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Update on economic and monetary developments

Summary

The euro area is facing an economic contraction of a magnitude and speed that are unprecedented in peacetime. Measures to contain the spread of the coronavirus (COVID-19) have largely halted economic activity in all the countries of the euro area and across the globe. Survey indicators for consumer and business sentiment have plunged, suggesting a sharp contraction in economic growth and a profound deterioration in labour market conditions. Given the high uncertainty surrounding the ultimate extent of the economic fallout, growth scenarios produced by ECB staff suggest that euro area GDP could fall by between 5% and 12% this year, depending crucially on the duration of the containment measures and the success of policies to mitigate the economic consequences for businesses and workers. As the containment measures are gradually lifted, these scenarios foresee a recovery in economic activity, although its speed and scale remain highly uncertain. Inflation has declined as a result of the sharp fall in oil prices and slightly lower HICP inflation excluding energy and food.

In its determination to continue to support the euro area economy in the face of the current economic disruption and heightened uncertainty, the Governing Council decided to further ease the conditions on the targeted longer-term refinancing operations (TLTRO III) and to launch a new series of non-targeted pandemic emergency longer-term refinancing operations (PELTROs). In addition, purchases are conducted under the pandemic emergency purchase programme (PEPP), while net purchases are continuing under the asset purchase programme (APP) at a monthly pace of €20 billion together with the APP purchases under the additional €120 billion temporary envelope available until the end of the year. Together with the substantial monetary policy stimulus already in place, these measures will support liquidity and funding conditions and help to preserve the smooth provision of credit to the real economy. At the same time, the Governing Council will need to continually evaluate the measures, individually and as a package, to assess whether they are still adequately calibrated and of an appropriate size to provide the necessary degree of accommodation in the pursuit of its price stability mandate.

The coronavirus outbreak and the associated containment measures have paralysed the global economy and trade. The latest survey data point to a sharp contraction in global activity in the first half of 2020. China recorded its lowest growth level in decades in the first quarter of 2020, while the impact of the pandemic on other key economies is expected to be particularly visible in the second quarter. World trade is also estimated to have fallen sharply, driven by supply chain disruptions and a widespread demand shock. At the same time, the expected rapid deterioration in global activity and trade has been met with forceful policy measures globally. Global

inflationary pressures are expected to decrease further as a result of both the sharp fall in oil prices and weak demand.

Since the Governing Council meeting in early March 2020, long-term sovereign yields have increased amid some volatility and the price of risky assets has decreased. The spread of the coronavirus and the lockdown of numerous economies have placed enormous strain on euro area financial markets. However, a number of policy actions have helped to calm markets, leading to a reversal of the negative trend in most asset prices. The EONIA forward curve shifted slightly upwards, as markets were no longer expecting an imminent reduction in the deposit facility rate. In foreign exchange markets, the euro weakened slightly in trade-weighted terms.

The latest economic indicators and survey results covering the period since the coronavirus spread to the euro area have shown an unprecedented decline, pointing to a significant contraction in euro area economic activity and to rapidly deteriorating labour markets. The coronavirus pandemic and the associated containment measures have severely affected the manufacturing and services sectors, taking a toll on the productive capacity of the euro area economy and on domestic demand. In the first quarter of 2020, which was only partially affected by the spread of the coronavirus, euro area real GDP decreased by 3.8%, quarter on quarter, reflecting the impact of the lockdown measures in the final weeks of the quarter. The sharp downturn in economic activity in April suggests that the impact is likely to be even more severe in the second quarter. Given the highly uncertain duration of the pandemic, the likely extent and duration of the imminent recession and the subsequent recovery are difficult to predict.[1] Euro area growth is expected to resume as the containment measures are gradually lifted, supported by favourable financing conditions, the euro area fiscal stance and a resumption in global activity. However, the extent of the contraction and the recovery will depend crucially on the duration and the success of the containment measures, how far supply capacity and domestic demand are permanently affected, and the success of policies in mitigating the adverse impact on incomes and employment.

According to Eurostat's flash estimate, euro area annual HICP inflation decreased from 0.7% in March to 0.4% in April, largely driven by lower energy price inflation, but also slightly lower HICP inflation excluding energy and food. On the basis of the sharp decline in current and futures prices for oil, headline inflation is likely to decline considerably further over the coming months. The sharp downturn in economic activity is expected to lead to negative effects on underlying inflation over the coming months. However, the medium-term implications of the coronavirus pandemic for inflation are surrounded by high uncertainty, given that downward pressures linked to weaker demand may be partially offset by upward pressures related to supply disruptions. Market-based indicators of longer-term inflation expectations have remained at depressed levels. Even though survey-based indicators of inflation expectations have declined over the short and medium term, longer-term expectations have been less affected.

[1] For further information on growth scenarios produced by ECB staff, see the box entitled "Alternative scenarios for the impact of the COVID-19 pandemic on economic activity in the euro area" in this issue of the Economic Bulletin.

Regarding monetary developments, broad money (M3) growth increased to 7.5% in March 2020, from 5.5% in February. M3 growth continues to be backed by bank credit creation for the private sector, and the narrow monetary aggregate M1 remained the main contributor to broad money growth. Developments in loans to the private sector have also been shaped by the impact of the coronavirus. The annual growth rate of loans to households stood at 3.4% in March 2020, after 3.7% in February, while the annual growth rate of loans to non-financial corporations stood at 5.4% in March, after 3.0% in February. The results of the euro area bank lending survey for the first quarter of 2020 also indicate a surge in firms' demand for loans and for drawing on credit lines to meet liquidity needs for working capital, while financing needs for fixed investment have declined. Credit standards for loans to firms tightened slightly, while credit standards for loans to households tightened more strongly. At the same time, banks expect an easing of credit standards for loans to firms in the second quarter of 2020. The Governing Council's policy measures, in particular the more favourable terms for TLTRO III operations and the collateral easing measures, should encourage banks to extend loans to all private sector entities.

Combining the outcome of the economic analysis with the signals coming from the monetary analysis, the Governing Council confirmed that an ample degree of monetary accommodation is necessary for the robust convergence of inflation to levels that are below, but close to, 2% over the medium term.

On the basis of this assessment, the Governing Council decided to further ease the conditions on the ECB's TLTRO III operations .This will support further the provision of credit to households and firms in the face of the current economic disruption and heightened uncertainty, buffering the coronavirus shock on credit conditions. Specifically, the Governing Council decided to reduce the interest rate on TLTRO III operations during the period from June 2020 to June 2021 to 50 basis points below the average interest rate on the Eurosystem's main refinancing operations prevailing over the same period. Moreover, for counterparties whose eligible net lending reaches the lending performance threshold of 0%, the interest rate over the period from June 2020 to June 2021 will now be 50 basis points below the average deposit facility rate prevailing over the same period.[2]

The Governing Council also decided on a new series of non-targeted pandemic emergency longer-term refinancing operations (PELTROs) to support liquidity conditions in the euro area financial system and contribute to preserving the smooth functioning of money markets by providing an effective liquidity backstop. The PELTROs consist of seven additional refinancing operations commencing in May 2020 and maturing in a staggered sequence between July and September 2021 in line with the duration of the Governing Council's collateral easing measures. They will be carried out as fixed rate tender procedures with full allotment, with an interest rate that is 25 basis points below the average rate on the main refinancing operations prevailing over the life of each PELTRO.[3]

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2 For more detailed information on the new TLTRO conditions, see the ECB press release of 30 April 2020.

3 For more detailed information on PELTROs, see the ECB press release of 30 April 2020.

Since the end of March the Governing Council has been conducting purchases under the ECB's new pandemic emergency purchase programme (PEPP), which has an overall envelope of €750 billion, to ease the overall monetary policy stance and to counter the severe risks to the monetary policy transmission mechanism and the outlook for the euro area posed by the coronavirus pandemic. These purchases will continue to be conducted in a flexible manner over time, across asset classes and among jurisdictions. Net asset purchases will be conducted under the PEPP until the Governing Council judges that the coronavirus crisis phase is over, but in any case until the end of this year.

Moreover, net purchases under the ECB's APP will continue at a monthly pace of €20 billion, together with the purchases under the additional €120 billion temporary envelope until the end of the year. The Governing Council continues to expect monthly net asset purchases under the APP to run for as long as necessary to reinforce the accommodative impact of the policy rates in the euro area, and to end shortly before it starts raising the key ECB interest rates.

The Governing Council also intends to continue reinvesting, in full, the principal payments from maturing securities purchased under the APP for an extended period of time past the date when it starts raising the key ECB interest rates, and in any case for as long as necessary to maintain favourable liquidity conditions and an ample degree of monetary accommodation.

In addition, the Governing Council decided to keep the key ECB interest rates unchanged and expects them to remain at their present or lower levels until it has seen the inflation outlook robustly converge to a level sufficiently close to, but below, 2% within its projection horizon, and such convergence has been consistently reflected in underlying inflation dynamics.

Overall, the decisive and targeted policy measures that the Governing Council has taken since early March have provided crucial support to the euro area economy and especially to the sectors most exposed to the crisis. In particular, the measures are supporting liquidity conditions and helping to sustain the flow of credit to households and firms, especially small and medium-sized enterprises, and to maintain favourable financing conditions for all sectors and jurisdictions.

At the same time, in the current rapidly evolving economic environment, the Governing Council remains fully committed to doing everything necessary within its mandate to support all citizens of the euro area through this extremely challenging time. This applies first and foremost to the role of the Governing Council in ensuring that the ECB's monetary policy is transmitted to all parts of the economy and to all jurisdictions in the pursuit of its price stability mandate. The Governing Council is, therefore, fully prepared to increase the size of the PEPP and adjust its composition, by as much as necessary and for as long as needed. In any case, the Governing Council stands ready to adjust all of its instruments, as appropriate, to ensure that inflation moves towards its aim in a sustained manner, in line with its commitment to symmetry.

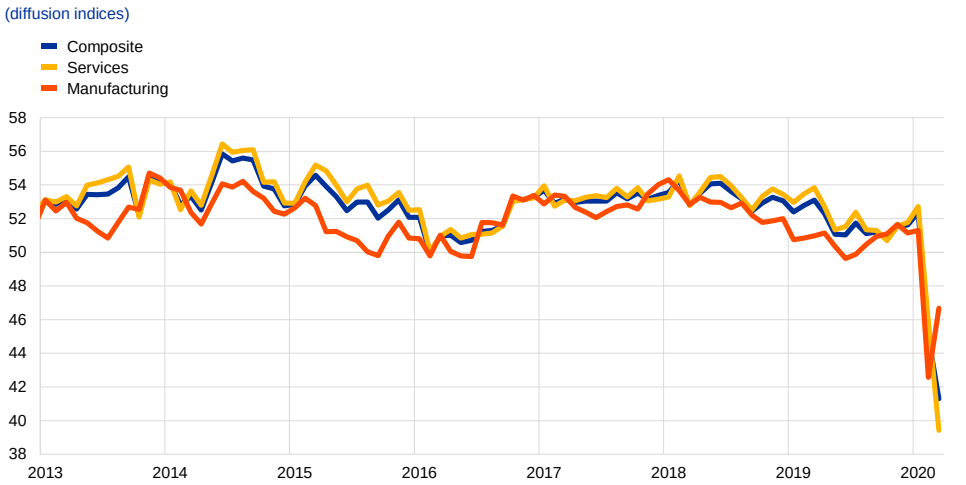
1 External environment

The coronavirus (COVID-19) outbreak has paralysed the global economy and trade. The measures taken by governments to contain the spread of the virus are a key factor driving the sharp decline in economic activity in the near term. Other factors also weighing on economic activity, especially in emerging market economies, include a sharp reduction in commodity prices, significant tightening of financial conditions and substantial capital outflows.

Survey data suggest that the economic fallout from containment measures is likely to be abrupt and deep. The global composite output Purchasing Managers' Index (PMI) excluding the euro area declined sharply from 52 in January to 45 in February and further to 41 in March. The decline was driven by the strong contraction in the services index, which plummeted to 39.4, the lowest level since December 2008 (see Chart 1). This points to a sharp contraction in global activity (excluding the euro area) in the first half of 2020, which is likely to be more pronounced than at the trough observed during the global financial crisis (GFC).

Chart 1

Global composite output PMI (excluding the euro area)



Sources: Markit and ECB calculations.
Note: The latest observations are for March 2020.

The expected rapid deterioration in activity has been met with forceful policy measures. Central banks that had room to decrease interest rates used it promptly and cut their key policy rates, while some have also resumed asset purchases. Liquidity-providing operations and swaps have been implemented to smooth the functioning of financial markets. In addition, large fiscal stimulus packages have been enacted, with the composition of such packages being heavily skewed towards loan guarantees and income support measures.

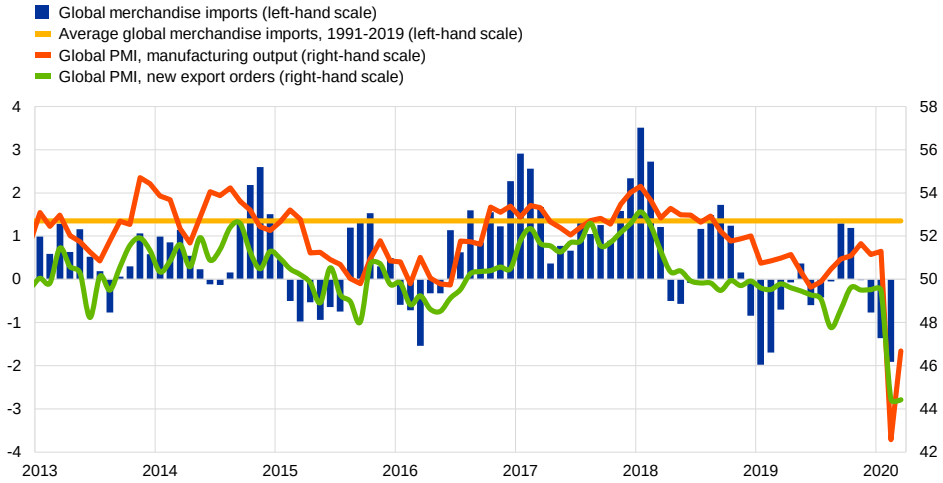
World trade is estimated to have fallen sharply, driven by supply chain disruptions and a widespread demand shock. In the first quarter of 2020 virus-related production disruptions in China affected international trade, especially in Asian countries strongly interconnected with China through regional value chains.

However, as the outbreak turned into a pandemic, production disruptions spread and are likely to weigh on global trade for some time. Global merchandise imports contracted marginally further in February, extending the decline seen at the end of 2019. At the same time, the global PMI for new export orders excluding the euro area remained unchanged in March at a very low level, pointing overall to a sharp fall in global trade in the first quarter of 2020 (see Chart 2).

Chart 2

Surveys and global trade in goods (excluding the euro area)

(left-hand scale: three-month-on-three-month percentage changes; right-hand scale: diffusion indices)



Sources: Markit, CPB Netherlands Bureau for Economic Policy Analysis and ECB calculations.
Note: The latest observations are for February 2020 for global merchandise imports and March 2020 for the PMIs.

Global inflation slowed slightly in February. Annual consumer price inflation in the countries of the Organisation for Economic Co-operation and Development (OECD) declined to 2.2% in February, driven by a moderation in energy price inflation, while food price inflation increased slightly. Meanwhile, inflation excluding food and energy remained stable at 2.2% in February. The slowdown in inflation was broad-based across most advanced economies and major non-OECD emerging market economies. Looking ahead, global inflationary pressures are expected to decelerate further as a result of both the sharp fall in oil prices and weak demand.

Brent crude oil prices have declined by approximately 43% since the March meeting of the Governing Council, primarily owing to a sudden collapse in demand associated with the COVID-19 pandemic. On 12 April 2020 the OPEC+ group announced plans to restrict oil supplies, but these are unlikely to fully offset the loss of demand in the near term. While supply shocks contributed to market volatility, reduced demand and rising risk aversion were the key factors driving the fall in Brent crude oil prices to around USD 20 per barrel. Lack of adequate storage capacity has put further downward pressure on oil prices. Notably, North American producers were temporarily forced to dispose of oil at negative prices to avoid shutting down oil wells, as doing so would have permanently damaged their production capacity. The International Energy Agency expects full-year global oil demand to decline for the first time in over a decade, forecasting a fall of -9.3% in 2020. Total non-oil commodity

prices have declined markedly (-8.5%) since the March Governing Council meeting as both metal prices (-9.2%) and food prices (-5.7%) decreased.

Containment measures will lead to a decline in US economic activity in the first half of 2020, particularly in the second quarter. Advance estimates for the first quarter suggest that GDP contracted at an annualised rate of 4.8%. This constitutes the largest decline in GDP since the global financial crisis, when GDP fell by 8.4% in the final quarter of 2008. As this advance estimate is based on incomplete data and subject to further revisions, forthcoming releases could show an even larger decline in GDP. The impact on economic activity is expected to be even larger in the second quarter. By end-March, almost all US states had ordered wide-ranging business closures and strict limits on movement. The cumulative number of workers seeking unemployment insurance from mid-March to end-April reached around 30 million, i.e. 19% of the labour force. As a result, consumer confidence and spending has plunged. In early April the University of Michigan Consumer Sentiment Index fell to its lowest level since December 2011, while retail sales fell steeply by a record 8.7% in March. Sharp drops in other indicators, such as PMIs, point to a more generalised impact on activity. Overall, US GDP is expected to shrink in the first half of the year by more than during the GFC. The policy response has been immediate. On the fiscal side, US Congress agreed on fiscal support amounting to almost 10% of GDP, consisting of government spending to contain the outbreak and measures to attenuate its effects. On the monetary side, the Federal Reserve System cut the target range for the federal funds rate to between 0% and ¼%. It also established a number of credit facilities that can provide up to USD 2.3 trillion in financing against a wide range of collateral, activated swap lines with other central banks, expanded its repo operations and relaxed prudential policies to ensure that financial markets remain liquid and credit continues to flow through the economy.

In Japan, the pandemic has had a severe impact on activity, despite the strong policy response. The pandemic struck when the economy was starting to show signs of a modest rebound following the sharp contraction in the final quarter of 2019 related to the October VAT hike and typhoons. The Composite PMI fell to its lowest level since the March 2011 Great East Japan earthquake and tsunami, and the Reuters Tankan signalled a further deterioration in business conditions in April. Prior to declaring a state of emergency, the government announced a sizeable economic package in response to the coronavirus crisis. Although the overall size of the announced package appears unprecedented (JPY 108 trillion, about 20% of GDP), a large part is related to private sector outlays. In addition, it includes the December 2019 fiscal stimulus and the two 2020 emergency fiscal packages. This follows steps taken by the Bank of Japan, including the provision of ample supply of liquidity via JGB purchases and US dollar-providing operations, an increase in purchases of commercial paper and bonds and the introduction of a special funds-supplying operation to facilitate corporate financing.

Incoming data for the United Kingdom suggest that the coronavirus outbreak has had a significant adverse impact on an already slowing economy. The monthly GDP release for February, on a three-month-on-three-month basis, showed that the UK economy was stagnating even ahead of the pending coronavirus

outbreak. Since then, the March PMI Composite Output Index has plummeted to a new series low, far below even the worst readings seen at the depths of the GFC. Economic policy responses have been swift and strong. On 11 March the Bank of England cut interest rates to 0.25% (subsequently reduced further to 0.1%), introduced a new Term Funding Scheme and reduced the countercyclical capital buffer. This support has been further extended to include a round of quantitative easing and the reactivation of a temporary monetary financing facility for the government. At the same time, the government introduced a series of coronavirus contingency measures, including a variety of income support measures, additional budget for the National Health Service, as well as an expansive array of loan facilities, tax payment holidays and grants to small businesses.

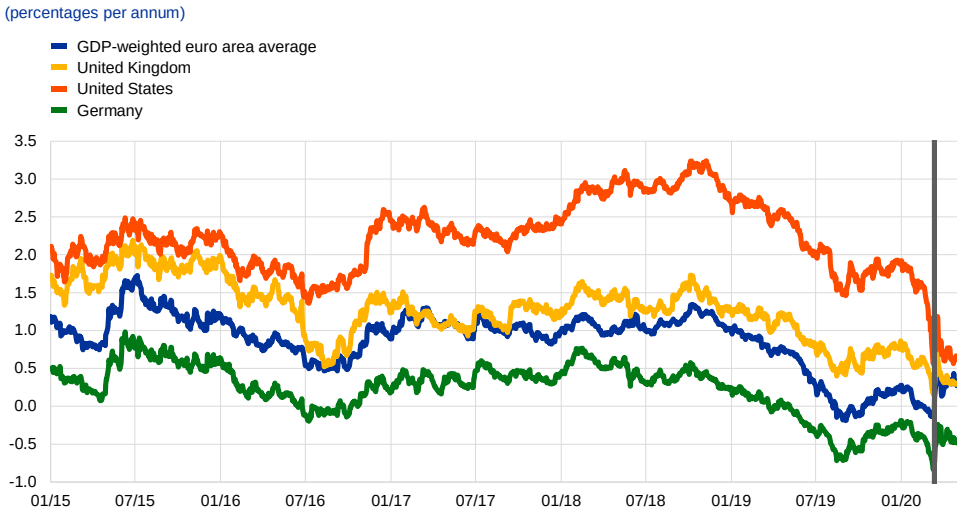
Economic growth in China has fallen to its lowest level in decades as a result of the pandemic and weak external demand. In the first quarter of 2020 GDP decreased by 6.8% year on year owing to virus containment measures. However, high-frequency indicators of economic activity suggest that activity is recovering. While daily coal consumption in early-April continued at levels that were around 15 percentage points lower than during the same period last year, real estate activity and traffic congestion indices are only marginally below the levels observed during the same period in 2019. Activity is expected to rebound only partly in the second quarter of 2020 as weak domestic demand is amplified by weak external demand, held back by cautious consumer behaviour and the prevailing containment measures. Policy measures have been implemented to support the economy and ensure liquidity in the banking system. The People's Bank of China has repeatedly injected significant liquidity in the market since the beginning of the year and has cut policy and reserve requirement rates. Fiscal policy stimulus in the form of tax exemptions, purchase vouchers, income support and loan guarantees is expected to cushion the impact of the pandemic.

2 Financial developments

Long-term sovereign yields in the euro area increased over the review period amid some volatility in the wake of the spread of COVID-19 and the lockdown of numerous economies. Over the review period (12 March 2020 to 29 April 2020), the GDP-weighted euro area ten-year sovereign bond yield increased overall by 14 basis points to 0.25% (see Chart 3), more or less mirroring the increase in the ten-year overnight index swap (OIS) rate. There was some volatility, however, with markets reacting to news of the virus' spread and related lockdowns by sharply increasing the yields of most euro area issuers. Following the announcement of accommodative economic policy measures (both monetary and fiscal), the increase in sovereign yields was partially reversed. Elsewhere, ten-year sovereign bond yields in the United States decreased by around 20 basis points over the review period to 0.63%, whereas UK yields increased slightly to 0.29%.

Chart 3

Ten-year sovereign bond yields



Sources: Refinitiv and ECB calculations.
Notes: Daily data. The vertical grey line denotes the start of the review period on 12 March 2020. The latest observations are for 29 April 2020.

