.4	5.4	6.2	-0.4
June	-26.1	9.5	-24.7	4.7	-6.1	12.6	16.4	1.3	16.6	-5.3
July [p)]	30.4	22.4	13.0	5.6	11.8	19.1	16.9	5.7	12.5	0.9
Growth rates										
2015	-0.4	0.5	-5.6	4.4	0.6	1.9	1.4	4.0	2.1	-0.2
2016	1.9	2.3	-1.6	5.8	2.2	2.3	2.0	4.0	2.7	-1.2
2017	1.9	3.1	0.1	4.7	1.8	3.2	2.9	7.2	3.3	-0.7
2017 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	4.7	1.8	3.2	2.9	7.2	3.3	-0.7
2018 Q1	2.2	3.3	2.6	4.4	1.4	3.0	2.9	7.2	3.0	-0.5
Q2	2.5	4.1	1.2	5.5	2.1	3.0	3.0	7.2	3.1	-1.2
2018 Feb.	2.0	3.2	0.4	5.1	1.7	2.9	2.9	7.5	2.9	-0.7
Mar.	2.2	3.3	2.6	4.4	1.4	3.0	2.9	7.2	3.0	-0.5
Apr.	2.4	3.3	3.3	4.1	1.5	3.0	2.9	7.5	2.9	-0.4
May	2.8	3.7	3.5	4.7	1.9	3.1	2.9	7.2	3.0	-0.5
June	2.5	4.1	1.2	5.5	2.1	3.0	3.0	7.2	3.1	-1.2
July [p)]	3.0	4.1	2.6	5.5	2.3	3.3	3.0	7.3	3.4	-0.7

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	284.7	205.9	135.6
2016	314.2	6,956.7	2,090.9	70.9	2,146.5	2,648.4	1,133.3	262.2	205.9	121.6
2017	356.5	6,768.8	1,968.8	59.7	2,016.1	2,724.2	934.2	311.0	143.8	93.4
2017 Q3	365.3	6,730.6	2,007.3	61.5	2,015.9	2,645.8	1,022.3	262.2	140.6	85.4
Q4	356.5	6,768.8	1,968.8	59.7	2,016.1	2,724.2	934.2	311.0	143.8	93.4
2018 Q1	339.7	6,748.3	1,952.1	59.4	2,020.0	2,716.7	911.2	321.3	136.2	87.0
Q2	318.2	6,698.6	1,949.9	58.5	2,020.1	2,670.1	862.1	417.3	174.3	184.9
2018 Feb.	347.1	6,741.1	1,958.3	59.8	2,016.0	2,707.0	840.5	371.4	124.3	81.8
Mar.	339.7	6,748.3	1,952.1	59.4	2,020.0	2,716.7	911.2	321.3	136.2	87.0
Apr.	349.7	6,768.0	1,956.2	59.3	2,019.9	2,732.6	880.5	356.8	147.1	153.6
May	329.3	6,750.2	1,950.8	58.9	2,029.8	2,710.7	858.3	390.1	177.5	187.9
June	318.2	6,698.6	1,949.9	58.5	2,020.1	2,670.1	862.1	417.3	174.3	184.9
July [p)]	352.8	6,691.1	1,954.6	57.8	2,011.5	2,667.2	848.7	372.6	184.2	193.9
Transactions										
2015	8.9	-216.5	-106.3	-13.5	-210.9	114.2	-87.5	-12.7	21.4	-4.0
2016	26.7	-122.7	-69.6	-9.1	-118.4	74.4	-274.9	-85.3	12.8	-12.0
2017	46.1	-83.1	-84.7	-8.7	-70.6	80.8	-91.8	-74.1	-60.9	-27.6
2017 Q3	65.0	-23.6	-25.4	-2.9	-30.5	35.2	30.9	10.7	-13.6	-24.3
Q4	-8.9	-35.4	-17.8	-1.8	-10.6	-5.1	-76.0	-59.2	3.2	7.9
2018 Q1	-16.7	11.7	-16.3	-1.3	12.4	17.0	62.2	-57.1	-7.6	-6.4
Q2	-21.5	-46.2	-5.4	-0.9	-25.8	-14.1	-67.3	56.9	16.4	19.7
2018 Feb.	30.6	-23.2	-3.7	-0.4	-16.3	-2.9	10.0	-10.3	-8.6	-2.4
Mar.	-7.4	19.3	-5.8	-0.4	8.7	16.7	79.8	-50.5	11.9	5.2
Apr.	10.1	6.9	3.3	-0.2	-9.2	13.0	-38.1	30.8	-10.8	-11.6
May	-20.4	-38.8	-7.7	-0.4	-6.8	-24.0	-51.7	-19.8	30.3	34.4
June	-11.1	-14.3	-1.0	-0.4	-9.8	-3.1	22.5	45.9	-3.2	-3.1
July [p)]	34.4	11.3	5.2	-0.7	-4.7	11.6	0.2	-50.4	9.8	9.0
Growth rates										
2015	3.5	-3.0	-4.8	-14.4	-8.6	4.6	-	-	11.6	-2.9
2016	9.4	-1.7	-3.3	-11.5	-5.3	2.8	-	-	6.3	-9.0
2017	14.5	-1.2	-4.1	-12.4	-3.4	3.1	-	-	-29.7	-22.7
2017 Q3	22.1	-1.0	-4.1	-12.5	-3.8	4.2	-	-	-31.3	-33.4
Q4	14.5	-1.2	-4.1	-12.4	-3.4	3.1	-	-	-29.7	-22.7
2018 Q1	11.8	-0.9	-4.1	-12.5	-1.5	2.5	-	-	-25.6	-22.2
Q2	5.7	-1.4	-3.2	-10.8	-2.7	1.3	-	-	-3.6	-17.3
2018 Feb.	17.0	-1.3	-3.7	-12.6	-2.7	2.0	-	-	-27.4	-21.6
Mar.	11.8	-0.9	-4.1	-12.5	-1.5	2.5	-	-	-25.6	-22.2
Apr.	7.3	-0.6	-3.6	-12.8	-1.6	2.8	-	-	-28.5	-27.3
May	5.9	-1.3	-3.6	-10.3	-2.4	1.6	-	-	-6.8	-11.5
June	5.7	-1.4	-3.2	-10.8	-2.7	1.3	-	-	-3.6	-17.3
July [p)]	10.2	-1.1	-2.5	-10.4	-2.9	1.5	-	-	22.5	24.6