Euro area sovereign bond spreads relative to the risk-free OIS rate initially decreased following the announcement of the new pandemic emergency purchase programme (PEPP) before increasing again for most countries. The spread on Portuguese, Spanish, German and Greek ten-year sovereign bonds increased overall by 7, 10, 13 and 29 basis points respectively over the review period. In contrast, the Italian and French spreads fell by 25 and 11 basis points respectively, following an increase prior to the review period. Overall, the GDP-weighted euro area spread increased by 14 basis points to 25 basis points.

Equity price indices for euro area non-financial corporations (NFCs) increased sharply, thus reversing part of the marked decline that started at the end of February. In a partial reversal of this severe decline, euro area NFC equity prices increased by 17.9% over the review period. This rebound was supported by a reduction in the equity risk premium which more than offset a large reduction in

earnings expectations in a highly-uncertain environment. The rebound in equity prices for euro area financial corporations was smaller in size (a 10.9% increase over the review period). The underperformance of the financial indices highlights the challenges facing this sector.

Euro area corporate bond spreads increased over the review period, reflecting an increase in expected default rates. The spreads on both investment-grade NFC bonds and financial sector bonds relative to the risk-free rate increased to stand at 119 and 152 basis points respectively. Spreads reached an intra-period high on March 24 at around 75 and 45 basis points respectively above the levels prevailing at the end of the review period, but have been slowly declining since.

The euro overnight index average (EONIA) and the new benchmark euro short-term rate (€STR) averaged -45 and -53 basis points respectively over the review period.[4] Excess liquidity increased by approximately €246 billion to around €2,011 billion, mainly reflecting the introduction of the new PEPP and the asset purchase programme (APP), as well as the take-up of targeted longer-term refinancing operations (TLTRO III) and LTRO bridge operations.

The EONIA forward curve shifted slightly upwards over the review period, as markets did not expect an imminent reduction in the deposit facility rate. By the end of 2024, the curve reaches 10 basis points above the current level of the EONIA. Overall, it remains below zero for horizons up to 2027, reflecting continued market expectations of a prolonged period of negative interest rates.

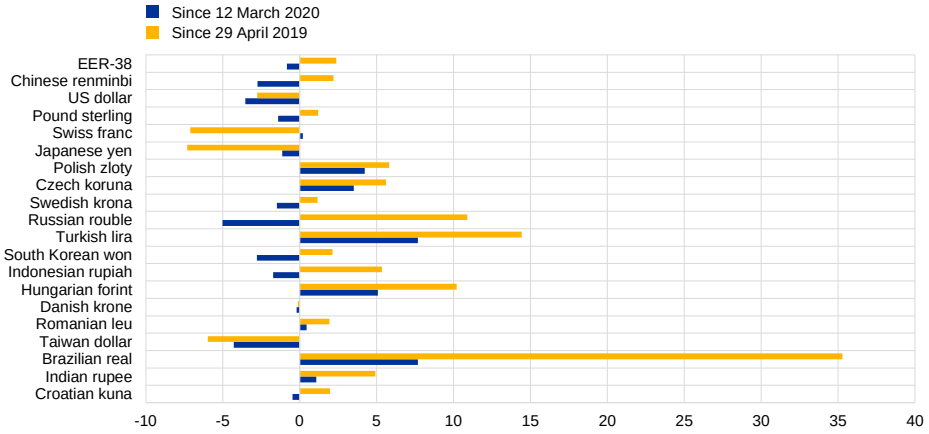
In foreign exchange markets, the euro weakened slightly in trade-weighted terms over the review period (see Chart 4), reflecting an appreciation against the currencies of several emerging market economies which was largely offset by a depreciation against the US dollar. The euro's nominal effective exchange rate, as measured against the currencies of 38 of the euro area's most important trading partners, depreciated by 0.8%. Regarding bilateral exchange rate developments, the euro depreciated (by 3.5%) against the US dollar and pound sterling (by 1.4%) following a phase of increased volatility. The euro also depreciated against the Chinese renminbi (by 2.7%), reversing an earlier appreciation and reflecting the different timing of the main economic impacts of the COVID-19 pandemic. By contrast, the euro strengthened vis-à-vis the majority of currencies of non-euro area EU Member States and emerging economies, most notably the Turkish lira and the Brazilian real (both by 7.7%).

[4] The methodology for computing the EONIA changed on 2 October 2019; it is now calculated as the €STR plus a fixed spread of 8.5 basis points. See the box entitled "Goodbye EONIA, welcome €STR!", *Economic Bulletin*, Issue 7, ECB, 2019.

Chart 4

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. A positive (negative) change corresponds to an appreciation (depreciation) of the euro. All changes have been calculated using the foreign exchange rates prevailing on 29 April 2020.

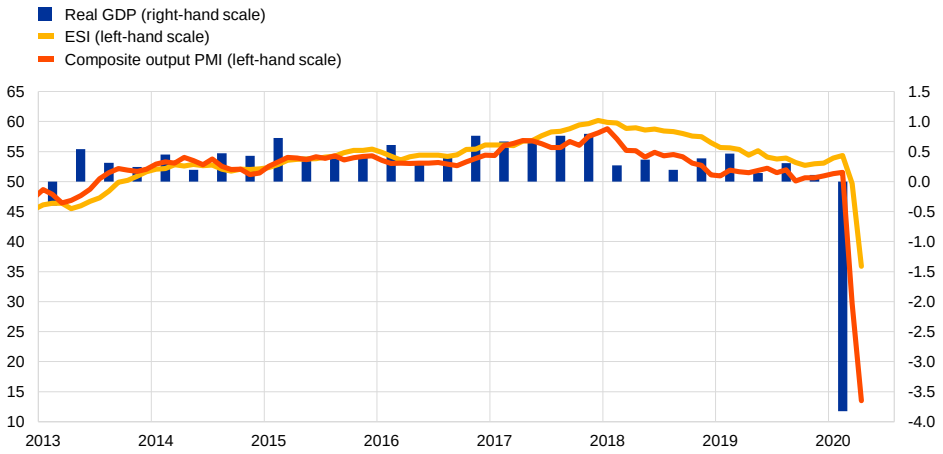
3 Economic activity

Euro area real GDP contracted sharply in the first quarter of 2020, reflecting in particular the impact of the coronavirus (COVID-19) outbreak and the associated containment measures. Total economic activity declined by 3.8%[5], quarter on quarter, in the first quarter of 2020, following growth of 0.1% in the fourth quarter of 2019 (see Chart 5). Although a breakdown is not yet available, short-term indicators suggest that the drop in GDP in the first quarter of 2020 was driven by domestic demand, while changes in inventories and net trade may have provided small positive contributions to growth. Economic indicators, particularly surveys, have recently shown unprecedented falls, pointing to a sharp decline in output in the period ahead. It is likely that the peak impact of the COVID-19 pandemic will materialise in the second quarter of 2020.

Chart 5

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

(left-hand scale: diffusion index; right-hand scale: quarter-on-quarter percentage changes)



Sources: Eurostat, European Commission, Markit and ECB calculations.
Notes: The Economic Sentiment Indicator (ESI) is standardised and rescaled to have the same mean and standard deviation as the Purchasing Managers' Index (PMI). The latest observations are for the first quarter of 2020 for real GDP and April 2020 for the ESI and the PMI.

Short-term labour market indicators for March and April 2020 point to a sharp deterioration in the labour market related to COVID-19 developments. The Purchasing Managers' Index (PMI) for employment recorded unprecedented falls from 51.4 in February to 42.2 in March and 33.4 in April, its lowest level on record, suggesting a strong contraction in employment. The decline was particularly sharp in the services sector.

However, the latest labour market data for the euro area only partly reflect the impact of the COVID-19 outbreak and associated containment measures.

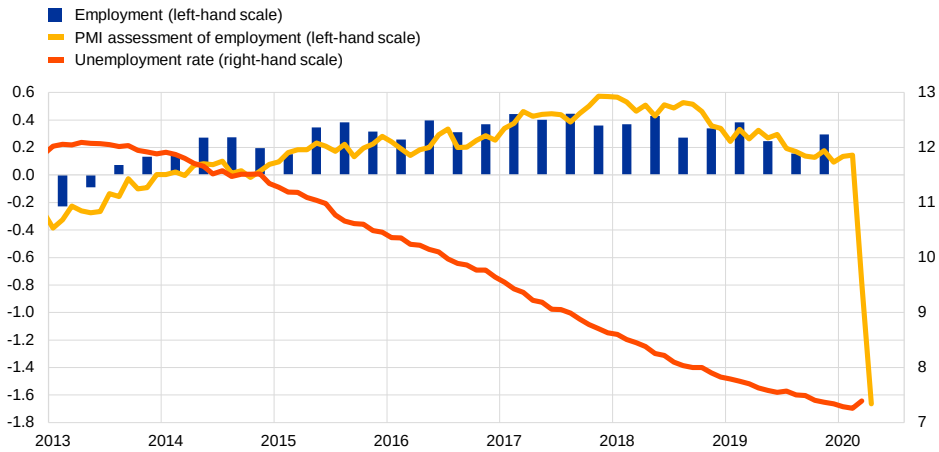
[5] Eurostat released its preliminary GDP flash estimate on 30 April 2020. This estimate is expected to be revised in the forthcoming GDP releases on 15 May and 9 June 2020, when more complete primary source data are expected to be available. The revisions to the preliminary GDP flash estimate might be greater than usual (+/-0.1 percentage points) as some countries had to adapt their national estimation methods, by using alternative sources or different models, to address the disrupted availability of source data and ensure the best possible quality.

Employment data for the first quarter of 2020 are not yet available. The unemployment rate declined to 7.3% in February, a similar rate to that observed before the financial crisis. However, it increased to 7.4% in March, the first month affected by the spread of COVID-19 and the subsequent implementation of containment measures across the euro area (see Chart 6). The muted reaction of unemployment may be related to measures to ease access to short-time work schemes. Preliminary estimates show an unprecedented number of employees in these schemes across the five largest euro area countries.

Chart 6

Euro area employment, PMI assessment of employment and the unemployment rate

(left-hand scale: quarter-on-quarter percentage changes, diffusion index; right-hand scale: percentages of labour force)



Sources: Eurostat, Markit and ECB calculations.
Notes: The PMI is expressed as a deviation from 50 divided by 10. The latest observations are for the fourth quarter of 2019 for employment, April 2020 for the PMI and March 2020 for the unemployment rate.

The deterioration in consumption indicators is unprecedented. Consumer confidence fell strongly following the COVID-19 outbreak, dropping to -22.7 in April (from -6.6 in February), close to the historical lows recorded in March 2009. However, there are indications that the fall in consumer confidence may in fact underestimate the underlying decline in consumption. The speed and severity of the COVID-19 shock have been so exceptional that the historical relationship between consumer confidence and consumption growth currently seems quite unstable.[6] In March 2020 euro area passenger car registrations recorded a steep drop (-56.4%) as a result of the COVID-19 outbreak. With lockdown measures in place in most markets from around the middle of March, the vast majority of euro area car dealerships were closed during the second half of that month. Similarly, other high-frequency indicators suggest an unprecedented drop, by up to 45%, in household expenditure (e.g. restaurants, transport services, recreation, tourism and retail sales).

The medium-term impact of COVID-19 on private consumption is very uncertain. There is a direct effect of the COVID-19 shock through the rationing of

6 The European Commission's consumer confidence indicator has been constructed as a coincident indicator of private consumption growth. In April 2020 no data could be collected in Italy, therefore the April 2020 values for the euro area aggregate were computed assuming that the changes compared with March were the same as in the euro area aggregate excluding Italy. For more details on this consumer confidence indicator, see *A revised consumer confidence indicator*, European Commission, 2018.

several expenditure components. The indirect effects are expected to materialise via the impact on income, wealth and access to credit. Furthermore, pent-up demand may have a positive impact once containment measures are lifted. The medium-term impact on private consumption depends on the duration of the lockdowns, the pace at which measures are relaxed, changes in household behaviour and the effectiveness of public policies.

Business investment is expected to fall substantially as a result of the lockdowns and further containment measures across euro area countries since March 2020. Following non-construction investment growth of 8.0%, quarter on quarter, in the fourth quarter of 2019 (0.2% excluding Irish data), investment dynamics decelerated in the first quarter of 2020 and the outlook for the second quarter is poor. The dramatic fall in manufacturing production and sales, driven by a combination of supply and demand factors related to the COVID-19 pandemic, is expected to have had a major adverse impact on business investment from March 2020 onwards. European Commission survey data up to April show strong declines in order books and production expectations in the capital goods sector. High-frequency data also point to a substantial deterioration in firms' profit expectations and financing conditions as well as a sharp increase in uncertainty, which would adversely affect future investment decisions. While the euro area sectoral accounts showed continued growth in gross operating surplus in the fourth quarter of 2019, market data of one-year-ahead expected earnings per share among European listed firms dropped significantly in April 2020. Investment-grade corporate bond yields also rose steeply, particularly in the oil and automotive sectors. Uncertainty in terms of stock market volatility indices has spiked in Europe, with the European composite indicator of systemic stress reaching unprecedented levels in April 2020. There are also substantial downside risks to firms' investment plans from rising debt levels, potential insolvencies and corporate defaults on long-term debt commitments, as well as declining cash flows. The extent to which national, euro area and EU-wide policy measures to provide liquidity and credit can alleviate the situation remains to be seen. Euro area forecasts for investment have been revised down significantly, with the European Commission's biannual industrial investment survey published in April 2020 showing an expected contraction of 4% in 2020.

Housing investment is expected to have fallen dramatically since March 2020 as a result of the containment measures and increased uncertainty. Although housing investment increased slightly in the fourth quarter of 2019 (by 0.3%, quarter on quarter), some short-term indicators reflecting the impact of the pandemic have already started to signal a substantial decline in construction activity. In particular, the euro area PMI for business expectations in construction plunged to 33.5 in March 2020, its lowest level on record, from 52.5 in February, pointing to an unprecedented decline in activity. The suspension of plans and the shutdown of construction sites – especially in countries where lockdown measures were implemented at an early stage, such as Germany, Italy and Spain – have already caused severe financial problems for construction companies, according to the European Commission's survey on limits to production. Over the medium term, while construction activity may benefit from lockdown measures being lifted earlier than in other sectors, it is likely that the pandemic will result in a significant decline in housing demand owing to

income and wealth losses. Moreover, the uncertainty caused by the pandemic might have even larger and longer-lasting effects on activity, as it could encourage households and investors to postpone property transactions until an effective medical solution for COVID-19 is found.

Euro area trade is likely to have contracted in the first quarter of 2020 and to weaken further in the second quarter, as COVID-19 has paralysed economies globally. The early signs of a recovery in euro area trade at the beginning of 2020 were reversed by the effects of the pandemic. In particular, extra-euro area imports have been contracting since February, signalling that supply interruptions due to the lockdown in China had reduced the country's exports to the euro area. There was an unprecedented deterioration in new export orders, a leading indicator, to 18.9 in April, from 49.5 in January. Containment measures in several euro area countries resulted in a combination of adverse demand and supply shocks, leading to the largest drop on record in euro area foreign trade. There are a number of reasons why euro area trade is severely affected by the negative shocks of the pandemic. First, investments and durable goods consumption, which are highly sensitive to both uncertainty and cyclical swings, are core components of foreign trade. Second, disruptions to global supply chains, in particular the reduction in imports of intermediate goods, also affect the euro area during this pandemic. Finally, the spillover and spillback via regional production networks magnify domestic shocks in euro area economies, resulting in an even sharper contraction in intra-euro area flows than in total trade flows. Countries specialised in services or in manufacturing related to services are expected to face particularly severe economic consequences. Tourism and transport services are the worst affected by lockdown measures, as seen in the collapse in new services export orders and in flight schedules.

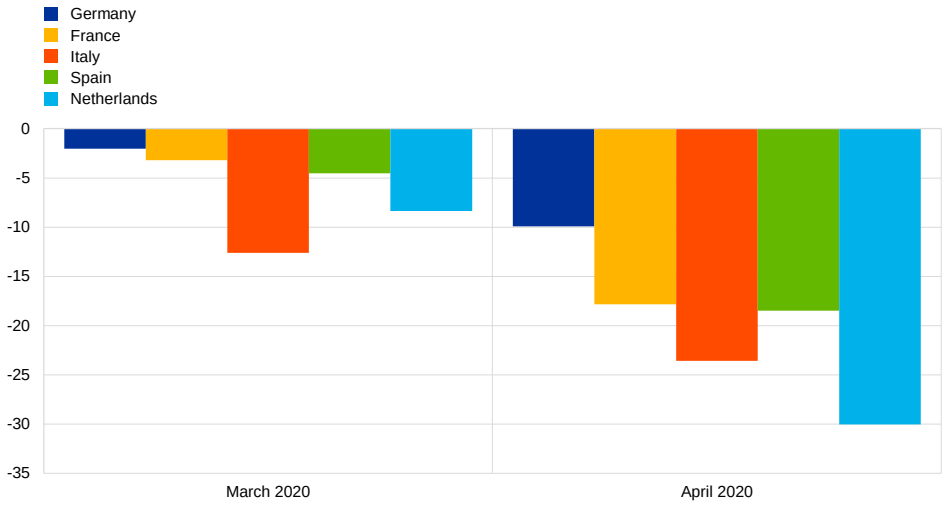
Incoming economic data, particularly survey results, show unprecedented falls, pointing to contracting output in the euro area. The COVID-19 outbreak and the associated containment measures have had an adverse impact on activity in manufacturing and services via increasing supply constraints and rapidly falling demand. As regards recent survey data, the European Commission's Economic Sentiment Indicator and the composite output PMI both posted the largest decline on record in March[7], before falling further in April. Both the ESI and the PMI displayed broad-based declines across both countries and economic sectors. This decline in economic activity is also confirmed by high-frequency indicators such as electricity consumption (see Chart 7).

7 For more details on the foreign versus domestic factors driving the fall in economic activity, see the box entitled "The fall in manufacturing and services activity in the euro area: foreign versus domestic shocks" in this issue of the Economic Bulletin.

Chart 7

Euro area electricity consumption

(annual percentage changes)



Sources: European Network of Transmission System Operators for Electricity (ENTSO-E) and ECB calculations.
Notes: Data are not corrected for temperatures. The latest observation is for 27 April 2020.

Looking beyond the immediate disruption stemming from the coronavirus pandemic, euro area growth is expected to resume as the containment measures are gradually lifted, supported by favourable financing conditions, the euro area fiscal stance and a resumption in global activity. However, uncertainty is extremely elevated and will remain high, making it very difficult to predict the likely extent and duration of the imminent recession and subsequent recovery.[8] The results of the latest round of the ECB Survey of Professional Forecasters, conducted in early April, showed that the private sector GDP growth forecasts have been revised substantially downwards for 2020 and have been revised upwards for 2021, compared with the previous round conducted in early January.

[8] For detailed analysis on alternative scenarios, see the box entitled "Alternative scenarios for the impact of the COVID-19 pandemic on economic activity in the euro area" in this issue of the Economic Bulletin.

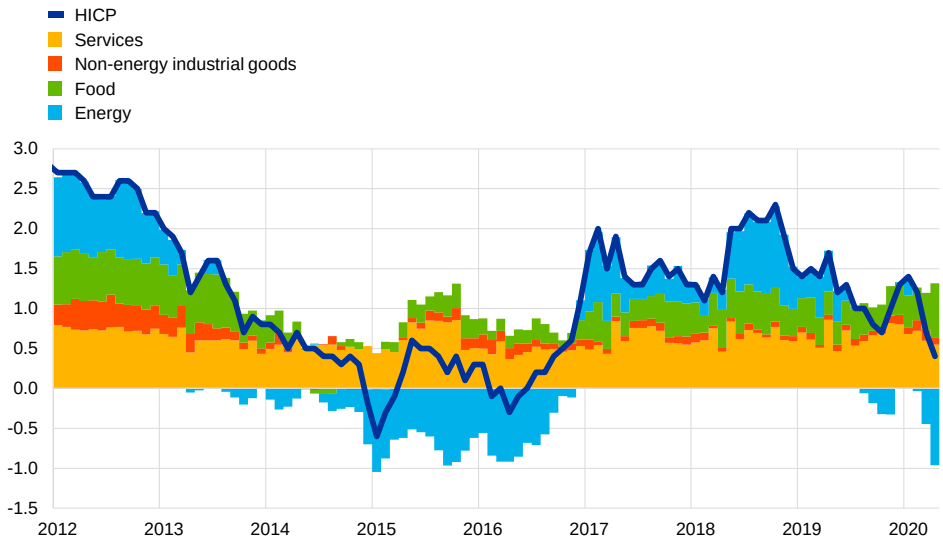
4 Prices and costs

According to Eurostat's flash estimate, HICP inflation decreased further to 0.4% in April, after 0.7% in March 2020 and 1.2% in February 2020. The decrease in April mainly reflected a drop in annual energy inflation rates from -4.5% in March to -9.6% in April on account of the recent oil price slump, but services and non-energy industrial goods inflation also declined compared to the previous month. These declines more than offset an increase in food inflation, which in turn was mostly due to a doubling of unprocessed food inflation. According to Eurostat, prices for at least 50% or more of the underlying basket for the euro area HICP flash estimate and the special aggregates were collected as usual.[9] However, there have been price collection difficulties for some countries and some products, leading to a higher share of imputations than usual (see also the box entitled "Inflation measurement in times of economic distress" in this issue of the Economic Bulletin).

Chart 8

Contributions of components of euro area headline HICP inflation

(annual percentage changes; percentage point contributions)



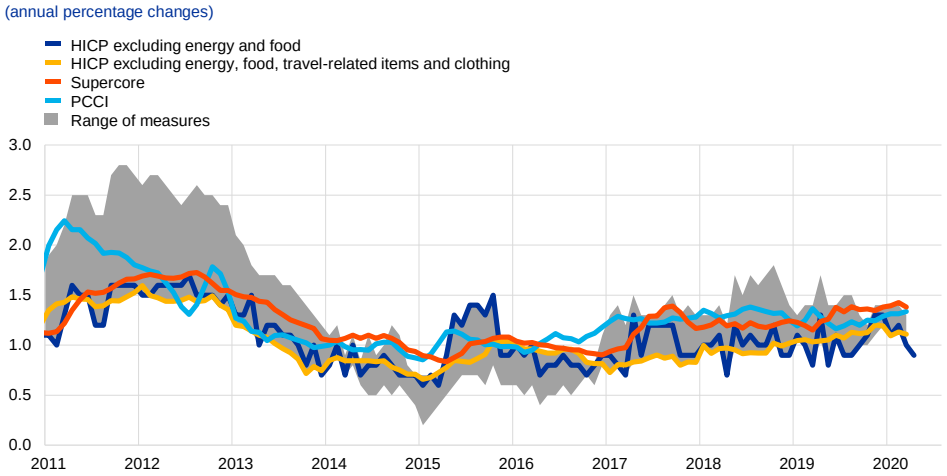
Sources: Eurostat and ECB calculations.
Notes: The latest observations are for April 2020 (flash estimates). Growth rates for 2015 are distorted upwards owing to a methodological change (see the box entitled "A new method for the package holiday price index in Germany and its impact on HICP inflation rates", *Economic Bulletin*, Issue 2, ECB, 2019).

Measures of underlying inflation declined or remained unchanged. HICP inflation excluding energy and food declined to 0.9% in April, from 1.0% in March and 1.2% in February. Other measures of underlying inflation, for which data are available up to March, were broadly unchanged. HICP inflation excluding energy, food, travel-related items and clothing remained at 1.1% in March, unchanged from February and January. Signals from other measures of underlying inflation, including

[9] See the Eurostat press release on the HICP flash estimate for April.

the Persistent and Common Component of Inflation (PCCI) indicator and the Supercore indicator,[10] also remained broadly unchanged.

Chart 9
Measures of underlying inflation



Sources: Eurostat and ECB calculations.
Notes: The latest observations are for April 2020 for HICP excluding energy and food (flash estimate) and for March 2020 for all other measures. The range of measures of underlying inflation 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 of the HICP; the 30% trimmed mean of the HICP; and the weighted median of the HICP. Growth rates for HICP excluding energy and food for 2015 are distorted upwards owing to a methodological change (see the box entitled "A new method for the package holiday price index in Germany and its impact on HICP inflation rates", *Economic Bulletin*, Issue 2, ECB, 2019).

Pipeline price pressures for HICP non-energy industrial goods remained stable at the later stages of the supply chain in February. The annual rate of change in producer prices for domestic sales of non-food consumer goods was 0.7% in February 2020, unchanged since October 2019. The annual rate of change in import prices for non-food consumer goods rose to 0.4% in February, up from 0.2% in January. At the earlier stages of the supply chain, domestic producer price inflation for intermediate goods weakened, declining to -1.2% in February, from -1.1% in January. Import price inflation for intermediate goods increased slightly to -0.1% in February, from -0.3% in January and -1.2% in December.

Wage growth decreased. Annual growth in compensation per employee stood at 1.7% in the fourth quarter of 2019, down from 2.1% in the third quarter. The figures for 2019 were affected by a significant drop in employers' social security contributions in France.[11] Annual growth in wages and salaries per employee, which excludes social security contributions, was 2.1% in the fourth quarter, down from 2.5% in the third quarter, and averaged 2.4% in 2019, compared with 2.3% in 2018. Looking across the different indicators and through temporary factors, wage growth decreased slightly in the course of 2019, although it remained at rates around or slightly above historical averages.

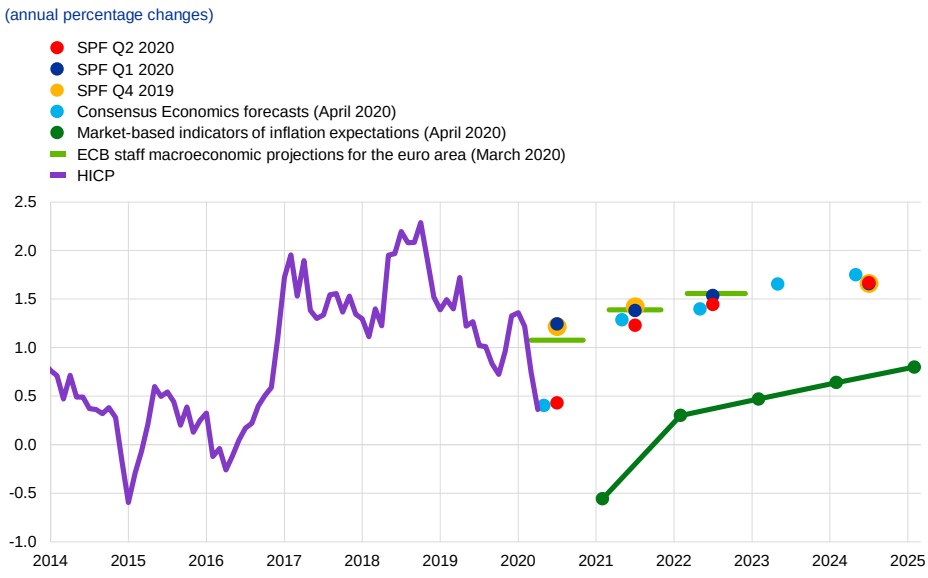
[10] For further information on these measures of underlying inflation, see Boxes 2 and 3 in the article entitled "Measures of underlying inflation for the euro area", *Economic Bulletin*, Issue 4, ECB, 2018.

[11] For a discussion, see the box entitled "Recent developments in social security contributions and minimum wages in the euro area", *Economic Bulletin,* Issue 8, ECB, 2019.

Market-based indicators of longer-term inflation expectations stood largely unchanged at the end of the review period, despite large movements, while survey-based indicators of inflation expectations remained at the relatively low levels seen over the course of 2019. Despite reaching a new all-time low of 0.72% at the end of March, market-based indicators of longer-term inflation expectations recovered in April to stand largely at the level prevailing at the beginning of the review period. The five-year forward inflation-linked swap rate five years ahead stood at 0.90% on 29 April 2020. The market-based probability of deflation increased strongly, reaching a new all-time high. The increase comes in part from large decreases in the price of oil. At the same time, the forward profile of market-based indicators of inflation expectations continues to point to the risk of a prolonged period of very low inflation. The results of the ECB Survey of Professional Forecasters (SPF) for the second quarter of 2020 show average longer-term inflation expectations unchanged at 1.7%, while short-term inflation expectations have been revised downwards sharply, mainly owing to a combination of a changed profile for oil price assumptions and the weaker economic outlook. Average point forecasts for annual HICP inflation now stand at 0.4% for 2020, 1.2% for 2021 and 1.4% for 2022. This represents decreases of 0.8, 0.2 and 0.1 percentage points for 2020, 2021 and 2022, respectively.

Chart 10

Market and survey-based indicators of inflation expectations



Sources: ECB Survey of Professional Forecasters (SPF), ECB staff macroeconomic projections for the euro area (March 2020) and Consensus Economics (14 April 2020).
Notes: The SPF for the second quarter of 2020 was conducted between 31 March and 7 April 2020. The market-implied curve is based on the one-year spot inflation rate and the one-year forward rate one year ahead, the one-year forward rate two years ahead, the one-year forward rate three years ahead and the one-year forward rate four years ahead. The latest observations for market-based indicators of inflation expectations are for 29 April 2020.

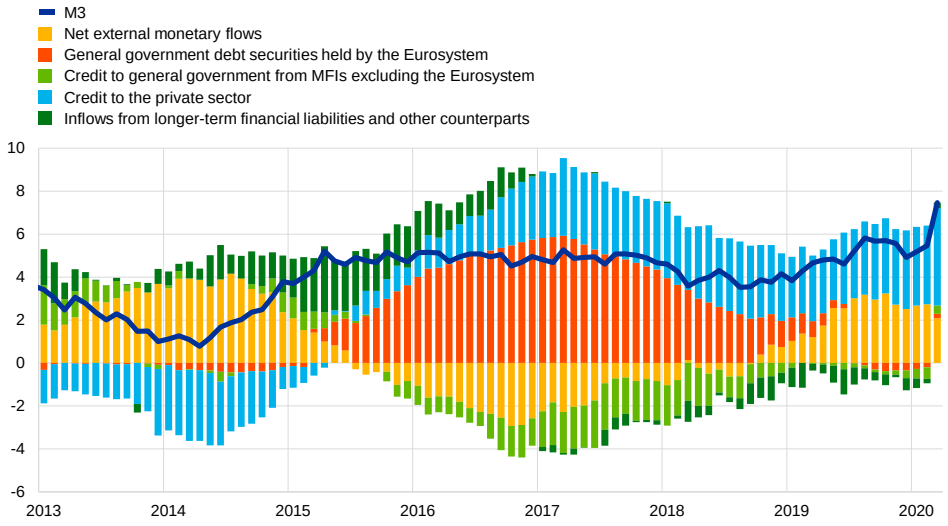
5 Money and credit

Broad money growth accelerated in March. With an increase of 7.5% in March 2020, after 5.5% in February, the annual growth rate of M3 recorded its largest month-on-month increase since the start of monetary union in 1999 (see Chart 11). While the slowdown in economic growth dampened M3, growth in M3 was strongly supported by emergency liquidity needs, uncertainties related to the pandemic crisis, and the very low opportunity cost of holding monetary instruments. The narrow aggregate M1, which includes the most liquid components of M3, was the main contributor to broad money growth. The annual growth rate of M1 increased by more than 2 percentage points to 10.3% in March 2020, after 8.1% in February. In addition to a strong increase in overnight deposits, the annual growth rate of currency in circulation increased substantially, to 7.0% in March, after 5.4% in February, pointing to precautionary motives in firms' and households' demand for liquidity. Firms increased their deposit holdings, which rose at an annual growth rate of 9.6% in March, up from 6.5% in February. This reflects substantial borrowing from banks, the overall ample issuance of corporate bonds, and direct liquidity support from governments. Despite a considerable reduction in the holdings of money market fund shares in March, marketable instruments made a significant, positive contribution to annual M3 growth.

Chart 11

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 monetary financial institution (MFI) loans to the private sector and MFI holdings of securities issued by the euro area private non-MFI sector. As such, it also covers the Eurosystem's purchases of non-MFI debt securities under the corporate sector purchase programme. The latest observation is for March 2020.

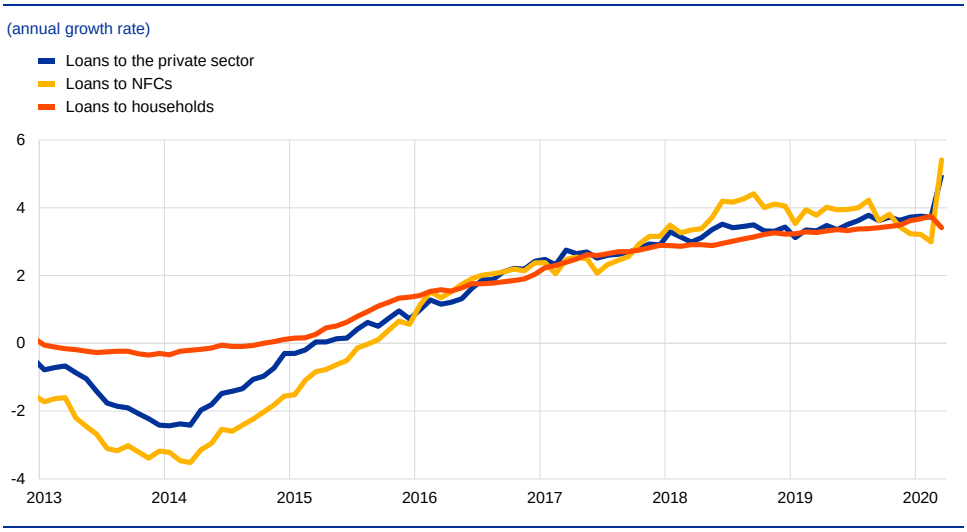
In March 2020 credit to the private sector remained the main source of money growth, followed by external monetary flows. Credit to the private sector, which has long been the main driver of M3 growth (see the blue portion of the bars in Chart 11), was behind the strong increase in M3 growth in March 2020. External monetary flows have been the second main source of money creation since October 2018 (see the yellow portion of the bars in Chart 11). These inflows reflect the interest of foreign

investors in euro area assets (in particular newly issued government securities), and have provided a significant contribution to M3 since the beginning of 2019. The ECB's net asset purchases under the pandemic emergency purchase programme (PEPP), which was launched on 18 March 2020, together with the increased purchases under its asset purchase programme (APP), made a positive contribution to M3 growth (see the red portion of the bars in Chart 11). Furthermore, the contribution of longer-term financial liabilities remained small in March 2020 (see the dark green portion of the bars in Chart 11).

Loans to the private sector also increased significantly. The annual growth rate of monetary financial institution (MFI) loans to the private sector (adjusted for loan sales, securitisation and notional cash pooling) increased to 5.0% in March 2020, after 3.7% in February (see Chart 12). This development was due to an increase in the annual growth rate of loans to non-financial corporations (NFCs) from 3.0% in February 2020 to 5.4% in March. The increase in bank lending to firms was widespread across countries. For the second half of 2020, the leading indicators of the euro area bank lending survey point to a further increase in the demand for loans to firms. By comparison, the annual growth rate for loans to households decreased somewhat from 3.7% in February 2020 to 3.4% in March. The diverging developments between firms and households in March reflect a number of factors that affected demand from the two sectors, as evidenced by the results of the bank lending survey. In addition, the fact that government policies supported the corporate sector with extraordinary, though temporary, credit support could also explain the diverging patterns. The ECB's policy measures, in particular the more favourable terms for targeted longer-term refinancing operations (TLTRO III) and the collateral easing measures, should encourage banks to extend loans to all private sector entities.

Chart 12

Loans to the private sector



Source: ECB.
Notes: Loans are adjusted for loan sales, securitisation and notional cash pooling. The latest observation is for March 2020.

The April 2020 euro area bank lending survey shows that in the first quarter of 2020 credit standards tightened somewhat for loans to enterprises and households, while firms' demand for loans surged owing to emergency liquidity

needs related to the coronavirus (COVID-19) crisis.[12] Overall, these developments reflect the deterioration in the economic outlook and the risks surrounding the COVID-19 crisis. Given that the financing needs are emergency-related, firms' loan demand was significantly higher for short-term loans than for long-term loans. The main factors underlying firms' loan demand in the first quarter of 2020 were financing needs for inventories and working capital, whereas loan demand for fixed investment and for mergers and acquisitions declined in net terms. Moreover, the deterioration in households' creditworthiness and a lower risk tolerance on the part of banks provide an explanation for the relatively stronger tightening of credit standards for loans to households and the lower net increase in demand for housing loans and consumer credit compared with demand for loans to enterprises. In addition, the decrease in consumer confidence was a key factor dampening the demand for loans for house purchase and consumer loans. For the second quarter of 2020, banks expect credit standards for firms to ease again on account of the liquidity support measures and loan guarantees introduced by governments. Although the heterogeneity of banks' replies is currently high, the results suggest that firms' loan demand will increase further, as is evident from the highest net balance since the start of the survey in 2003. For households, however, a continuation of the net tightening of credit standards and a further decrease in household loan demand were foreseen by banks. In addition, euro area banks reported that the ECB's asset purchase programmes (APP and PEPP) and the third series of targeted longer-term refinancing operations (TLTRO III) had a positive impact on their liquidity position and market financing conditions. Together with the negative deposit facility rate (DFR), these measures had an easing impact on bank lending conditions and a positive impact on lending volumes. At the same time, banks suggest that the ECB's asset purchases and the negative DFR had a negative impact on their net interest income, while the ECB's two-tier system supported bank profitability.

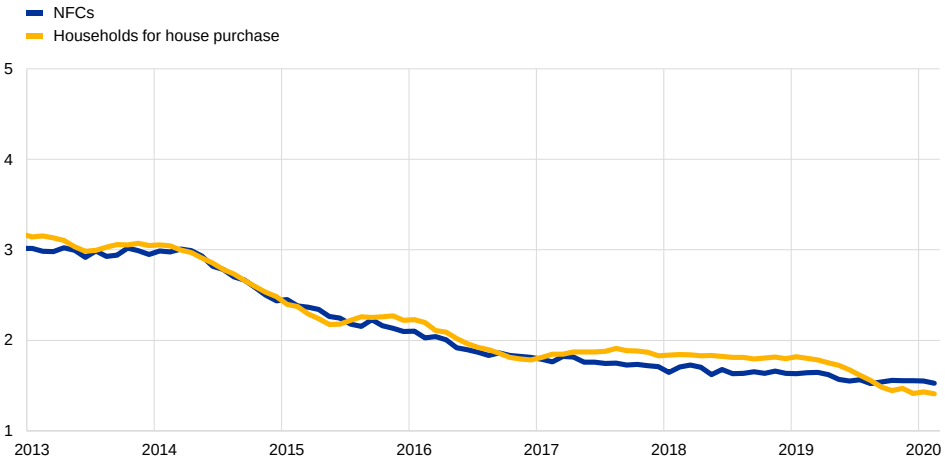
Very favourable lending rates continued to support euro area economic growth. Lending rates touched historical lows again, having declined in line with market reference rates over previous months. In February 2020 the composite bank lending rates for loans to NFCs and households declined to 1.52% and 1.41% respectively (see Chart 13). Competitive pressures, favourable bank funding costs, the APP, and the pass-through of the ECB's deposit facility rate cut in September 2019 had a further dampening effect on lending rates for loans to NFCs and households. Overall, between May 2014 and February 2020, composite bank lending rates for loans to NFCs and households fell by around 140 and 150 basis points respectively.

[12] In the first quarter of 2020, the net percentage of banks reporting a tightening of credit standards (i.e. banks' internal guidelines or loan approval criteria) for loans or credit lines to firms was 4%, whereas the net tightening was 9% for loans to households for house purchase and 10% for consumer credit and other lending to households.

Chart 13

Composite bank lending rates for NFCs and households

(percentages per annum)



Source: ECB.
Notes: Composite bank lending rates are calculated by aggregating short and long-term rates using a 24-month moving average of new business volumes. The latest observation is for February 2020.

Boxes

1 Alternative scenarios for the impact of the COVID-19 pandemic on economic activity in the euro area

Prepared by Niccolò Battistini and Grigor Stoevsky

The outbreak of the COVID-19 pandemic has dramatically affected global economic activity since early 2020. The rapid spread of the novel coronavirus (COVID-19) has required drastic measures to be taken, ranging from social distancing and the banning of public events to shutdowns, lockdowns and restrictions on numerous activities. The severity of these measures has begun to ease in some jurisdictions, as authorities are proceeding to gradually lift them and reopen certain sectors of the economies. Nevertheless, there could still be a prolonged period of social distancing and other containment measures in force for some time. These containment measures have weighed on supply and – together with increased uncertainty and self-isolation by individuals due to the rapid spread of the disease – have also induced households and firms to retrench their spending, thereby reducing aggregate demand. Widespread closures of firms have triggered a marked deterioration in employment conditions, an increase in firms' liquidity needs, and pronounced financial market disruptions. Despite the shortage of timely hard data, it is already clear that there has been a decline in economic activity of an unprecedented magnitude.

The high uncertainty surrounding the economic impact of the COVID-19 pandemic warrants an analysis based on alternative scenarios. There are high uncertainties surrounding the developments of the pandemic, the need for and effectiveness of containment measures, and the possible emergence of medical treatments and solutions. These uncertainties can be illustrated through a scenario analysis, based on broad narratives for the aforementioned factors and their economic impact. It should be noted that these are illustrative scenarios compiled by ECB staff and, as such, they should not be seen as an indication of the forthcoming June 2020 Eurosystem staff macroeconomic projections for the euro area and thus they do not pre-empt in any way that projection exercise. Moreover, this box focuses only on economic activity, while the forthcoming June 2020 Eurosystem staff macroeconomic projections will be a fully-fledged projection exercise, including a detailed assessment of the inflation outlook.

This box presents three alternative scenarios to illustrate the range of likely impacts of the COVID-19 pandemic on the euro area economy. The scenarios vary according to a number of factors, namely the duration of the strict lockdown measures and their impact on sectoral economic activity, the economic effects of protracted containment measures during a post-lockdown transition period, the behavioural responses by economic agents to minimise economic disruptions, and the longer-lasting effects for economic activity once all containment measures have been lifted. This scenario analysis for the euro area is based on the same broad narratives

for the global economy (and thus for the euro area foreign demand), while it abstracts from further feedback loops related to financial market disruptions or long-term implications of persistently high unemployment.

The different assumptions underlying the three illustrative alternative scenarios imply a range spanning from mild to severe expected economic impact. In the first (*mild*) scenario, strict lockdown and further containment measures, as well as rapid advances in medical treatments, entail relatively short-lived strict lockdown periods (ending in the course of May 2020), a gradual return to normal activity thereafter and only temporary economic losses. In the second (*medium*) scenario, a short-lived strict lockdown period (also ending in the course of May 2020) is followed by relatively stringent and protracted containment measures, implying a delayed return to normal activity, as well as persistent output losses. In the third (*severe*) scenario, a longer-term strict lockdown period (ending in the course of June 2020) has only limited success in containing the spread of the virus, thus requiring ongoing tough containment measures to remain in place even after some loosening of the very strict lockdowns. The sustained efforts to prevent the spread of the virus would continue to significantly dampen activity across sectors of the economy until a vaccine (or another effective medical solution) were to become available. This is not expected to occur until around mid-2021. Therefore, this scenario envisages significant and permanent output losses.

Containment measures during the lockdown periods have a diverse impact across economic sectors in the euro area. The collapse in activity is initially the strongest for services, particularly those related to travel and recreational activities. This has already been indicated by some of the available survey evidence. However, the lockdown measures and the ensuing supply bottlenecks reduce production dramatically, also across large segments of the industry. Overall, the containment measures are assumed to cause a relatively larger loss of value added in retail trade, transport, accommodation and food service activities compared to manufacturing, construction and other sectors (see Table A). The sectoral breakdown is indicative and based on anecdotal evidence and available survey evidence. It helped derive economy-wide estimates for the likely economic losses, which are broadly in line with available estimates from other institutions. The total initial economic loss implied during the lockdown is estimated to amount to around 30% – depending on the country – of value added relative to the normal level of activity. On account of agents' responses aimed at minimising economic disruptions, the total initial economic losses are assumed to decline in the course of the second quarter of 2020. Under the assumptions used for these illustrative scenarios, the marginal impact of an additional month of lockdown measures on the annual GDP level is initially, approximately, between 2 and 2½ percent.

Table A

Initial sectoral losses due to strict lockdown measures

(percentage of gross value added)

Sector	Loss
Agriculture	10
Industry (excl. manufacturing and construction)	40
Manufacturing	40
Construction	40
Retail trade, transport, accommodation, food service activities	60
Information, communication	10
Financial and insurance activities	10
Real estate activities	20
Professional, scientific, administrative and technical activities	30
Public administration	10
Arts, entertainment, recreation and other activities	30

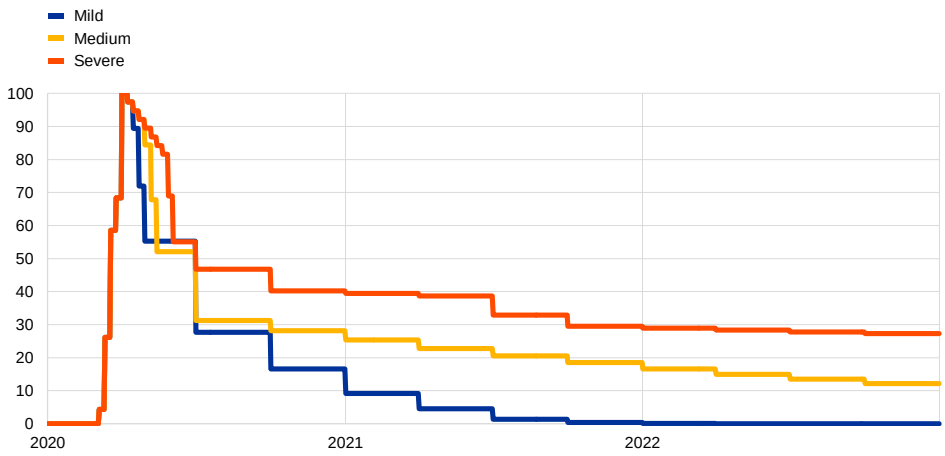
Source: ECB staff.
Note: Under these scenarios, the lockdown is assumed to have a softer sectoral impact (by around 20-30%) in the course of the second quarter of 2020 on account of agents' reaction (behavioural response) to minimise economic disruptions.