Source: ECB.

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

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

3) Not adjusted for seasonal effects.

6 Fiscal developments

6.1 Deficit/surplus

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

	Deficit (-)/surplus (+)					Memo item: Primary deficit (-)/ surplus (+)
	Total	Central government	State government	Local government	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 Q2	-1.2	.	.	.	.	0.9
Q3	-1.0	.	.	.	.	1.0
Q4	-0.9	.	.	.	.	1.1
2018 Q1	-0.7	.	.	.	.	1.2

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 Q2	46.3	45.8	12.7	13.0	15.3	0.5	47.5	43.8	9.9	5.2	2.1	22.7	3.7
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	12.8	13.0	15.3	0.4	47.1	43.3	9.8	5.1	2.0	22.5	3.7
2018 Q1	46.2	45.8	12.9	13.0	15.2	0.4	46.9	43.2	9.8	5.1	1.9	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 Q2	89.1	2.7	14.9	71.4	.	.	.	.	.	.	.	.	.	.
Q3	88.1	2.8	14.7	70.7	.	.	.	.	.	.	.	.	.	.
Q4	86.7	2.6	14.4	69.8	.	.	.	.	.	.	.	.	.	.
2018 Q1	86.8	2.6	14.1	70.1	.	.	.	.	.	.	.	.	.	.

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 Q2	-1.7	-0.9	-0.6	-0.4	-0.2	-0.1	-0.1	0.0	-0.2	0.0	-0.3	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	-0.2	0.4	0.4	0.1	-0.2	0.1	-0.1	-0.5	-1.0	0.8
2018 Q1	-2.5	-1.2	-0.1	0.5	0.5	0.0	-0.1	0.2	-0.1	-0.5	-1.2	0.7

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		Issuance	Redemption
											Maturities of up to 1 year		
	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 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
2018 Q1	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
2018 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.	12.9	11.3	4.0	1.6	0.4	7.3	2.4	1.1	-0.2	2.8	2.5	0.4	1.1
May	12.9	11.3	3.7	1.6	0.4	7.3	2.4	1.1	-0.2	2.8	2.5	0.4	1.0
June	12.9	11.3	3.6	1.6	0.4	7.3	2.4	1.1	-0.2	2.8	2.5	0.4	0.9
July	12.8	11.3	3.7	1.6	0.4	7.3	2.3	1.1	-0.2	2.7	2.5	0.4	1.0

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 Q2	-1.6	1.0	-0.7	-0.5	1.1	-3.6	-3.1	-2.5	0.8
Q3	-1.3	1.3	-0.7	-0.6	1.1	-3.2	-2.9	-2.4	1.8
Q4	-1.0	1.2	-0.3	-0.4	0.8	-3.1	-2.6	-2.3	1.8
2018 Q1	-1.0	1.4	-0.6	-0.4	1.1	-3.0	-2.6	-2.2	2.4
	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 Q2	106.3	66.1	8.9	75.5	176.1	99.5	99.3	134.9	105.6
Q3	107.2	65.2	8.9	72.9	177.4	98.5	98.3	134.2	102.5
Q4	103.4	64.1	9.0	68.4	178.6	98.3	96.8	131.8	97.5
2018 Q1	106.3	62.9	8.7	69.3	180.4	98.8	97.7	133.4	94.7

	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 Q2	0.3	0.7	1.1	2.1	0.8	-1.2	-3.5	-1.0	-1.6	-1.0
Q3	0.1	0.9	1.4	3.3	1.0	-0.9	-2.4	-0.5	-1.6	-1.2
Q4	-0.5	0.5	1.5	3.9	1.2	-0.7	-3.0	0.0	-1.0	-0.6
2018 Q1	0.2	0.4	1.4	3.3	1.6	-0.5	-0.7	0.4	-1.0	-0.4
	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 Q2	39.9	41.7	23.4	55.0	58.9	81.4	131.7	79.8	51.7	61.8
Q3	38.2	39.4	23.4	53.4	57.2	80.2	130.5	78.5	51.3	60.6
Q4	40.1	39.7	23.0	50.7	57.1	78.3	125.7	73.6	50.9	61.3
2018 Q1	35.8	36.3	22.2	50.4	55.2	77.2	126.4	75.1	50.8	59.8

Source: Eurostat.

Postal address 60640 Frankfurt am Main, Germany
Telephone +49 69 1344 0
Website www.ecb.europa.eu

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