Strict containment measures are expected to severely affect economic activity in the euro area well beyond the short-term horizon. The sectoral approach used to assess the economic losses associated with the COVID-19 pandemic allows for the calculation of a time profile of indicative losses (as a percentage of maximum sectoral losses) implied by the virus containment measures in the euro area under the three alternative scenarios (see Chart A). The maximum sectoral losses (including direct and carry-over impacts) are assumed to occur in the first week of April 2020. The economic losses due to lockdowns began to build up in March – as different countries enforced lockdown measures – and after reaching a peak at the beginning of April, they are expected to decline to close to 50% of their maximum level by mid-May, end-May and in the course of June under the mild, medium and severe scenarios, respectively, as looser containment measures allow for a gradual restart of economic activity. While containment measures – coupled with the longer-lasting costs inflicted on activity stemming from the pandemic – are expected to exhaust their negative impact by end-2021 under the mild scenario, they would continue to weigh on economic activity in 2022 under the medium and severe scenarios.

Chart A

Time profile of indicative losses in gross value added implied by containment measures in the euro area under the mild, medium and severe scenarios

(percentage of maximum euro area sectoral loss)



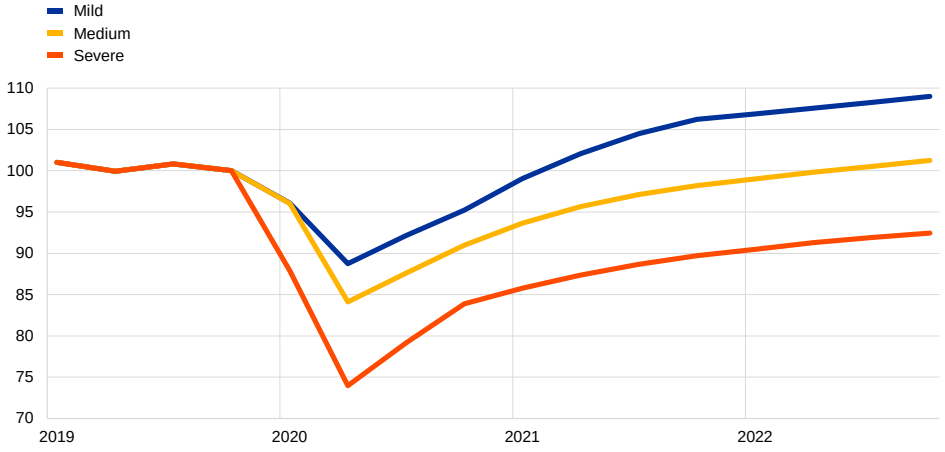
Source: ECB calculations.
Note: Losses are measured relative to the maximum sectoral losses for the euro area, computed as a weighted average of the losses for the largest five euro area countries.

The containment measures enforced by countries worldwide severely affect global economic activity and strongly curtail global trade. Similarly to the euro area, three illustrative scenarios are also considered for global real GDP excluding the euro area and euro area implied foreign demand of goods and services (see Chart B). The COVID-19 pandemic and its fallout implies large losses for global real GDP. As a result of the high procyclicality of global trade with respect to global activity, euro area foreign demand would fall by around 7%, 11% and 19% under the mild, medium and severe scenarios, respectively, in 2020. Looking further ahead, losses in euro area foreign demand compared to its end-2019 level are likely to persist only under the severe scenario up to the end of 2022.

Chart B

Euro area foreign demand under the mild, medium and severe scenarios

(index, 2019 Q4 = 100)

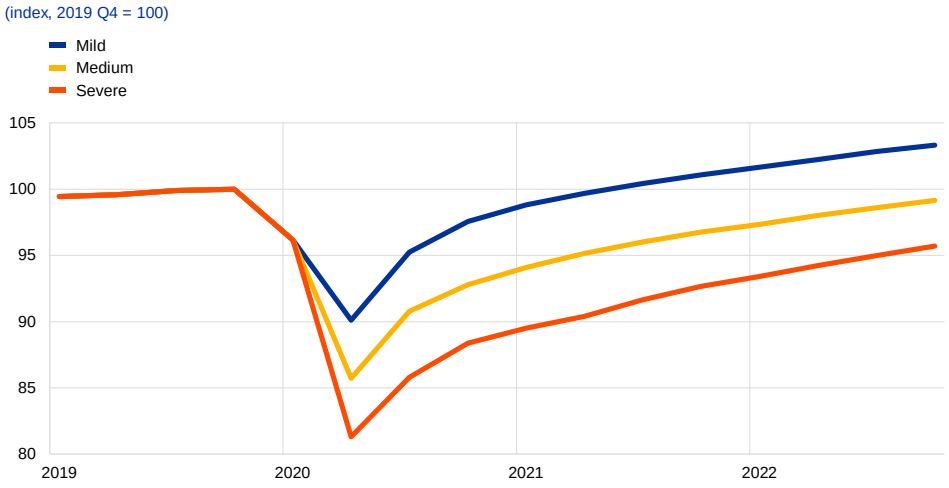


Source: ECB calculations.

Euro area real GDP is expected to drop sharply in the short term, while effective containment measures would be crucial to ensuring a robust recovery thereafter. The scenario analysis used in this box points towards an unprecedented contraction in economic activity, with real GDP plummeting by around 5%, 8% and 12% under the mild, medium and severe scenarios, respectively, in 2020 (see Chart C). The annual figure under the severe scenario reflects a quarterly real GDP growth reaching a trough of around -15% in the second quarter of 2020, followed by a protracted and incomplete recovery, entailing quarterly growth rates of around 6% and 3%, respectively, in the third and fourth quarters of 2020. As containment measures allow for a gradual normalisation of economic activity, real GDP is expected to increase by around 6%, 5% and 4% under the mild, medium and severe scenarios, respectively, in 2021. The uncertain epidemiology of the virus, the expected diverse effectiveness of containment measures and the assumed persistent economic damage under the medium and severe scenarios would continue to weigh on the economic recovery throughout the horizon. Under the severe scenario, in particular, real GDP is expected to remain well below the level observed at the end of 2019 until the end of 2022.

Chart C

Euro area real GDP under the mild, medium and severe scenarios



Source: ECB calculations.

These illustrative scenarios abstract from a number of other relevant factors that would also influence the magnitude of the recession in the euro area. The scenarios are built on the assumed containment by economic policy measures of prospective negative real-financial feedback loops. In addition, they do not include other non-linear amplification mechanisms due to extreme events, such as severe losses to household income and persistently high unemployment as a result of an increase in bankruptcy rates in the corporate sector. Furthermore, these scenarios have been prepared under the usual assumption applied in ECB and Eurosystem staff macroeconomic projections for monetary policy, which is to take the same path for interest rates already reflected in market developments under all three alternative scenarios. Finally, the three scenarios take into account the fiscal measures that have recently been announced by euro area countries. Under the severe scenario, the

prospective fiscal responses have been scaled up to better reflect the expected stronger economic severity of lockdown measures.

Given the unprecedented uncertainty surrounding the developments and economic impact of the COVID-19 pandemic, the assessments underlying these illustrative scenarios need to be continuously updated. The results of the analysis presented in this box crucially depend on the underlying assumptions. These include the (direct and indirect) effects of lockdown and other containment measures on global and domestic supply and demand forces, as well as the effectiveness of policy responses worldwide in containing the spread of the virus and in supporting economic activity. Ultimately, rapid and decisive containment and economic policy measures – besides an effective medical solution – will be crucial to ensuring a robust recovery of economic activity in the euro area. While this box focuses on the impact of the COVID-19 pandemic on economic activity in the euro area, the implications for consumer price inflation depend on the balance between demand and supply factors and, as mentioned, this will be assessed in the forthcoming June 2020 Eurosystem staff macroeconomic projections.

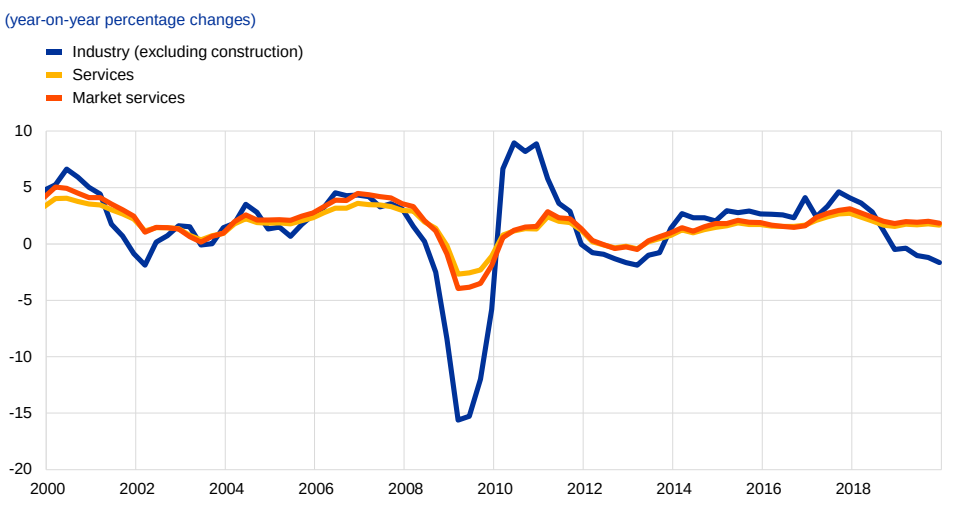
2 The fall in manufacturing and services activity in the euro area: foreign versus domestic shocks

Prepared by Roberto A. De Santis

The coronavirus (COVID-19) pandemic, which has brought human suffering and disruption in economic activity globally, has affected manufacturing and services activity in all euro area countries. Economic growth in the euro area will be severely undermined in the short term. Three concomitant developments have adversely affected economic growth in the euro area since the beginning of 2018: (i) a weakening in global trade, related in part to rising international trade tensions and persistent policy uncertainty surrounding Brexit; (ii) a fall in automotive production, mainly owing to a decline in foreign demand as well as the introduction of more stringent environmental regulations in Europe; and (iii) a severe drop in economic activity as a result of the coronavirus. Between January 2018 and February 2020, despite the weakness in manufacturing in the euro area, the services sector as a whole – in particular market services – remained relatively resilient (see Chart A). In March, however, economic activity in both sectors fell sharply owing to the pandemic. Survey-based indicators such as the Purchasing Managers' Index (PMI) (see Charts B and C), business and consumer sentiment indicators, and other more timely statistics such as international air travel and energy consumption, all point to a severe downturn in both manufacturing and services in the euro area as well as in many other countries.

Chart A

Real value added in industry and services

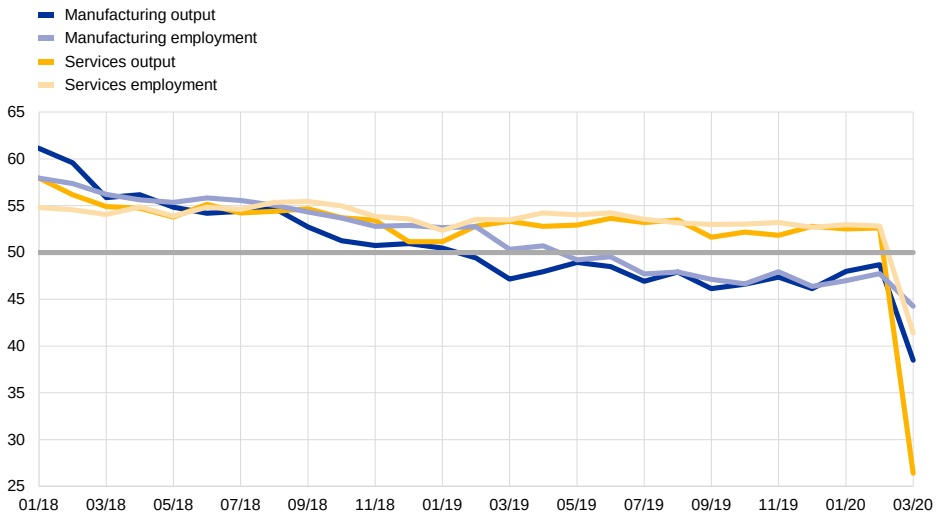


Source: Eurostat.
Note: The latest observation is for the fourth quarter of 2019.

Chart B

Output and employment PMIs for euro area manufacturing and services

(diffusion indices: 50 = no change, <50 = contraction; >50 = expansion)

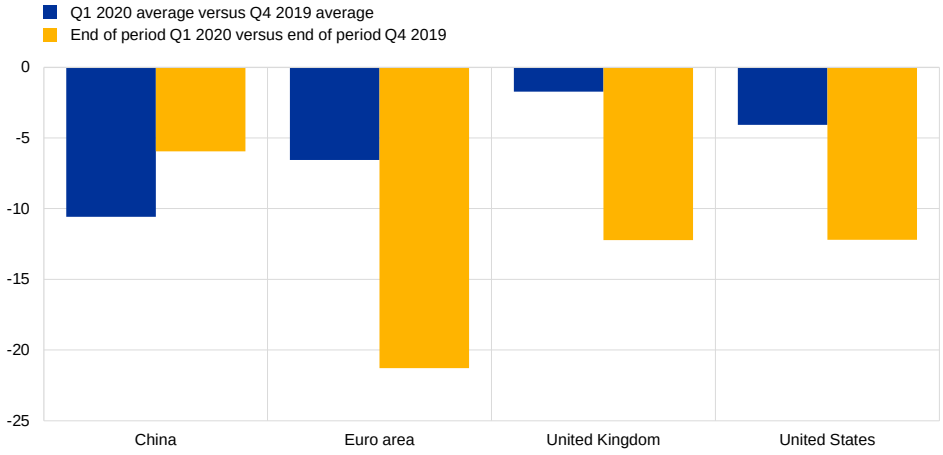


Source: Markit.
Note: The latest observation is for March 2020.

Chart C

Composite PMI developments across selected economies in the first quarter of 2020

(change in the diffusion index)



Source: Markit and ECB calculations.
Note: The blue bars show the difference between the average monthly figure recorded in the first quarter of 2020 and the average monthly figure recorded in the fourth quarter of 2019. The yellow bars show the difference between the figures for March 2020 and December 2019.

A model covering manufacturing and services activity in a number of large economies is used to assess the importance of foreign and domestic factors for the euro area economy in three different periods: 2018, January 2019 to February 2020, and March 2020. PMI indicators are the first major survey indicators, harmonised across countries, to provide evidence of a sharp drop in economic activity in March 2020 across the globe. Therefore, in order to capture the effects of coronavirus outbreak, the model uses monthly PMI values for manufacturing output and services output for the euro area, China, the United Kingdom and the United

States. It is estimated over the sample period January 2007 to March 2020, partly because the economic relationships between countries may have been different before the Great Recession in 2008-09, but also to include data for China. The model also controls for a global trade factor, which is proxied by the PMI for world new export orders. To give more prominence to this global factor, it is assumed to only react with a lag to shocks generated by manufacturing and services output in individual countries, while economic activity in each country reacts to global trade shocks contemporaneously. All the other eight variables are modelled assuming that a shock has an instantaneous effect on the variable that originated it which is larger in absolute value than its effect on other variables.[13]

The econometric evidence corroborates the view that both foreign and domestic shocks to manufacturing activity play a key role in explaining the downturn in economic activity in the euro area between January 2018 and February 2020. The model results suggest that the foreign factor was the key reason for the weakness of manufacturing activity in the euro area in the first half of 2018, but since the summer of 2018 shocks which can be attributed to specific developments in the automotive sector have also played a central role. According to the econometric results, 53% of the decline in manufacturing activity in 2018 is attributable to domestic factors (see Chart D). The evidence from PMIs corroborates the econometric results reported in the Economic Bulletin in September 2019 with the aim of explaining the drivers behind the fall in euro area industrial production growth at that time.[14] The stabilisation in the manufacturing output PMI recorded between January 2019 and February 2020 seems due to foreign developments, while domestic factors continued to be a drag on manufacturing activity. On the supply side, the introduction of certain environmental regulations in the EU caused temporary supply disruptions in the automotive industry. Some large car producers increased their efforts to raise local production and sales of electric cars. However, the required changes in factories may have entailed temporary production shortfalls. On the demand side, uncertainty about the diesel ban in some euro area countries caused a fall in demand for diesel cars and a switch to petrol cars, in part imported from countries outside the euro area. The automotive industry accounts for a large part of developments in capital goods and intermediate goods, as it is highly interconnected across sectors and countries.[15] It remains to be seen to what extent such temporary and structural domestic factors, which have played a role in the weakness of euro area manufacturing activity in the recent past, may also affect the recovery in this sector in the future.

Services have also been negatively affected by foreign and domestic developments in manufacturing, given the relatively strong link between production in the car industry and certain services sectors, although the services sector was more resilient up to February 2020. The model results

13. The shock identification method is explained in De Santis, R. A. and Zimic, S, "Spillovers among sovereign debt markets: Identification through absolute magnitude restrictions", *Journal of Applied Econometrics*, Vol. 33, No 5, 2018, pp. 727-747.

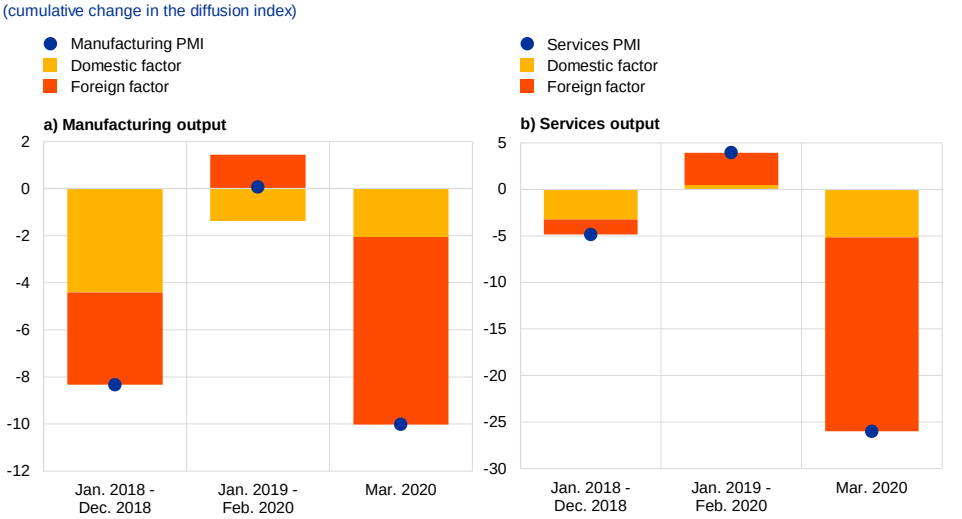
14. See the box entitled "Domestic versus foreign factors behind the fall in euro area industrial production", *Economic Bulletin*, Issue 6, ECB, 2019. The model described in the current box has characteristics which are very similar to those of the model in Issue 6, 2019. It replaces industrial production with PMI manufacturing output and adds PMI services output for the four economies.

15 See also, "The impact of the car industry slowdown from a global value chain perspective", *Economic Bulletin*, No 2, Banco de España, 2019, pp. 1922.

suggest that negative spillovers from manufacturing to services can be significant. Services can be negatively affected via the relatively strong links between production in the car industry and consumer finance and retailers. At the same time, the services sector as a whole has remained more resilient than manufacturing, since it was affected less by developments in the car industry and benefited, like all sectors, from favourable financing conditions. The services output PMI started to decline from the second quarter of 2018, initially owing to global trade developments, which affected manufacturing directly and services indirectly, but then rose between January 2019 and February 2020 for the same reason. However, activity will be significantly affected by the containment measures introduced to fight the coronavirus as well as the policy response.

Chart D

Drivers of the euro area manufacturing and services PMIs – domestic versus foreign factors



Sources: Markit and ECB calculations.
Note: Shocks to countries' PMI manufacturing/services activity are identified using the absolute magnitude restriction method (see De Santis, R.A. and Zimic, S., op. cit.).

The sharp drop in the PMI indices in March 2020, particularly in services, is unprecedented. Given the spread of the coronavirus across countries, it is reasonable to argue that output in March 2020 was driven by a global shock. Although services are less trade-intensive, they have become strongly correlated globally owing to the pandemic and the common measures which have been taken to contain it, namely the adoption of social distancing policies, as also recommended by the World Health Organization. The econometric model attributes a large fraction of the collapse in the manufacturing and services output PMIs for the euro area in March to the foreign factor, which is likely to reflect the fall in global trade and the lagged impact of the global slowdown given the sharp drop in economic activity in China in February. It is worth pointing out, however, that the euro area domestic factors also account for a significant part of the decline in both sectors in March 2020.

All in all, the pandemic outbreak is causing a broad-based fall in euro area economic activity. Between January 2018 and February 2020, domestic factors

contributed to a large share of the decline in manufacturing activity, reflecting temporary and structural factors linked to the car industry. The marked weakness in manufacturing activity fed into some sub-components of services, but overall the services sector withstood this negative shock. Economic activity in the euro area fell sharply in March 2020, as a result of the spread of the virus and measures implemented to contain it. Many countries around the world have introduced measures since March 2020, and the economic outlook will continue to be affected by the evolution of the pandemic, the associated containment measures and the policy response. At the current juncture, therefore, the economic outlook remains highly uncertain.

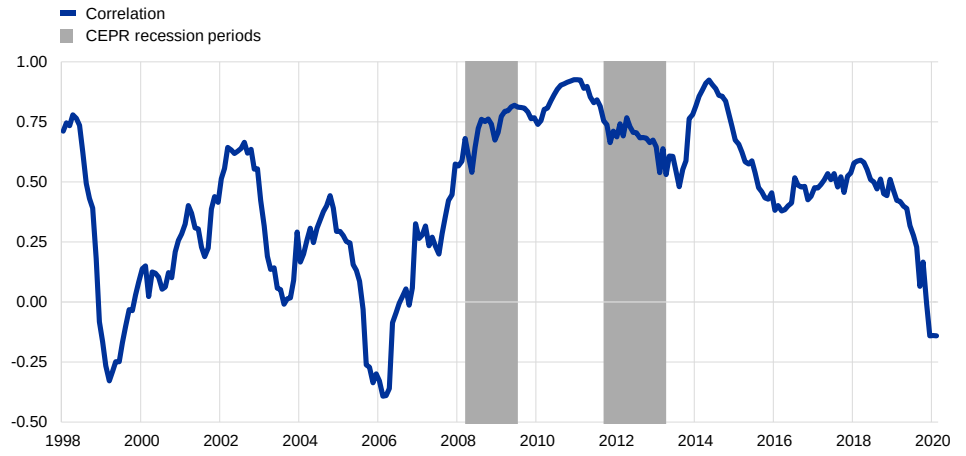
3 Disentangling aggregate and sectoral shocks

Prepared by Maarten Dossche and Stylianos Zlatanos

The growth slowdown in 2018-2019 was characterised by a marked divergence of industrial production and retail sales. Activity in both sectors is usually characterised by positive co-movement, particularly during recessions.[16] However, there are also episodes where the correlation between the growth of industrial production and retail sales is low or even turns negative (see Chart A). Despite a strong contraction in industrial production, retail sales barely slowed in 2018-2019. This box uses this co-movement to uncover whether the euro area economy was hit by aggregate or sectoral shocks. It then tries to understand whether these two shocks differ in their impact on output over time. The recent COVID-19 shock is undoubtedly an aggregate shock, hitting industrial production and retail sales simultaneously. Yet its impact on economic activity over time remains uncertain as its characteristics differ substantially from past aggregate shocks.

Chart A

Rolling correlation of industrial production and retail sales



Sources: Eurostat and authors' calculations.
Notes: The correlation between year-on-year growth in industrial production and retail sales is based on a 12-month rolling window. Grey bars refer to the recession periods as defined by the Centre for Economic Policy Research. The latest observation is for February 2020.

Consumer theory can help to identify aggregate and sectoral shocks. The permanent income hypothesis (PIH) predicts that only unexpected permanent (or persistent) shocks to aggregate income (or production) affect private consumption, whereas transitory shocks do not.[17] At the sectoral level, the PIH implies that transitory shocks should only affect industrial production and not retail sales (i.e. consumption), while permanent shocks should affect activity in both sectors. This difference can be used as a short-run zero identifying restriction in a tri-variate

16 Positive co-movement between retail sales and industrial production plays a prominent role in the NBER's recession dating procedure. It is also the centrepiece of Burns and Mitchell's definition of business cycles, see Burns, A. and Mitchell, W., "Measuring Business Cycles", *NBER Studies in Business Cycles*, No 2, National Bureau of Economic Research, 1946.

17 See also the literature review in Jappelli, T. and Pistaferri, L., "The Consumption Response to Income Changes", *Annual Review of Economics*, Vol. 2, 2010, pp. 479-506.

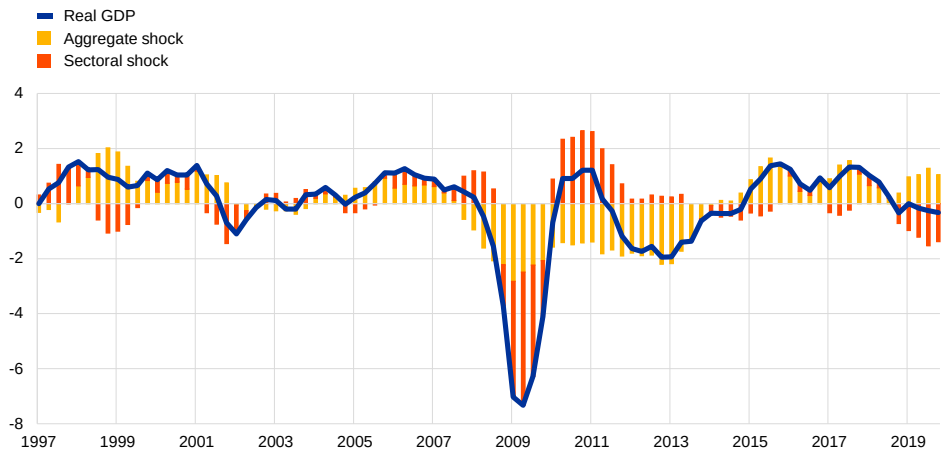
structural vector auto-regression model with retail sales, industrial production and GDP growth.[18]

The identifying assumption is reminiscent of the literature on sectoral and aggregate shocks. Positive co-movement across sectors is not a sufficient condition for a shock to be classified as "aggregate".[19] Owing to input-output linkages, both aggregate and sectoral shocks can have similar implications for different sectors. In line with a large swathe of the empirical literature, the short-run zero restriction ensures that the conditional correlation between retail sales and industrial production is zero on impact in the case of a sectoral shock to industrial production.[20]

Chart B

Historical decomposition of GDP growth

(year-on-year percentage point deviations from average)



Sources: Eurostat and authors' calculations.
Notes: Computations based on a tri-variate structural vector auto-regression with retail sales, industrial production and GDP growth using a short-run zero restriction on retail sales. The estimation sample covers the period from the first quarter of 1995 to the fourth quarter of 2019.

Aggregate shocks have a more persistent impact on economic activity than sectoral shocks. The historical decomposition of GDP in Chart B suggests that most of the 2018-2019 slowdown in GDP growth can be explained by a series of adverse sectoral shocks (e.g. trade tensions and environmental issues in the transport sector). Chart C shows that the response of GDP to aggregate shocks is usually more persistent than its response to sectoral shocks. As GDP growth turns quickly positive after an adverse sectoral shock, this implies that once the (transitory) effects dissipate, industrial production typically converges back to retail sales (and not vice versa).

18 The weak implementation of the identifying assumption implies that if not all conditions are met for the PIH to hold true (e.g. credit-constrained households leading to excess sensitivity), the timing assumption still allows aggregate and sectoral shocks to be disentangled.

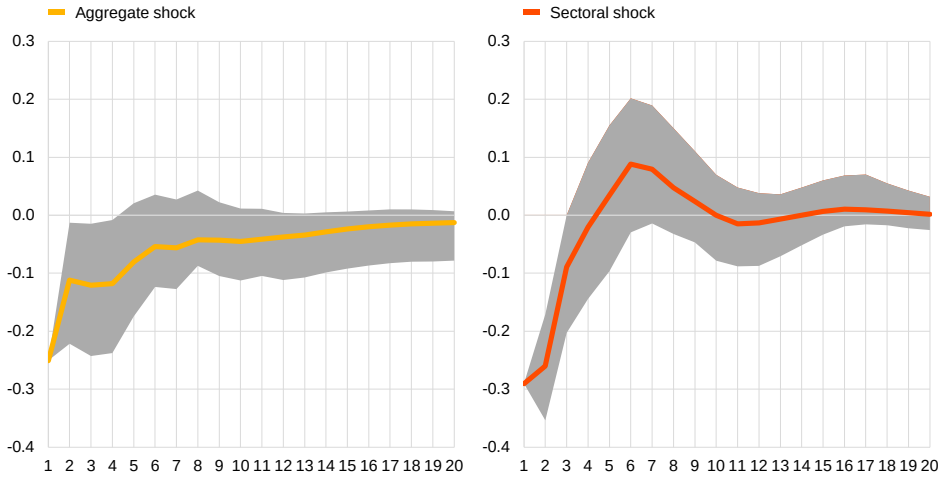
19 See Long, J. and Plosser, C., "Sectoral vs. Aggregate Shocks In The Business Cycle", *American Economic Review*, Vol. 77, No 2, 1987, pp. 333-336.

20 See, for example: Atalay, E., "How Important Are Sectoral Shocks?", *American Economic Journal: Macroeconomics*, Vol. 9, No 4, 2017, pp. 254-280; Foerster, A., Sarte, P.-D. and Watson, M., "Sectoral versus Aggregate Shocks: A Structural Factor Analysis of Industrial Production", *Journal of Political Economy*, Vol. 119, No 1, 2011, pp. 1-38; Forni, M. and Reichlin, L., "Let's Get Real: A Factor Analytical Approach to Disaggregated Business Cycle Dynamics", *The Review of Economic Studies*, Vol. 65, No 3, 1998, pp. 453-473; and Jimeno, J., "The relative importance of aggregate and sector-specific shocks at explaining aggregate and sectoral fluctuations", *Economics Letters*, Vol. 39, No 4, 1992, pp. 381-385.

Chart C

Impulse responses of GDP growth

(percentage point deviation from average; quarter-on-quarter percentage changes)



Sources: Eurostat and authors' calculations.
Notes: Impulse responses reflect a negative shock and are derived from a tri-variate structural vector auto-regression with retail sales, industrial production and GDP growth using a short-run zero restriction on retail sales. The estimation sample covers the period from the first quarter of 1995 to the fourth quarter of 2019. Shaded areas reflect 90% confidence intervals.

The COVID-19 shock differs substantially from a typical aggregate shock. The co-movement between retail sales and industrial production should strengthen again, as both manufacturing and retail sales can be expected to contract from March 2020 onwards. As there are large differences between the characteristics of the COVID-19 shock and those of past aggregate shocks, the above framework is not necessarily well suited to studying the propagation of the COVID-19 shock. In the medium term its impact will depend on various factors, in particular the length of the lockdowns and the effectiveness of the policies mitigating the fallout for households and firms.

4 Inflation measurement in times of economic distress

Prepared by Omiros Kouvavas, Riccardo Trezzi, Bernhard Goldhammer, and Jakob Nordeman

The Harmonised Index of Consumer Prices (HICP) is compiled on the basis of consumption weights that are kept constant within a given calendar year. This reflects the index's purpose of measuring pure price changes without accounting for adjustments in consumption patterns. In times of sharp economic contraction such as those triggered now by the coronavirus (COVID-19) pandemic, such adjustments can occur over shorter horizons. This box explains inflation measurement issues both in the context of general economic downturns and in the current situation triggered by the COVID-19 shock.

The extent to which consumers will adjust their consumption patterns in response to the COVID-19 crisis is surrounded by considerable uncertainty. According to the ECB analysis, the euro area's real GDP is expected to contract by between 5% and 12% in 2020, according to three assumed scenarios.[21] Policy responses will, to some extent, mitigate the recessionary effects on household disposable incomes. Nevertheless, the impact on income and the increased uncertainty will most likely trigger significant changes in household consumption patterns. Moreover, the direct effects of the lockdown measures have already had an impact on consumption patterns, with some goods and services becoming temporarily unavailable.

Households adjust consumption patterns in response to income and relative price shocks. For instance, when facing a reduction in disposable income, consumers tend to switch away from relatively more expensive to relatively less expensive goods or switch more strongly to "necessities".[22] This substitution happens across items and categories (e.g. food versus recreation) as well as across varieties within items (different brands of the same product).[23] In extreme circumstances, consumers may even stop buying certain goods and services if their budget constraint becomes binding. However, the HICP does not reflect such imminent and possibly temporary shifts. Its inflation numbers therefore tend to be higher than the increase in

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21 See the three scenarios for the impact of COVID-19 on real activity shown in the box entitled "Alternative scenarios for the impact from the COVID-19 pandemic on economic activity in the euro area" in this issue of the Economic Bulletin.

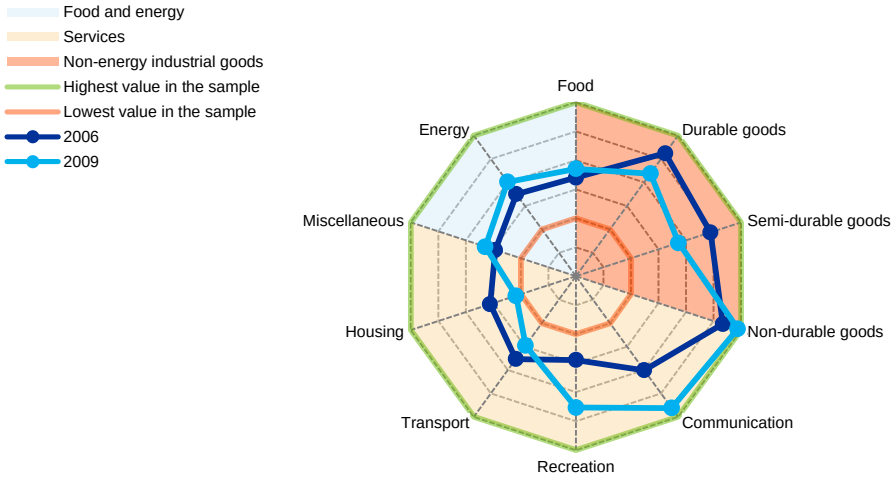
22 Additionally, a reduction in income may increase the extent that a household switches within product categories, creating measurement challenges. For example, assuming that the price of product X (the higher-quality product) falls faster than that of product Y (the lower-quality product) would normally suggest a shift in expenditure shares towards product X. However, if income constraints become binding, then consumers may switch to products or items with lower prices (product Y) even if their relative price has increased. Such switches and substitution does not apply only to products but also to outlets.

23 See for example studies based on micro-level and scanner data from Coibion, O., Gorodnichenko, Y. and Hong, G. H., "The Cyclicality of Sales, Regular and Effective Prices: Business Cycle and Policy Implications", *American Economic Review*, Vol. 105, No 3, pp. 993-1029, March 2015, for a comparison on observed and effective prices in the US, or Kouvavas, O., "Trading Down and Inflation", *Unpublished manuscript*, 2019, on the changes of the products consumed with respect to their quality during business cycles and the impact on effective prices versus aggregate statistics. Both studies estimate the bias that leads to an increased cyclicality of effective prices.

total household expenditure inflation, as households practise substitution, opting for less expensive items.[24]

Chart A

Euro area HICP weights adjustment during the 2008-2009 downturn



Sources: Eurostat and author's calculations.
Note: The chart shows the HICP weights for each category at different points in time. For each category, the weights are normalised so that the inner circle represents the lowest (weight) value since 2001 and the outer ring represents the highest (weight) value since 2001.

Past episodes of economic distress provide evidence for changes in consumption weights. Taking the 2008 financial crisis as an example, Chart A shows the weights across main HICP categories at two different points in time, normalised so that the inner and outer circles capture the minimum and maximum values for each category in the sample in the period 2001 to 2020.[25] The recession episode saw lower expenditure shares for durable and semi-durable goods as well as housing and transport services, while shares for recreation and communication as well as energy, food and non-durable goods increased.[26]

At the current juncture, household consumption is affected by supply-side constraints, such as closure of retailers or scarcity of products on the shelves. High-frequency data suggests that the expenditure changes triggered by the current

[24] It should be noted that some euro area countries- notably Belgium and the Netherlands, already make use of scanner data with a formula that captures changes in the quantities of product items sold. As an example, see Chessa, A., "A new methodology for processing scanner data in the Dutch CPI", EURONA 1, pp. 49-69, July 2016.

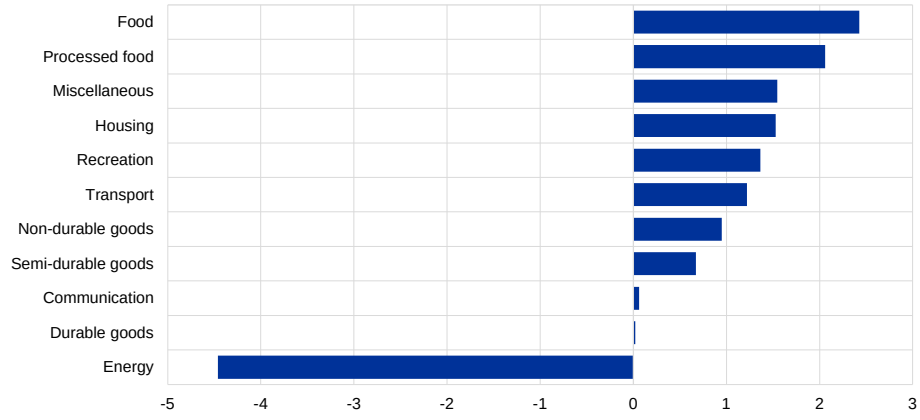
[25] A limitation to this analysis is that before 2010, HICP weights were only updated every five years in some countries and with a considerable delay (for example, for Germany, only three years later, so weights representing the base year 2000 were introduced in 2003 and used until 2008). For this reason, we checked the evidence presented in Chart A using the weights of the personal consumption deflator (PCD) rather than the HICP. Overall, the evidence in Chart A was largely confirmed by the PCD weights.

[26] The weights presented in Chart A are an ex post reflection of expenditure changes as recorded in Eurostat weights for the year 2009. In practice, they might underestimate changes in real-time expenditure shares and could be interpreted as a lower boundary given the timing of the weights adjustment, especially during a severe downturn.

crisis might imply weights for individual categories outside the historical boundaries.[27] For example, as a result of the lockdown, consumption has moved away from energy, durable and semi-durable goods in favour of non-durable goods and food items. Potentially, these changes in consumption patterns are unprecedented but most likely also temporary. In Chart A, this could imply that the weight for food items based on consumption patterns during the lockdown could lie on the outer edge of the graph for most categories, as it would be at the upper boundary of its historical range. Similarly, the implied weight for recreation based on consumption data for services like restaurants, cafes and holiday items would lie at the inner edge of the historic weight developments. Having said this, the actual household consumption profile for the current year remains underpinned by a high degree of uncertainty.[28]

Chart B

Heterogeneity of euro area HICP items' inflation rates



Sources: Eurostat and author's calculations.
Note: The chart shows the latest available year-on-year inflation rate in each HICP subcategory. Data are until end-March.

When inflation rates differ across sub-categories, accounting for changes in consumption weights would play a role in the aggregated HICP inflation. Given that HICP sub-categories typically show different inflation rates, switching from HICP items with high inflation rates to those with low ones (or vice versa) would affect the profile of aggregate inflation rates if the switching were taken into account.[29] Chart B shows the heterogeneity in inflation rates in each sub-category in March 2020.

27 For services, see data from the OpenTable page entitled "The state of the restaurant industry". Additionally, see data from the following: "Then and now: consumer CPG behavior during economic downturns", IRI Consumer Spending Tracker, March 25, 2020, and "Italy provides insights into a new normal", IRI report, April 8, 2020. For the US case, see for example Baker et al., "How Does Household Spending Respond to an Epidemic? Consumption During the 2020 COVID-19 Pandemic", NBER working paper, April 2020, or "Tracking the unprecedented impact of COVID-19 on U.S. CPG shopping behavior", Nielsen report, March 2020. See also Carvalho et al., "Tracking the COVID-19 Crisis with High-Resolution Transaction Data", BBVA working paper No 20/06, April 2020.

28 Consumers might face – at least in the short term – some shortage of items and possibly higher prices. Switching might depend on variety availability in certain item categories leading to higher relative expenditure on higher qualities or prices. This happens when the demand for a product category exceeds supply, leading to all varieties being sold out, which has an impact on the average composition of cheap to expensive varieties sold.

29 In the HICP, weights are updated annually in February with the January release of the index. The weights for year "t" are based on national accounts' data from year t-2 (the last available full year at the time of their release), which are updated to reflect the consumption pattern of year t-1. See "Harmonised Index of Consumer Prices – Methodological Manual", Eurostat, November 2018.

Currently, the sub-category posting the highest inflation rate is food, with energy seeing the largest contraction. Additionally, prices will respond endogenously to demand conditions; therefore, switching to or from a category might increase or decrease its inflation rate, respectively. For example, in the current situation, an increased demand for food or pharmaceutical items might lead to an additional increase in their prices.

The restrictive measures implemented by European governments in reaction to COVID-19 – such as closures of shops or travel restrictions – also have a direct impact on price collection. The lockdown disrupted the collection of prices needed to compile the HICP in several countries, sometimes even when outlets remained open.[30] The HICP framework mandates the imputation of missing prices, which may be done either by referring to other price indices from the same or a higher product category (as far up as the all-items level) or by carrying forward prices that were actually collected in a previous month.[31] Seasonality in price indices may be imputed by referring to the seasonal profile from the previous year. Eurostat and the national statistical institutes provide metadata on the imputation methods applied and a list of the sub-indices affected. In terms of expenditure shares, 4.8% of price indices[32] for the March euro area HICP are labelled as being of "low reliability". This percentage is expected to increase in April.[33] Metadata already published by Eurostat in the flash estimate of 30 April show that 35% of the prices of the euro area HICP were imputed.[34]

The imputations will increase the relative importance of the reliable indices in the HICP. Their weight is implicitly increased if missing items are imputed using either other single sub-indices or aggregates thereof. The HICP figures will therefore be driven by aggregate sub-indices for which there is a reasonable hypothesis that sales have continued and for which the underlying prices are largely based on actual transactions, like food (19.1%) and energy (9.8%), which together account for about 29% of the total HICP basket. These two categories accounted for most of the variance in the HICP in the last couple of years.[35] Other categories that could provide reliable information are communication services and rents as they may have been less affected by the lockdown. On top of these compilation issues, the possibility that some specific items show large price changes because of supply shortages cannot be ruled out. Overall, the impact of price collection issues on the HICP cannot be anticipated and upcoming HICP releases should be interpreted with caution.

The COVID-19-related economic developments pose challenges for inflation analysts. HICP aggregations will be harder to interpret in real time as the underlying

30 For more details, see "Guidance on the treatment of COVID-19-Crisis effects on data", Eurostat methodological note, 26 March 2020.

31 In this case, the estimated price change is assumed to be zero over the period of imputation. The guidelines (see footnote 10) allow this procedure in duly justified cases, where it can be expected that the price will be the same when the product becomes available again (museums, for example). However, "carrying forward" in this way has the disadvantage of introducing bias in the index to zero price change.

32 In this context, price index refers to the lowest level in each euro area country of the European Classification of Individual Consumption according to Purpose.

33 Respective metadata for April will be published by Eurostat on 20 May.

34 These data are available in the file published by Eurostat on the methodology page referring to COVID-19.

35 See Chart 7 in the section entitled "Prices and Costs" in this issue of the Economic Bulletin.

consumption patterns are changing and individual price indices may suffer from measurement issues for some time. Against this backdrop, complementing the analysis of the HICP with a more in-depth examination of sub-indices' price-level developments might be prudent. Analysts need to be aware of and track these (temporary) measurement issues.

Articles

1 The transmission of exchange rate changes to euro area inflation

Prepared by Eva Ortega, Chiara Osbat and Ieva Rubene

1 Introduction

Exchange rate changes play an important role in explaining inflation developments. Understanding how exchange rates are passed through to inflation and growth is a crucial part of economic analysis. This article summarises the findings of a research group comprised of experts from the European System of Central Banks (ESCB) who, over the past two years, reviewed and analysed the exchange rate pass-through (ERPT) to inflation in Europe.[36]

This article provides updated empirical estimates of the ERPT to import and consumer prices in the euro area and EU countries. A clear distinction is made between estimates that rely on reduced-form equations, which represent conditional correlations (ERPT), and the pass-through of identified shocks, which are defined as the "price-to-exchange-rate ratio", or the PERR. All of these estimates corroborate the general finding in the literature that the impact of the exchange rate on prices weakens along the pricing chain. The ERPT to consumer prices, obtained from the reduced-form equations, is about one-tenth that of the ERPT to import prices. These estimates are generally found to be stable since the end of the 1990s, but lower than those obtained in the literature for earlier decades. The estimates also suggest that the ERPT in the euro area is stronger for large exchange rate changes compared with small ones.

Structural characteristics, such as trade openness, integration in international production chains, the currency of invoicing of trade and market power, are key in explaining differences in the ERPT across countries and industries. In line with the literature, an analysis using micro and sectoral data, as well as findings based on structural macroeconomic dynamic stochastic general equilibrium (DSGE) models, suggests that increased participation in global value chains, larger market shares, invoicing of euro area imports in euro (local currency pricing) and a large proportion of local distribution costs reduce the ERPT to import prices. In contrast, the ERPT to consumer prices increases when imports account for a greater share of consumption and the domestic distribution sector is more competitive.

[36] A comprehensive report on the findings of the expert group, including a more detailed discussion of the ERPT definition, various determinants and empirical findings, as well as a more comprehensive list of references than that provided in this article, is available in Ortega, E. and Osbat, C. (eds.), "Exchange rate pass-through in the euro area and EU countries", *Occasional Paper Series*, No 241, ECB, Frankfurt am Main, 2020.

In addition to the above-mentioned structural factors, the relative dynamics of prices and the exchange rate depend on the shock to which they react. The distinction between the dependence on the type of shock and structural characteristics is partly a simplification since the two interact: for example, a small, very open country will tend to be more affected by foreign shocks, while a country whose imports are mostly invoiced in euro will tend to experience a lower ERPT. Therefore, the shock-dependency of the ERPT for any country may be intertwined with the other structural characteristics, but the article abstracts from this consideration. Results based on structural models suggest that the response of consumer prices (relative to that of the exchange rate) is somewhat larger when the exchange rate moves because of shocks to monetary policy and to the exchange rate itself, than when the exchange rate moves because of shocks to domestic aggregate supply.

The pass-through of exchange rates to inflation depends on monetary policy. Simulations based on structural models show that the more credible and effective monetary policy is in counteracting inflationary pressures, the lower the reduced-form empirical estimates of the ERPT to import and consumer prices will be. This analysis also shows that when the central bank faces an effective lower bound for monetary policy rates, the ERPT is higher in the presence of interest rate forward guidance and other non-standard measures, such as exchange rate floors.

2 Main empirical facts

2.1 Measuring the impact of the exchange rate on prices

When thinking about exchange rate pass-through, and particularly when comparing estimates from different studies, it is crucial to distinguish between two definitions of ERPT used in the literature. The first definition refers to the estimated size of the response of prices (import or consumer) to changes in the exchange rate in a reduced-form pricing equation. ERPT defined in this way is the estimated coefficient on the exchange rate in a linear regression. The second definition refers to the response of prices relative to that of the exchange rate after any (exogenous) shock that moves the exchange rate. Its estimation requires a structural model with feedback effects, such as structural vector autoregression (SVAR) or DSGE models.[37] The ESCB expert group introduced the term “price-to-exchange-rate ratio” (PERR) for the second concept. The PERR more richly reflects the co-movement of prices and exchange rates, because it captures the various channels of transmission of an underlying economic shock, which are not modelled in single reduced-form equations. This article uses the “ERPT” when referring to the first concept, distinguishing it from the relative response of prices (or real quantities) and exchange rates (PERR) when analysing shock-dependence.

[37] The first notion of ERPT can also be retrieved from the SVAR and DSGE models, but it refers to the exchange rate pass-through parameter in a pricing equation, all else being equal. Hence, it abstracts from all the endogenous responses and feedback effects that are embedded by structural models.

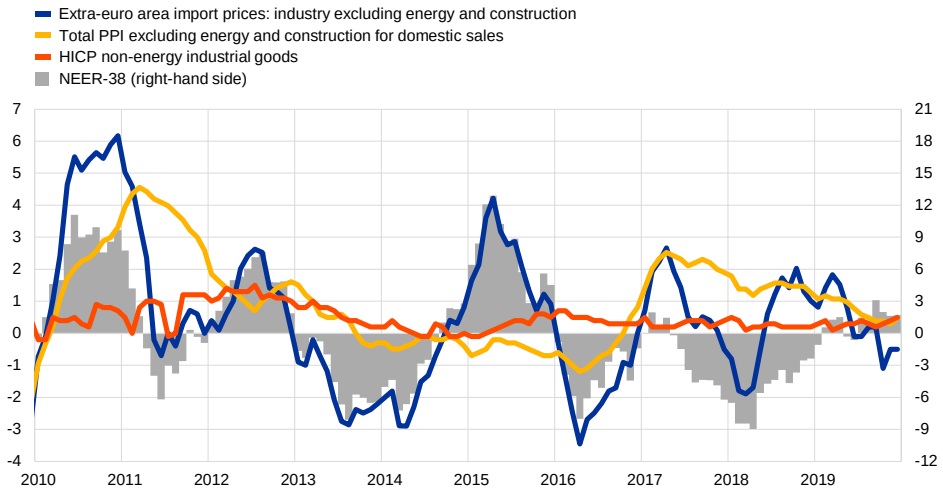
2.2 Estimates for the euro area using various approaches

A robust finding in the empirical literature is that the impact of exchange rates on inflation declines along the pricing chain. It is highest and fastest for import prices at the border, but significantly smaller and slower for final consumer prices, as nominal rigidities and other wedges accumulate across the production process all the way through to the final consumer prices. Generally, a simultaneous co-movement of the nominal effective exchange rate and prices is strong in the case of import prices, much weaker in the case of the producer price index (PPI) and barely noticeable for the consumer prices of non-energy industrial goods (see Chart 1).

Chart 1

Nominal effective exchange rate of the euro, import prices, PPI and consumer prices in the euro area

(year-on-year percentage changes)



Sources: ECB and Eurostat.
Notes: NEER-38 refers to the nominal effective exchange rate against 38 trading partners. The latest observations are for December 2019.

Reduced-form estimates show that the ERPT to consumer prices is about one-tenth of the ERPT to import prices. ERPT estimates found in the literature are often based on different measures of import price or consumer price inflation and alternative measures of exchange rates, and are estimated over different time periods. Using consistent data, the evidence from reduced-form models suggests that a 1% depreciation of the euro raises total import prices in the euro area (including internal euro area trade) and its member countries by, on average, about 0.30% within a year. Over the same period, headline HICP rises by about 0.04%, although the estimates are not always significantly different from zero. These estimates for import and consumer prices are at the low end of the range of those found in the literature.[38] For

[38] See, for example, Hahn, E., "Pass-Through of External Shocks to Euro Area Inflation", *Working Paper Series*, No 243, ECB, Frankfurt am Main, 2003; Hüfner, F. and Schröder, M., "Exchange rate pass-through to consumer prices: a European perspective", *Aussenwirtschaft*, Vol. 58, No 3, 2003, pp. 383-412; Choudhri, E., Faruqee, H. and Hakura, D., "Explaining the exchange rate pass-through in different prices", *Journal of International Economics*, Vol. 65, No 2, 2005, pp. 349-374; Goldberg, L. and Campa, J., "The sensitivity of the CPI to exchange rates: distribution margins, imported inputs, and the trade exposure", *The Review of Economics and Statistics*, Vol. 92, No 2, 2010, pp. 392-407; and Ben Cheikh, N. and Rault, C., "Investigating first-stage exchange rate pass-through: Sectoral and macro evidence from euro area countries", *The World Economy*, Vol. 40, No 12, 2017, pp. 2611-2638.

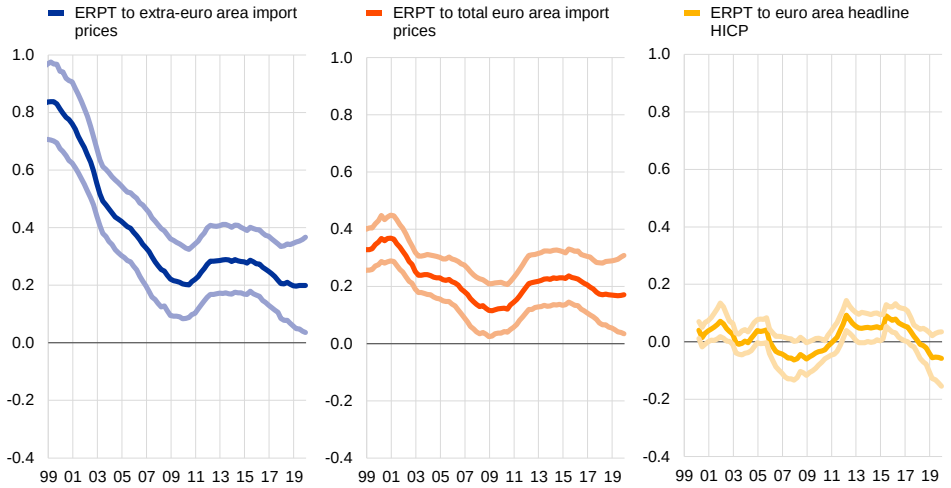
non-euro area EU countries, the median ERPT to consumer prices is of a similar magnitude, while the median ERPT to import prices is somewhat higher (between 0.4% and 0.8%).[39]

The ERPT to import prices of the euro area as a whole declined from the end of the 1990s and has remained broadly stable over the past two decades, whereas the ERPT to consumer prices was very low over the same period. Our estimates are lower than those found in the scarce literature on the ERPT for the euro area that includes earlier decades. Time-varying estimates for the euro area show that the ERPT of the nominal effective exchange rate to extra-euro area import prices declined from around 0.8% in 1999 to around 0.3% in 2008 and remained broadly unchanged thereafter.[40] The ERPT to total import prices was more stable and fell only marginally. The estimate of the ERPT to euro area consumer prices based on this model is not statistically significant for most of the period (see Chart 2).

Chart 2

Time-varying ERPT to euro area import and consumer prices

(percentage impact on prices after four quarters following a 1% depreciation of the euro nominal effective exchange rate)



Source: ECB estimates.
Notes: The time-varying ERPT to import and consumer prices is estimated using single-equation regressions with drifting coefficients and stochastic volatility with data for the period from 1995 (for import prices) and 1997 (for consumer prices) to the fourth quarter of 2019. The lighter lines show the 16th and 84th percentiles of the posterior distribution and the darker line shows the median.

Time-varying estimates for the EU countries show a broadly stable ERPT to import and consumer prices since the end of the 1990s. The ERPT to import prices varies considerably across euro area and EU countries, but is generally higher than for consumer prices for almost all countries. The ERPT to total import prices in

39 The estimates refer to the median estimates across countries for the period from the first quarter of 1999 to the first quarter of 2019; non-euro area EU countries include the Czech Republic, Denmark, Croatia, Hungary, Poland, Sweden and the United Kingdom.

40 This is in line with the fall in the ERPT to import and consumer prices since the 1980s and 1990s that is documented in the literature. For an analysis and an exhaustive literature review see, for example, Campa, J. and Goldberg, L., "Pass-Through of Exchange Rates to Consumption Prices: What has Changed and Why?", in Ito, T. and Rose, A. (eds.), *International Financial Issues in the Pacific Rim: Global Imbalances, Financial Liberalization, and Exchange Rate Policy*, National Bureau of Economic Research, 2008, pp. 139-176.

non-euro area EU countries is considerably higher than in euro area countries, partly reflecting intra-euro area trade being included in the estimates for the latter.[41]

Empirical evidence for a non-linear response of exchange rates in the euro area and its member countries is rather scarce. A number of factors may cause a non-linear response of import or consumer prices to exchange rate changes. Empirical studies suggest that the impact on prices may depend on the direction of change (appreciation or depreciation)[42] or the size of the change. The impact can also change with the state of the economy (for example, at different points in the business cycle and at different levels or variability of inflation).[43] New estimates that look at ERPT non-linearity for the euro area and its member countries find that, after one year, only large changes in the exchange rate have an impact on euro area import prices and headline HICP, which is consistent with, for example, sticky prices due to menu costs.[44] This study also finds that the ERPT to euro area import and consumer prices does not differ between depreciations and appreciations, which is in line with findings for the real exchange rate in the euro area.[45]

The ERPT across countries varies not only at the macro level, but also across sectors. A number of studies have shown that the pass-through to import prices is higher for energy compared with manufacturing products, as exporters appear to price-discriminate to a larger extent between markets for manufacturing goods than between those for commodities.[46] An update of earlier work on the ERPT to import prices in the euro area confirms these findings.[47] More specifically, the ERPT is found to be higher for euro area import prices in energy-related industries compared with manufacturing. Similar findings have also been reported for the ERPT to producer prices. Among the sub-sectors of industry (excluding construction), the ERPT to producer prices is largest in electricity, gas and water supply, as well as in the energy sector, and lowest for capital goods.[48]

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41 Time-varying ERPT estimates for import and consumer prices for individual EU countries are reported in Section 2.2 of Ortega, E. and Osbat, C. (eds.), op. cit.

42 Asymmetric pass-through is documented for a few advanced economies by Delatte, A.-L. and López-Villavicencio, A., "Asymmetric exchange rate pass-through: Evidence from major countries," *Journal of Macroeconomics*, Vol. 34, No 3, 2012, pp. 833-844.

43 For available empirical work related to non-linear ERPT in the euro area, see the references in Section 2.3 of Ortega, E. and Osbat, C. (eds.), op. cit.

44 See Colavecchio, R. and Rubene, I., "Non-linear exchange rate pass-through to euro area inflation: a local projection approach", *Working Paper Series*, No 2362, ECB, Frankfurt am Main, 2020.

45 For findings on the real exchange rate, see Lane, P. R. and Stracca, L., "Can appreciation be expansionary? Evidence from the euro area", *Economic Policy*, Vol. 33, No 94, 2018, pp. 225-264.

46 See, for example, Campa, J. and Goldberg, L., "Pass-Through of Exchange Rates to Consumption Prices: What has Changed and Why?", op. cit.; and Ben Cheikh, N. and Rault, J., op. cit.

47 See Osbat, C., Sun, Y. and Wagner, M., "Sectoral exchange rate pass-through in the euro area", *Working Paper Series*, forthcoming, ECB, Frankfurt am Main, 2020. Their results have a caveat in that the estimates have large confidence bands, but more broadly they are consistent with those in Imbs, J. and Mejean, I., "Elasticity Optimism", *American Economic Journal: Macroeconomics*, Vol. 7, No 3, 2015, pp. 43-83.

48 See Hahn, E., "The impact of exchange rate shocks on sectoral activity and prices in the euro area", *Working Paper Series*, No 796, ECB, Frankfurt am Main, 2007.

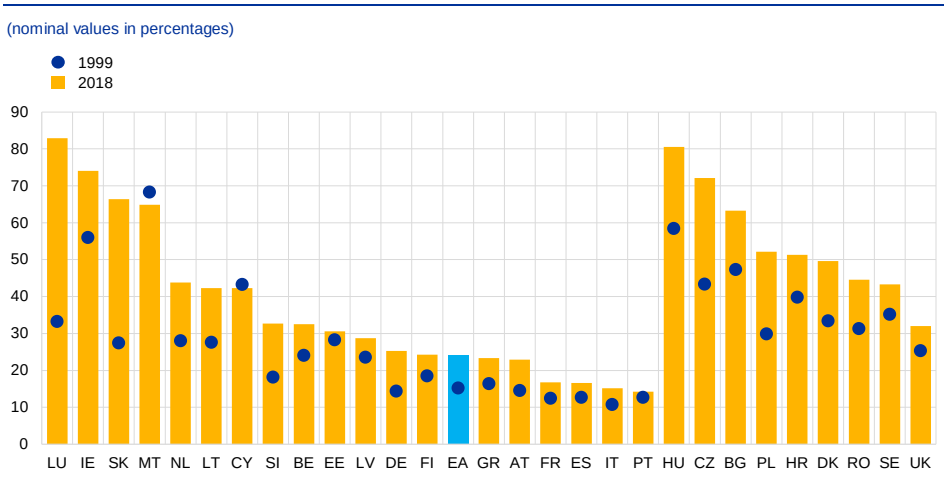
3 Structural characteristics are key to explaining ERPT heterogeneity

The link between the exchange rate and inflation depends on the structural characteristics of industries and countries and how these characteristics evolve over time. Particularly relevant factors are the structure of the economy, the microeconomic structure and behaviour of firms, and the general macroeconomic environment, which are mirrored in the following structural characteristics of countries and sectors: trade openness and import penetration, integration in global value chains, the currency of trade invoicing and the degree of competition and market concentration. It is difficult to disentangle the effects of these factors, as they are intertwined and jointly determine the differences in the ERPT across countries and industries and over time. This section reviews the implications for the ERPT of each of these four structural characteristics separately, but refrains from ranking them by importance.

3.1 Trade openness

The more open a country is to imports, the higher the impact of the exchange rate on import and consumer prices. Trade liberalisation, lower trade costs and technological advances have boosted cross-border trade flows and favoured the organisation of production in cross-border production chains. Openness, as measured by the share of external trade in GDP, varies substantially across the euro area and non-euro area EU economies – with smaller countries generally being more open to trade. Compared with 1999, in most EU countries imports now account for a higher percentage of GDP (see Chart 3).

Chart 3
Imports of goods and services as a share of GDP



Sources: Eurosystem projections database and Eurostat.
Notes: The chart shows extra-euro area imports for euro area countries and total imports for non-euro area EU countries. Data for Malta refer to 2004 and for Estonia and Croatia to 2000, rather than 1999.

The share of imports in private consumption is very important for the ERPT to consumer prices. The import content of private consumption is comprised of two

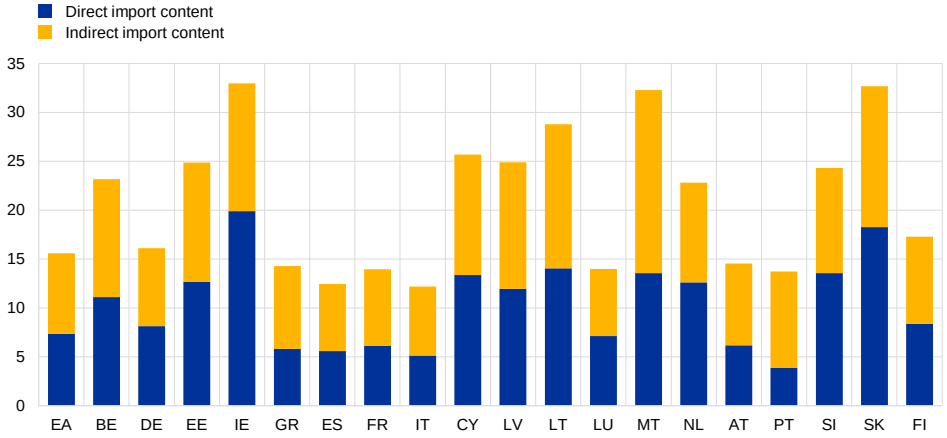
parts. The first measures the share of final consumer products imported from other countries directly (direct import content). The second measures the share of foreign inputs used to produce domestic consumer goods (usually referred to as "indirect import content").

The total (direct and indirect) import content of private consumption in the euro area was around 16% in 2014 and has been trending slightly upwards since 1999.[49] The import content of private consumption varies across countries, but for most countries the direct import share is approximately half of the total import content (see Chart 4). Simulation results from structural DSGE models show that low home bias (i.e. a high import content in consumption) is a key channel for exchange rate changes to have a greater impact on prices, as emphasised in the literature.[50]

Chart 4

Import content of headline HICP in 2014

(percentages of private consumption bundle consistent with headline HICP composition)



Source: ESCB expert group calculations based on methodology described by Schaefer, S. in Box 1 of Ortega, E. and Osbat, C. (eds.), op. cit.

3.2 Integration in global value chains

Another important determinant of the size of the ERPT is the integration in global value chains not only of a country, but also of its trading partners. When countries that export to the euro area source part of their inputs from the euro area itself, a change in the euro exchange rate will have a limited pass-through to euro area import prices because of counterbalancing effects on the input costs side.

Higher participation in global value chains is likely to reduce the ERPT. A structural two-country model with trade in intermediate goods and staggered price-setting shows that the higher the participation of a country's trading partners in

[49] See Schaefer, S., "Import share in the HICP consumption basket", Box 1, Ortega, E. and Osbat, C. (eds.), op. cit.

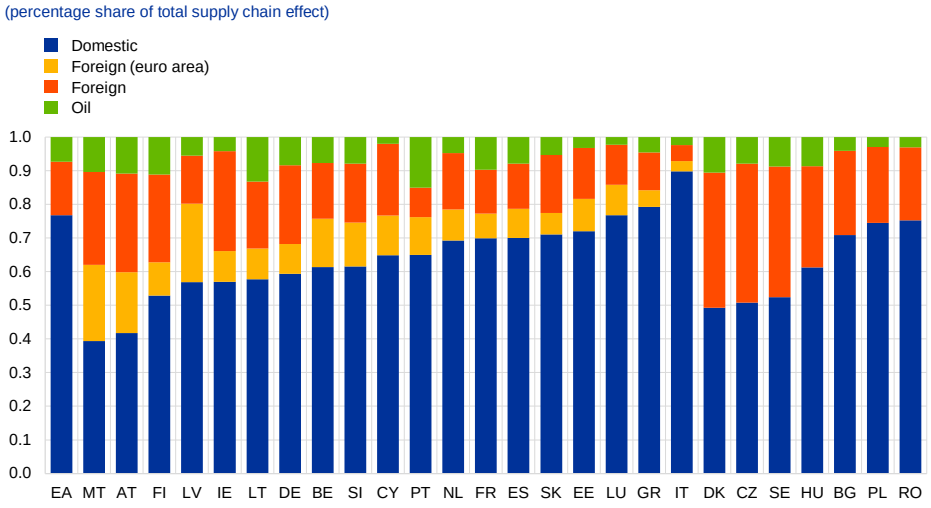
[50] See, for example, De Walque, G. et al., "Low pass-through and high spillovers in NOEM: what does help and what does not", mimeo, *ECB inflation conference,* 2019.

global value chains, the lower the pass-through to its import prices.[51] This finding is confirmed by an industry-level analysis that finds that the higher the use in production of inputs imported from the destination market, the lower the ERPT to import prices.[52]

The degree to which euro area consumer prices depend upon prices of inputs from outside the euro area is rather limited. A recent study finds that supply chain trade, both among domestic sectors and across countries, is an important determinant of consumer prices.[53] The estimated supply chain spillovers to consumer prices can be decomposed according to the country of origin, revealing that the relative weight of foreign input costs for the euro area as a whole is rather small after accounting for the effect of oil prices (see Chart 5). Results for individual countries vary, but reveal relatively strong production linkages within the euro area, which could dampen the exchange rate impact on domestic consumer prices. At the same time, an analysis using a DSGE for the euro area finds that removing the import content of production and exports would more than double the sensitivity of prices to exchange rate changes within the first year.[54]

Chart 5

Relative importance of supply chain spillovers by origin for domestic inflation



Source: ECB calculations using World Input-Output Database (2013 release).
Notes: The decomposition is based on the method presented in Section 4.1.3 of the ECB Working Group on Global Value Chains, op. cit. Data refer to 2008.

3.3 Currency of invoicing

The euro and the US dollar dominate the invoicing of trade in the EU (see Chart 6). Although there is some variation between countries, a large share of extra-EU

[51] See, for example, Georgiadis, G., Gräb, J. and Khalil, M., "Global value chain participation and exchange rate pass-through", *Working Paper Series*, No 2327, ECB, Frankfurt am Main, 2019.

[52] According to De Soyres, F. et al., "Bought, sold, and bought again: the impact of complex value chains on export elasticities", *Policy Research Working Papers*, No WPS8535, World Bank Group, Washington, D.C., 2018, the export price ERPT falls as the level of foreign value-added in exports increases.

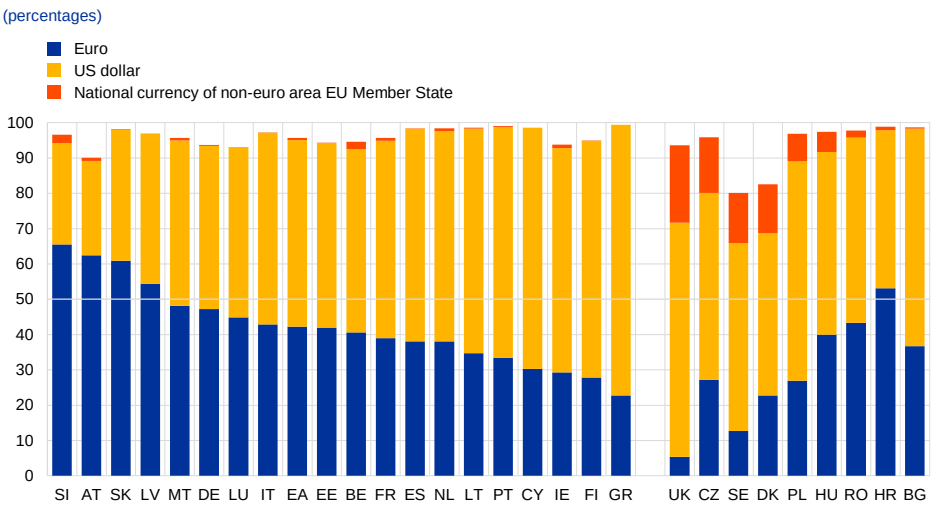
[53] See the ECB Working Group on Global Value Chains, "The impact of global value chains on the euro area economy", *Occasional Paper Series*, No 221, ECB, Frankfurt am Main, 2019.

[54] See De Walque, G. et al., op. cit.

imports for most countries is invoiced in euro. This suggests a limited ERPT to euro area prices, as the share of euro area imports directly exposed to exchange rate fluctuations is small. Moreover, due to both the relatively large size of the euro area compared with other non-euro area EU countries and to the Single Market framework of the European Union, it is likely that trade within the EU is predominantly invoiced in euro.[55]

Chart 6

Invoice currency for imports of goods from countries outside the EU



Source: Eurostat.
Note: Data refer to 2018, except for Estonia and the euro area, where they refer to 2016.

The invoicing decision serves as an active channel through which producers adjust their prices according to their own market power and local competition conditions.[56] If an exporting firm invoices in its own currency, so-called producer currency pricing, its prices will be more sensitive to its own costs and less to the importer's conditions. This will increase the ERPT to the importer's import prices. By contrast, invoicing in the destination's currency, so-called local currency pricing, will reduce the ERPT. Finally, exports invoiced in a third currency, so-called dominant currency pricing, also make prices less sensitive to the bilateral exchange rate and more to the developments of the dominant currency. However, the decision on what currency to invoice in mostly affects ERPT in the near to medium term. In the long run (often not captured by empirical models), producers can change the prices they charge when negotiating a new contract, irrespective of the currency of invoicing.

These conceptual considerations are supported by two new empirical country-specific studies using micro data. One finds a significantly higher pass-through on impact for Danish import prices denominated in other currencies

55 According to Eurostat data, imports in non-euro area EU countries are invoiced mostly in dominant currencies (US dollar and euro). Imports of petroleum goods in most euro area countries are mainly denominated in US dollars. In some countries, the high share of dollar invoicing may also be related to the activity of multinational enterprises (e.g. in Ireland, the Netherlands and Malta).

56 See, for example, Bacchetta, P. and van Wincoop, E., "A theory of the currency denomination of international trade", *Journal of International Economics*, Vol. 67, No 2, 2005, pp. 295-319; and Goldberg, L. and Tille, C., "Micro, macro, and strategic forces in international trade invoicing: Synthesis and novel patterns", *Journal of International Economics*, Vol.102, 2016, pp.173-187.

compared with the pass-through for prices denominated in Danish kroner or euro.[57] Another study uses a firm-level analysis of Italian exports and finds a substantially lower ERPT to Italian export prices with local currency pricing than with dominant currency pricing, whereas the ERPT is highest with producer currency pricing.[58]

Taking into account the share of import invoicing in euro mechanically reduces the impact of exchange rates via the openness channel. Trade openness of the total economy, as measured by extra-euro area imports as a share of GDP and the import content of private consumption, would be reduced by almost half when excluding transactions denominated in euro.[59] For this reason, these measures may overestimate the potential sensitivity of prices to exchange rate movements if the currency of invoicing is not taken into account. An alternative would be to adjust the exchange rate measures, for example by exploring the use of invoicing currency weights as a complement to trade weights when computing nominal effective exchange rates or competitors' export price indices.[60]

3.4 Market power

ERPT decreases as the market share of exporters increases, because firms with greater market power tend to adjust their markups in response to exchange rate changes in order to keep market shares constant. In other words, when competition is low the ERPT can be expected to be low. However, there may be a U-shaped relationship between the ERPT and market power. Under monopolistic competition, the market shares of both very small and very large exporters face little impact if they change their prices, and they would thus pass through most of the exchange rate movement to selling prices. Empirical evidence of this non-linearity is inconclusive, as some studies find that the ERPT decreases monotonically with market share[61], while others confirm the U-shaped relationship.[62] Another possible non-linearity can be related to funding constraints: financially constrained firms may have a higher ERPT, as they find it harder to hedge against exchange rate changes.[63] Large firms, however, may be able to resort to exchange rate hedging via financial instruments, which would further decrease the sensitivity of their prices to exchange rate movements.[64]

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57 See Kristoffersen, M. S., "Invoicing currency and exchange rate pass-through to import prices in Danish firms", Box 4, Ortega, E. and Osbat, C. (eds.), op. cit.

58 See Borin, A. and Mattevi, E., "Invoicing currency, ERPT to export prices and business activity: evidence from an analysis of Italian firms", Box 3, Ortega, E. and Osbat, C. (eds.), op. cit.

59 As reported above, almost half of the euro area's extra-EU trade is denominated in euro.

60 Recent contributions to the literature point in the same direction. See, for example, Chen, N., Chung, W. and Novy, D., "Vehicle Currency Pricing and Exchange Rate Pass-Through", *CESifo Working Paper Series*, No 7695, CESifo Group Munich, 2019.

61 See Amiti, M., Itskhoki, O. and Konings, J., "Importers, Exporters, and Exchange Rate Disconnect", *American Economic Review*, Vol. 104, No 7, 2014, pp.1942-1978.

62 See Devereux, M. B., Dong, W. and Tomlin, B., "Importers and exporters in exchange rate pass-through and currency invoicing", *Journal of International Economics*, Vol.105, 2017, pp. 187-204.

63 See Strasser, G., "Exchange rate pass-through and credit constraints", *Journal of Monetary Economics*, Vol. 60, No 1, 2013, pp. 25-38.

64 See Dekle, R. and Ryoo, H., "Exchange rate fluctuations, financing constraints, hedging, and exports: Evidence from firm level data", *Journal of International Financial Markets, Institutions and Money*, Vol. 17, No 5, 2007, pp. 437-451.

Local distribution margins also matter. When faced with strong competition, local distributors absorb exchange rate fluctuations in their margins, thus reducing pass-through to consumer prices compared with prices at the border. An analysis using daily transaction-level data for package holiday consumer prices in Germany finds that the ERPT is lower for services with higher markups (more productive firms or firms selling higher-quality goods) and also for those with higher distribution costs.[65]

4 ERPT variation: the shocks matter

In addition to the structural determinants discussed above, the impact of exchange rates on inflation also depends on the combination of shocks affecting the economy at each point in time.[66] Seven different DSGE models for the euro area were used to obtain simulations for four types of shocks: an exogenous exchange rate shock, a domestic demand shock, a domestic supply shock and a monetary policy shock. As described in Section 2.1, the PERR is an appropriate measure of the impact of the exchange rate on inflation when analysed through the lens of DSGE models, therefore the results for this measure are discussed below.

The median results across the models show that the relative response of import prices to the exchange rate (the price-to-exchange rate ratio, or PERR) is highest following a monetary policy shock. It is also rather high after an exchange rate shock, but somewhat smaller after demand and supply shocks (see panel (a) in Chart 7). The PERRs for consumer prices are smaller than for import prices after all shocks, albeit the difference declines at longer horizons. The relative importance of shocks is similar (see panel (b) in Chart 7). Overall, the results are rather similar across these models for the exchange rate and monetary policy shocks. Uncertainty is larger for the responses to aggregate demand and supply shocks, as reflected by rather wide interquartile ranges of the outcomes, particularly at longer time horizons.[67]

65 See Nagengast, A., Bursian, D. and Menz, J.-O., "Dynamic pricing and exchange rate pass-through: Evidence from transaction-level data", *Discussion Papers*, No 16/2020, Deutsche Bundesbank, Frankfurt am Main, 2020.

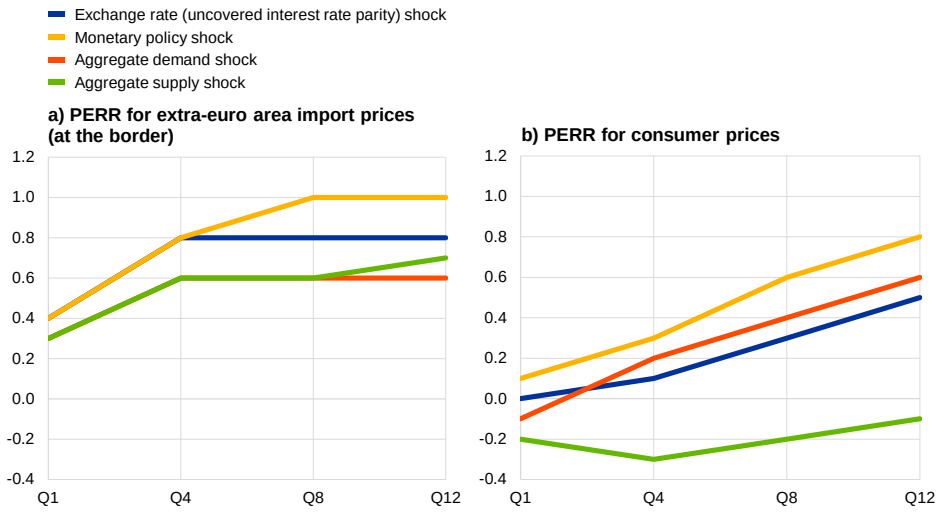
66 See, for example, Corsetti, G. and Dedola, L., "A macroeconomic model of international price discrimination", *Journal of International Economics*, Vol. 67, No 1, 2005, pp. 129-155; and Forbes, K., Hjortsoe, I. and Nenova, T., "The shocks matter: improving our estimates of exchange rate pass-through", *Journal of International Economics*, Vol. 114, 2018, pp. 255-275.

67 For a more detailed comparison and a discussion of PERRs obtained from DSGE and SVAR models, see Section 4 in Ortega, E. and Osbat, C. (eds.), op. cit.

Chart 7

Shock-dependent price-to-exchange-rate ratios for the euro area

(percentage points)



Source: Ortega, E. and Osbat, C. (eds.), op. cit.
Notes: Exchange rate shock is defined as a depreciation of the euro nominal effective exchange rate. The charts report the median estimate for each shock and horizon from the euro area DSGE models developed at the Banca d'Italia, Suomen Pankki – Finlands Bank (included only for consumer prices and excluded from the median for the aggregate supply shock), De Nederlandsche Bank, Deutsche Bundesbank, ECB, Nationale Bank van België/Banque Nationale de Belgique and Banca Națională a României. For more information on the models, see Table 3 in Ortega, E. and Osbat, C. (eds.), op. cit.

Estimates of PERR responses obtained using structural VAR models (SVAR) show similar responses at impact to those obtained using DSGE models, but a somewhat different path thereafter. This reflects the nature of DSGE models as, compared with SVAR models, they more explicitly model structural features of the economy such as price stickiness, import content, effects of the distribution sector and switching from domestic goods to foreign goods in response to price changes. In addition, DSGE models encompass rich feedback interactions within an economy that are captured less explicitly in SVAR models (such as monetary policy responses).

Sensitivity analysis confirms that the structural characteristics of the economy matter for the PERR after an exchange rate shock. Simulations performed using a euro area DSGE model developed in De Walque et al. show that a higher nominal rigidity of import prices visibly lowers the PERR for import prices at the border.[68] This effect disappears after around a year, beyond which prices are allowed to adjust in the baseline specification. Less use of imported intermediate products in domestic production, including for producing exports, in turn increases the consumer price PERR, because a higher share of domestic consumption is subject to expenditure-switching effects and monetary policy reacts more actively. Distribution sector margins were not found to have a significant impact on the results.[69]

Qualitatively, PERR estimates are rather robust across DSGE models for monetary policy and exchange rate shocks, but assessing what exact

68 For further details on the model used, see De Walque, G. et al., "An estimated two-country EA-US model with limited exchange rate pass-through", *NBB Working Papers*, No 317, National Bank of Belgium, 2017.

69 For a more detailed discussion, see Section 4.3.1 in Ortega, E. and Osbat, C. (eds.), op. cit.

combination of shocks determines movements in the exchange rate at any point in time is a much more uncertain task. Recent literature advocates using SVAR models to obtain such exchange rate decompositions.[70] The results from four alternative SVAR models for the euro area reveal that the outcomes are relatively similar in terms of the response of prices to a given type of shock, but rather different across the models in terms of the historical contributions of each shock to exchange rate changes through time.[71] This large uncertainty about the exact shock decomposition at a given point in time cautions against relying on one specific model when evaluating which shocks drive exchange rate changes.

Although this article mainly focuses on analysing the impact of the exchange rate on prices, the model-based analysis used naturally also provides information on the impact of exchange rates on growth. In parallel with the PERR, the growth-to-exchange-rate ratio estimates obtained from DSGE models show that real GDP growth in the euro area increases following exchange rate depreciations that are due to monetary policy shocks. However, the uncertainty surrounding the estimates is somewhat larger for growth than for prices. Box 1 provides a brief overview of the main findings regarding the impact on growth of exchange rates and their sensitivity to some structural characteristics.

Box 1

The impact of exchange rates on real GDP growth

Prepared by Jaime Martínez-Martín

This box examines the link between the exchange rate and real GDP growth over time, which is closely related to analysing the impact on inflation of the exchange rate. Indirect transmission channels through the real economy are important, because exchange rate movements affect not only prices but also economic activity, which, in turn, might trigger price changes.

The exercise is conducted through the simulation of multiple models: DSGE open-economy models and structural VAR models for the euro area.[72] The models entail different specifications and values

70 See, for example, Forbes, K. et al., "The shocks matter: improving our estimates of exchange rate pass-through", *Journal of International Economics*, Vol. 114, 2018, pp. 255-275.

71 The four SVAR models used were from: i) Comunale, M. and Kunovac, D., "Exchange rate pass-through in the euro area", *Working Paper Series*, No 2003, ECB, Frankfurt am Main, 2017; ii) an updated version of Conti, A. et al., "Low inflation and monetary policy in the euro area", *Working Paper Series*, No 2005, ECB, Frankfurt am Main, 2017; iii) a model for the euro area using an identification presented in Forbes, K. et al., op. cit.; and iv) Leiva-Leon, D. et al., "Exchange rate shocks and inflation comovement in the euro area", *Working Paper Series*, No 2383, ECB, Frankfurt am Main, 2020. Model comparison shows that when an ex ante specific monetary policy shock can be identified, such as the announcement of the asset purchase programme by the ECB in 2014, then the models broadly agree on which main shocks drive the exchange rate. See, for example, Section 5 in Ortega, E. and Osbat, C. (eds.), op. cit.; and Comunale, M., "Shock dependence of exchange rate pass-through: a comparative analysis of BVARs and DSGEs", *Working Paper Series*, No 75/2020, Bank of Lithuania, 2020.

72 All DSGE models are based on a new Keynesian framework, i.e. on nominal (price and/or wage) rigidities. Monetary policy, modelled by a systematic feedback (Taylor) rule on the short-term policy rate, has a non-trivial stabilisation role.

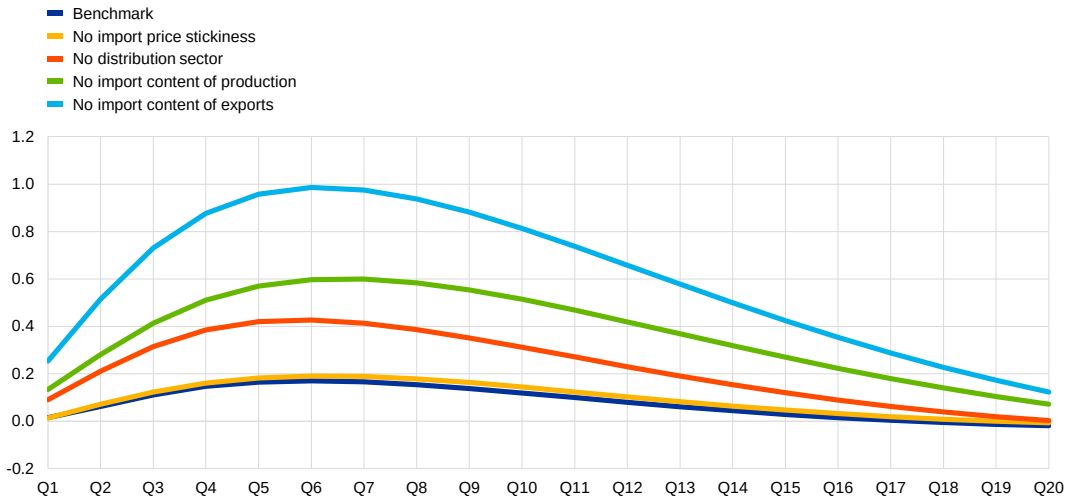
of parameters, therefore the comparison across models allows more robust results concerning the exchange rate effects to be obtained.[73]

The exchange rate is an endogenous variable, whose contribution to growth can vary over time and depend on the type of shock that is moving it. Following the approach in the literature, it is possible to derive a time-varying and shock-dependent measure of the relative response of growth and of the exchange rate itself conditional on shocks to domestic monetary policy, the exchange rate, domestic aggregate demand and domestic aggregate supply.[74] Analogous to the PERR, one can define a "growth-to-exchange-rate ratio". Chart A shows the simulations for this growth-to-exchange-rate ratio following an exchange rate shock (i.e. an uncovered interest rate parity shock, or UIP), derived from a DSGE model for the euro area developed by De Walque and co-authors.[75]

Chart A

Growth-to-exchange-rate ratios and sensitivity analysis for the exchange rate (UIP) shock

(percentage points)



Source: ESCB expert group calculations based on the model by De Walque, G. et al., op. cit.
Note: An increase in the nominal exchange rate corresponds to a euro depreciation in nominal terms. GDP growth is measured in real terms. The simulation shows the percentage point impact after a +1% UIP shock, which follows an autoregressive process of order one with persistence set to 0.9.

The growth-to-exchange-rate ratios corresponding to the benchmark case suggest that GDP increases only slightly (see Chart A). The transmission mechanism proceeds as follows: given the exchange rate depreciation, import prices increase at the border and euro area households replace US dollar-denominated bonds with euro-denominated ones due to higher returns.[76] At the same time, export prices (expressed in the currency of the destination market) fall and the implied expenditure-switching effect favours euro area exports and reduces euro area imports. Overall,

[73] For a review of the literature related to the exchange rate impact on growth, see Eichengreen, B., "The real exchange rate and economic growth", *Commission on Growth and Development Working Paper,* No 4, World Bank, Washington, D.C., 2008. For a more recent approach, see Habib, M. M. et al., "The real exchange rate and economic growth: Revisiting the case using external instruments", *Journal of International Money and Finance*, Vol. 73, 2017, pp. 386-398.

[74] This approach was first proposed in Shambaugh, J., "A new look at pass-through", *Journal of International Money and Finance*, Vol. 27, No 4, 2008, pp. 560-294, and popularised by Forbes and co-authors, for example in Forbes, K. et al., op. cit.

[75] For a description of the model, see De Walque, G. et al., op. cit.

[76] The aggregate import price adjusts only gradually to changes in the exchange rate because of the time-dependent Calvo signal received by individual firms (firms adjust short-run markups). Import prices at the consumer level adjust to a lower extent than at the border, because prices of the distribution services change at a more gradual pace.

consumer prices increase following the increase in euro area import prices. The central bank raises the monetary policy rate to counterbalance higher inflation pressures. The higher monetary policy rate and risk premium induce households and firms to reduce consumption and investment in the euro area. Thus, GDP increases only slightly due to higher net exports.

The sensitivity analysis for the UIP shock gives an indication of the respective role of the different structured factors examined: (i) wholesale (border) import prices are fully flexible; (ii) there is no distribution sector; (iii) there are no foreign intermediate inputs in domestic production; and (iv) exports do not have import content.[77] The results show that, first, in the absence of import price nominal rigidities, the implied import price response at the border is nearly twice as large on impact but returns to the benchmark after one year. Second, in the absence of distribution sector margins, the expenditure-switching effect induced by the devaluation is stronger, such that net trade and GDP improve compared with the benchmark. Third, once foreign intermediate inputs are removed from the list of production factors, the calibration of the share of imported consumption goods is doubled in order to keep the import-to-GDP ratio unchanged across different simulations. The greater weight of imported goods in the consumption basket magnifies the effect of the exchange rate on consumer price dynamics, monetary policy and GDP growth accordingly. Finally, when both foreign intermediate inputs and the import content of exports are set to zero, and the calibrated share of imports in the consumption basket is increased to match the import-to-GDP ratio, the GDP response becomes about four times larger than in the benchmark for the first year.

The estimates of the effect of the exchange rate changes on GDP growth reveal a rather high disagreement across the models. The growth-to-exchange-rate ratio estimates obtained from seven euro area DSGE models suggest that real GDP growth in the euro area rapidly increases in the short term following exchange rate depreciations that are due to monetary policy and domestic supply shocks (see Table A). However, depreciations due to exogenous exchange rate shocks explain a very small percentage of the change in GDP growth. The results obtained from four SVAR models, in turn, show sizeable effects across models for exogenous exchange rate shocks and domestic demand shocks. Overall, the impact of exchange rate shocks on GDP growth is less evident than it is on prices. After general equilibrium effects and time series dynamics are taken into account, the uncertainty surrounding the estimates is larger for growth than for prices.[78]

[77] For a more detailed explanation of how the transmission mechanism works when passing from one assumption to the other, see De Walque, G. et al., op. cit.

[78] For details on inflation, see Comunale, M., op. cit.

Table A

Empirical estimates for shock-dependent real GDP to exchange rate ratios in the euro area

Shock	Horizon	Median DSGE	Median SVAR	Shock	Horizon	Median DSGE	Median SVAR
Exogenous exchange rate	Q1	0.03	0.33	**Monetary policy**	Q1	0.27	0.03
	Q4	0.03	0.25		Q4	0.65	0.05
	Q8	0.02	0.25		Q8	0.53	0.05
	Q12	-0.09	0.24		Q12	0.35	0.04
Domestic demand	Q1	-0.84	0.10	**Domestic supply**	Q1	0.99	-0.01
	Q4	0.89	0.11		Q4	0.85	0.00
	Q8	0.62	0.08		Q8	1.17	-0.03
	Q12	0.36	0.04		Q12	-0.50	-0.05

Source: ESCB expert group on exchange rate calculations.
Notes: The table reports the median estimate for each shock and horizon from the euro area DSGE models developed at the Banca d'Italia, Suomen Pankki – Finlands Bank (excluded from the median for the domestic supply shock), De Nederlandsche Bank, Deutsche Bundesbank, ECB, Nationale Bank van België/Banque Nationale de Belgique and Banca Națională a României. For more information on the models, see Table 3 in Ortega, E. and Osbat, C. (eds.), op. cit. The median responses for SVAR models are calculated from the four SVAR models referred to in footnote 36.

5 Conclusions

The impact of exchange rate changes on inflation depends on the shocks and on the reaction of monetary policy. Finding a small unconditional impact empirically does not therefore mean that the exchange rate has no impact on inflation. When considering the shock-dependence of the ERPT, it is important to distinguish between the ERPT estimate in a pricing equation and the relative response of prices and exchange rates to a structural shock. In fact, the more credibly and effectively monetary policy counteracts external inflationary pressures, the lower ex post statistical estimates of the ERPT will be when estimated using reduced-form equations, whereas estimates from structural models are less affected. The exchange rate channel is important for domestic inflation shocks as well. An interest rate hike after an inflationary domestic demand shock would imply an exchange rate appreciation and hence a fall in import prices, which would counterbalance the initial domestic inflation pressures.[79]

For the euro area, the exchange rate serves as a crucial transmission channel not only for conventional, but also for unconventional monetary policy.[80] Model simulations show that, under the effective lower bound and with credible forward guidance of continued unchanged interest rates, the relative response of inflation and exchange rates will be higher than without forward guidance. This finding is robust across the seven euro area DSGE models that underlie the results reported in this article (see the notes for Chart 7). These results suggest that the monetary policy

[79] Agents expect interest rate changes that will move the exchange rate so that import prices will return back to their steady state values. Hence, these shocks will have a relatively low impact on import price inflation if the policy is expected to react aggressively. For further discussion, see, for example, Carriere-Swallow, Y. et al., "Monetary Policy Credibility and Exchange Rate Pass-Through", *IMF Working Paper*, No 16/240, Washington, D.C., 2016. In the context of Phillips curve analysis, a similar argument was recently also made in McLeay, M. and Tenreyro, S., "Optimal Inflation and the Identification of the Phillips Curve", *NBER Macroeconomics Annual*, Vol. 34, 2019.

[80] For a more detailed review of the effects of unconventional monetary policy measures in the euro area on the ERPT, and in particular of the effect of interest rates forward guidance, see Section 6 in Ortega, E. and Osbat, C. (eds.) op. cit.

stance is very relevant for the overall interaction of exchange rates with prices throughout the pricing chain.

Non-standard monetary policy tools other than forward guidance also have an impact on the ERPT. Structural model-based analysis shows that the announcement of the asset purchase programmes, such as the asset purchase programme announced in 2015 by the ECB, led to a situation where the extent of depreciation and the intensity of price responses depended on the structural characteristics of each economy.[81] Other non-standard measures, such as the introduction of an exchange rate floor (as in the Czech Republic in November 2013), also had an impact on the ERPT – the effects on inflation were stronger and longer-lasting than in normal times.[82]

In order to evaluate the impact of exchange rate changes on consumer prices, it is important to use models that capture structural characteristics of the economy. This encompasses tracing the effect of exchange rates depending on the nature of the underlying shocks and accounting for the monetary policy response to these shocks.

81 See, for example, Bokan, N. et al., "EAGLE-FLI: A macroeconomic model of banking and financial interdependence in the euro area", *Working Paper Series*, No 1923, ECB, Frankfurt am Main, 2016; and Coenen, G. et al., "The New Area-Wide Model II: an extended version of the ECB's micro-founded model for forecasting and policy analysis with a financial sector", *Working Paper Series*, No 2200, ECB, Frankfurt am Main, 2018 (rev. 2019).

82 For an assessment of the introduction of the exchange floor, see Brůha, J. and Tonner, J., "An Exchange Rate Floor as an Instrument of Monetary Policy: An Ex-post Assessment of the Czech Experience", *Working Paper Series*, No 4, Czech National Bank, 2017.

2 Negative rates and the transmission of monetary policy

Prepared by Miguel Boucinha and Lorenzo Burlon[83]

1 Introduction

As structural and cyclical factors have brought nominal interest rates closer to zero, the need to ease financing conditions further has prompted the adoption of a negative interest rate policy (NIRP). The introduction of negative policy rates has been part of a comprehensive policy strategy adopted by the ECB since mid-2014 in order to stave off the unprecedented disinflationary forces that arose in the aftermath of the global and sovereign debt crises. The ECB has cut its deposit facility rate (DFR) into negative territory five times since 2014. The latest lowering of the DFR in September 2019 and the associated market expectations of a longer period of negative rates have reignited the question of how negative rates are transmitted to the economy, especially through banks, and whether they may have counter-productive effects by impinging on banks' intermediation capacity.

Negative rates are transmitted via different channels. Negative rates soften the expectation of markets that current and future short-term rates cannot be negative. By lowering the perceived lower bound of central bank rates, negative rates allow the monetary accommodation to propagate through the entire yield curve. Moreover, investor demand for longer-dated assets increases more than when rates are positive, exerting further downward pressure on the term premium, i.e. the compensation that investors demand for the uncertainty regarding the future path of interest rates. Finally, commercial banks are incentivised to expand lending so as to avoid the negative rate applied to their excess holdings of reserves with the central bank (excess liquidity) in a situation in which the cost of liabilities is partially constrained.

The transmission of NIRP via banks could in principle be hindered by potential large-scale shifts into cash and downward pressure on bank profitability. The transmission of monetary policy could be diluted if investors hoard cash rather than rebalancing their portfolios towards longer-term or riskier assets. So far there are no signs of large-scale liquidity "leakages" of this type, mainly owing to the costs of forgoing the services provided by central bank reserves or commercial bank deposits as a means of conducting payments and storing value. This is partly due to the limited transmission of negative deposit rates to retail deposits, especially of households, which can, however, dent bank profitability and ultimately hamper their ability to provide lending to the real economy. Potential factors that may hinder the transmission of monetary policy in the event of any further extension of the policy or deeper cuts into negative rate territory must therefore be monitored closely.

Overall, negative interest rates have supported economic activity and ultimately contributed to price stability. As a result of NIRP, lending volumes have

[83] Data support provided by Maria Dimou and Michele Federle. The authors gratefully acknowledge input from Giacomo Carboni, Matteo Falagiarda, Florian Heider and Glenn Schepens, as well as comments and suggestions from Ugo Albertazzi and Csaba Móré.

expanded and the creditworthiness of borrowers has improved, thereby mitigating the impact of lower interest margins on overall bank profitability. While NIRP, and more generally the low level of interest rates, may contribute to the build-up of debt and spur over-pricing of financial assets or exuberance in housing markets, when such phenomena are identified they are generally best addressed by targeted macroprudential policies. Meanwhile, the first-order and tangible effect of NIRP on financial stability has been that it has enhanced it by improving the sustainability of outstanding debt.

This article is organised as follows. Section 2 explains how negative rates are transmitted via banks and financial markets. Box 1 illustrates the transmission of NIRP to financial market prices. Section 3 then turns to the impact of negative rates on bank profitability and risk-taking. Box 2 describes the transmission of negative rates in money markets. Section 4 reports empirical evidence on how negative rates affect the broader economy. Section 5 concludes.

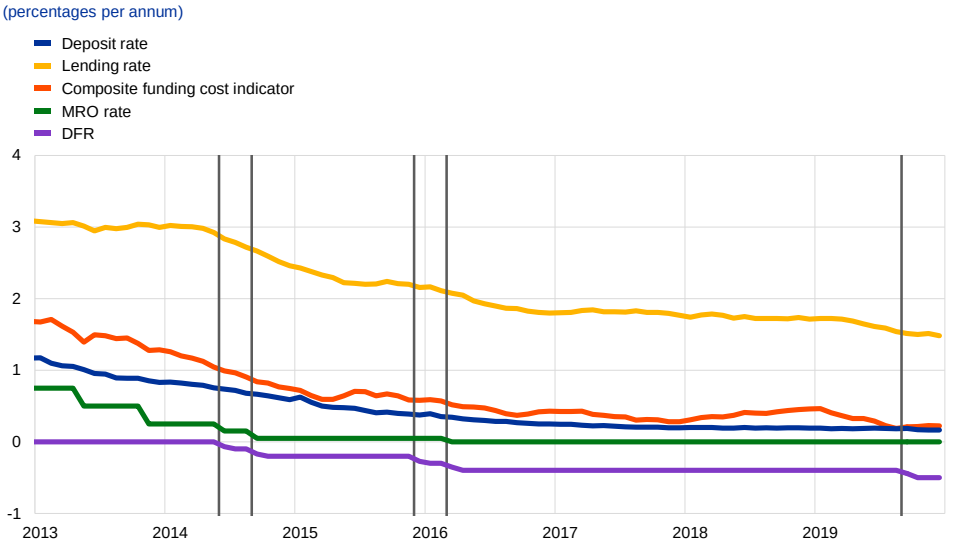
2 The transmission of negative interest rates

In June 2014 the ECB introduced NIRP as part of a broad credit easing package, leading to lower bank deposit and lending rates. NIRP shares some of the basic easing features of a standard interest rate cut, as is evident in the reaction of bank funding and lending rates to the original cut in the DFR into negative territory as well as to the subsequent reductions (see Chart 1). However, when rates are below zero, additional channels are activated. Some enhance the stimulus provided by the cut, while others can dampen transmission via banks.

NIRP reduces bank funding costs, stimulating loan supply. Composite funding costs for euro area banks have been compressed since 2014, helping to maintain intermediation margins for banks with an average funding structure. Moreover, there is evidence that, as negative rates persist, even banks that rely predominantly on deposit funding eventually pass the interest rate reduction on to at least part of their deposit base, namely corporate deposits and large retail deposits. However, some degree of downward rigidity in retail deposit rates remains, limiting the scope for further improvements in funding costs without changes to the funding structure.

Chart 1

Developments in policy rates, bank funding costs and bank lending rates



Sources: ECB and ECB calculations.
Notes: The vertical black lines indicate the five cuts in the DFR into negative territory, from 0 to -0.1% in June 2014, from -0.1% to -0.2% in September 2014, from -0.2% to -0.3% in December 2015, from -0.3% to -0.4% in March 2016, and from -0.4% to -0.5% in September 2019. Latest observation: December 2019.

Moreover, there are additional channels that strengthen the transmission of negative rates compared to a standard rate cut, especially when the latter occurs close to the perceived "lower bound".[84]

First, negative interest rates remove the non-negativity restriction on current and future expected short-term rates and, therefore, monetary accommodation can propagate throughout the yield curve. Before June 2014 the distribution of future expected short-term rates was effectively truncated at zero, as market participants were not assigning significant probability to future rates being negative. The introduction of negative policy rates allowed the constellation of rates to expand into negative territory. As the expansion of the interest rate distribution on the negative side affects not only current rates but also expected future rates, the stimulus also propagates to longer maturities (see Box 1).

Second, NIRP increases investor demand for longer-dated assets, exerting further downward pressure on the term premium. The negative remuneration of excess liquidity and its transmission to short-term interest rates create incentives for investors to rebalance their portfolios towards assets with longer maturities, increasing the demand for these securities relative to their supply. While this compression in yields of longer-dated assets also occurs following policy rate cuts in positive territory, it becomes more prominent when rates are below zero, as some investors are particularly averse to accepting negative nominal returns, for instance because they

84 A comprehensive discussion on the role and effectiveness of non-standard measures, including NIRP, and the various channels through which they are transmitted to financial conditions and ultimately affect the real economy can be found in Rostagno, M., Altavilla, C., Carboni, C., Lemke, W., Motto, R., Saint-Guilhem, A. and Yiangou, J., "A tale of two decades: the ECB's monetary policy at 20", *Working Paper Series*, No 2346, ECB, December 2019.

are committed to providing positive nominal returns to their final beneficiaries. This ultimately exerts extra downward pressure on the term premium.

Third, commercial banks are encouraged to expand lending to avoid negative interest on their holdings of excess liquidity. Banks face a direct charge on their excess liquidity, which exerts pressure on their profitability, particularly as the remuneration of their liabilities is, in part, bounded at zero. They can avoid this charge by rebalancing their portfolios in favour of credit expansion or by purchasing securities.[85] In fact, returns on all liquid assets in banks' portfolios drop relative to loans, providing them with a strong incentive to rebalance in favour of credit origination.[86]

At the same time, negative rates also entail frictions that may hinder the transmission of monetary policy via banks. Banknotes yield a zero nominal return, so, if deposits carry negative nominal interest rates, depositors may at some point resort to cash hoarding as a way to avoid them. This implies that retail deposit rates, which are quite responsive downwards when policy rates adjust in positive territory, become much stickier. As the returns on the assets held by banks are not subject to the same downward stickiness, this results in a compression of banks' interest margins, which applies pressure on bank profitability. Moreover, banks tend to hold assets with relatively long durations, which reprice more slowly than their liabilities, so protracted periods of negative rates may dent banks' net worth and thereby impair the bank-based transmission mechanism of monetary policy. Moreover, the pressure to maintain intermediation margins and to move away from less risky liquid assets provides banks with an incentive to increase their risk tolerance, which may eventually lead to excessive risk-taking.[87]

More generally, investors (banks and non-banks) might hoard cash rather than rebalance their portfolios towards longer-term or riskier assets, although there are no strong signals of such a "leakage". To the extent that cash and deposits are perfect substitutes, agents would respond to negative interest rates on deposits by holding cash, implying an effective lower bound of zero for interest rates. However, in practice they are not perfect substitutes. In fact, deposits have several advantages, such as being a more efficient means of storing value and conducting payments. This convenience has an intrinsic monetary value. So far, there is no evidence of large-scale shifts into cash among depositors such as households, corporates or non-bank financial institutions (see Chart 2, panel a). Banks themselves may, in principle, also use their holdings of excess reserves with the central bank to acquire

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85 The banking system as a whole cannot reduce excess liquidity by expanding credit or acquiring securities, as such transactions merely shift liquidity from one bank to another within the closed system in which it can circulate. Nevertheless, individual banks can engineer a reduction in their own excess liquidity position in this way.

86 See Demiralp, S., Eisenschmidt, J. and Vlassopoulos, T., "Negative interest rates, excess liquidity and retail deposits: banks' reaction to unconventional monetary policy in the euro area", *Working Paper Series*, No 2283, ECB, May 2019; and Bottero, M., Minoiu, C., Peydró, J.-L., Polo, A., Presbitero, A.F. and Sette, E., "Negative Monetary Policy Rates and Portfolio Rebalancing: Evidence from Credit Register Data", *IMF Working Papers*, No 19/44, February 2019.

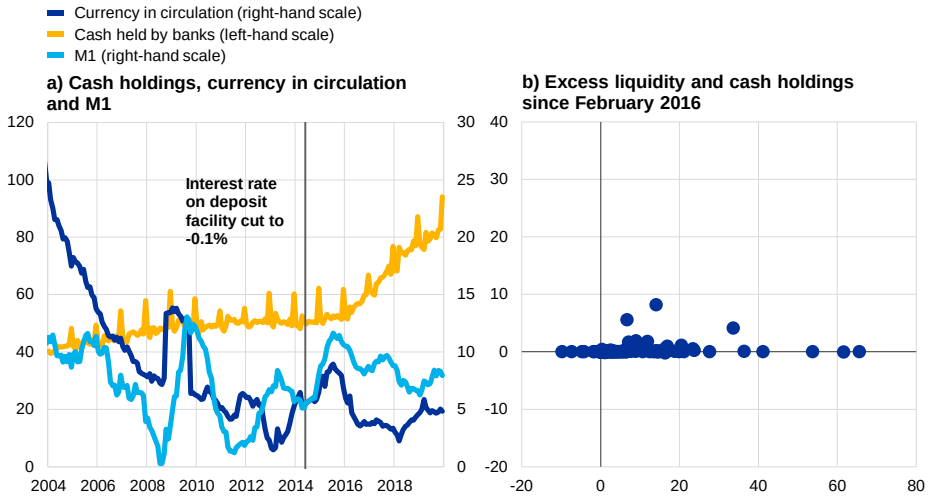
87 More generally, there may also be incentives for non-banks to embark on excessive risk-taking. For example, several investment and pension funds are committed to paying out at least the nominal amount of initial contributions. NIRP reduces the return that can be obtained for a certain level of risk, forcing these intermediaries either to accept lower profitability or to invest in riskier assets in search of higher returns.

and hold banknotes as a way to eschew the negative rate on those reserves. While an increase in banks' holdings of banknotes has indeed been observed, this has not occurred to an extent that would provide strong signals of a leakage of liquidity away from the banking sector and into cash, as there is very little correlation between excess liquidity and actual vault cash (see Chart 2, panel b).

Chart 2

Currency in circulation and holdings of cash and excess liquidity by euro area banks

(panel a: left-hand scale: non-seasonally adjusted stocks, EUR billions; right-hand scale: annual rate of growth, percentages; panel b: x-axis: changes in excess reserves, EUR billions; y-axis: changes in vault cash, EUR billions)



Sources: ECB and ECB calculations.
Notes: The vertical line in panel a indicates the introduction of the negative deposit rate in June 2014. Figures for currency in circulation refer to the year-on-year growth rate. For M1, the annual growth rate is shown. In panel b, changes between February 2016 and December 2019 are computed using annual averages. Latest observation: December 2019.

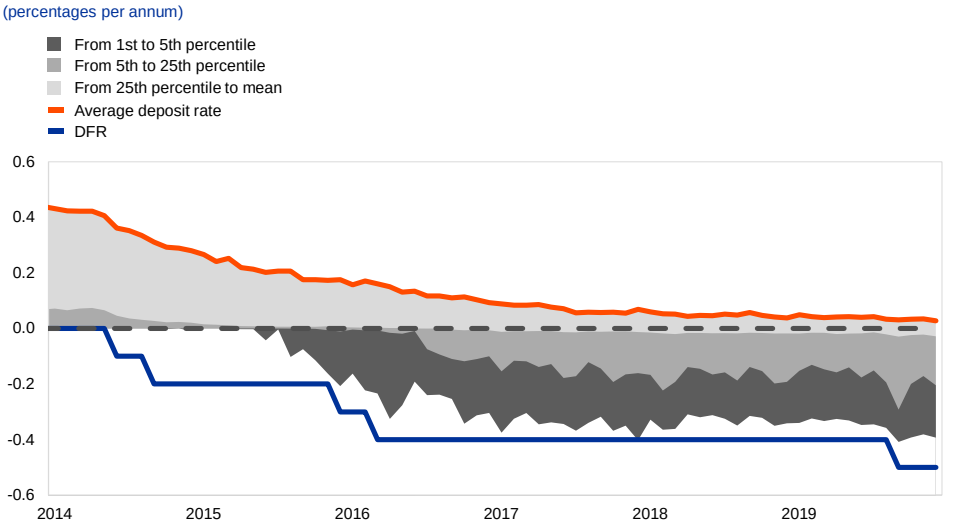
Retail deposits tend not to carry negative rates, either because of legislative hurdles and litigation risks or concerns about deposit withdrawals. Legislators and courts have so far maintained a legal framework that poses a series of legal constraints and litigation risks related to the application of negative deposit rates. These vary from country to country and according to the sector of the depositor and are also dependent on whether they would apply to new or existing contracts. However, in the majority of euro area countries, the transmission of negative rates to corporate deposits is not subject to legal constraints and is indeed a relatively widespread phenomenon which has been increasing over time (see Chart 3).[88] Moreover, fees and commissions can lead to an effective negative nominal return on deposits, even if they do not carry a negative interest rate. Nonetheless, there is no evidence that, as the remuneration of retail deposits passed the zero line, banks experienced significant outflows of deposits. This suggests that, until it reaches a level that exceeds the cost of hoarding cash, a negative nominal rate would only generate a change in behaviour among retail depositors as a result of some form of money illusion or other behavioural bias.[89]

88 Altavilla, C., Burlon, L., Giannetti, M. and Holton, S., "Is there a zero lower bound? The effects of negative policy rates on banks and firms", *Working Paper Series*, No 2289, ECB, June 2019.

89 For example, although for rational agents the reference rate should be the real rate, there is some uncertainty around its level, as it depends on inflation expectations. However, a negative nominal rate is not only more transparent but also a certain loss.

Chart 3

Evolution of deposit rates for non-financial corporations



Sources: ECB and ECB calculations.
Notes: The red line is a composite indicator of the average deposit rate on new deposits. The composite indicator is computed by taking the weighted average of deposit rates on new overnight and agreed maturity deposits, where the weights are outstanding amounts of these two categories. Rates on new deposits with agreed maturity are a weighted average of rates on new deposits for each maturity (below 1 year, between 1 and 2 years, above 2 years), where the weights are the 24-month moving averages of the new business volumes. Shaded areas refer to different quantiles of the distribution of deposit rates. The solid blue line is the DFR and the dashed black line indicates zero. Latest observation: December 2019.

Other instruments in the current policy toolbox, in particular asset purchases, forward guidance, targeted longer-term refinancing operations (TLTROs) and the two-tier system for reserve remuneration, complement and reinforce the transmission of NIRP. Asset purchases increase the volume of excess liquidity in the banking system, strengthening the pressure on individual banks to shift their excess liquidity to other banks by acquiring assets. Forward guidance reduces uncertainty about the future path of interest rates. TLTROs ensure that banks can obtain funding at very low interest rates (as low as the DFR) and help to channel the resulting reduction in funding costs towards new lending to firms and households (other than for house purchases). The two-tier system for reserve remuneration allows the accommodative effects of NIRP to be maintained while mitigating the downward pressure on bank profitability stemming from the negative remuneration of excess liquidity holdings.

Box 1

The transmission of negative policy rates to the yield curve and other asset prices

Prepared by Giacomo Carboni, Wolfgang Lemke and Daniel Kapp

Concomitant with the overall decline in the DFR of 50 basis points between June 2014 and the end of 2019, sovereign bond and swap rates across maturities decreased significantly, while corporate bond yields declined and equity prices rose. Specifically, the short end of the yield curve traced the 50 basis point reduction in the DFR almost one for one, with the one-week overnight index swap (OIS) rate decreasing by close to 60 basis points between 4 June 2014 and the end of 2019.[90] Ten-year OIS

[90] The reaction of the short-term swap rate is slightly stronger than the move in the policy rate because the gap between the EONIA and the DFR was somewhat larger in mid-2014 than it is now.

rates, a key benchmark for long-term risk-free rates in the euro area, declined by around 130 basis points over the same period, i.e. exceeding the decline at the short end of the curve. Investment grade corporate bond yields of non-financial corporations (NFCs) decreased by roughly 120 basis points, while euro area equity prices increased by close to 25%.

Bond yields across maturities have been influenced by a host of other factors besides changes in current and expected ECB policy rates. For instance, long-term rates also incorporate risk premia, which in turn depend on a number of factors, such as other policy measures (including asset purchases) and global risk factors.[91] In order to estimate the yield curve impact stemming purely from negative interest rate policy (NIRP), a counterfactual "no-NIRP" scenario has been constructed in which both current and expected future short-term rates are prevented from going below zero. Specifically, at any horizon, the option-implied risk-neutral density of future short-term rates is cut at zero from below and the probability mass that markets assigned to sub-zero rates is re-attributed to the zero lower bound. Such counterfactual rate distributions can be skewed to the upside, inducing a tightening bias in the corresponding forward curve. The difference between forward rates in such a hypothetical non-negative-rate scenario and observed rates is taken as the impact of negative policy rates. A Bayesian vector autoregression (BVAR) model has been used to translate the derived impact on the forward curve into the full yield curve impact.[92]

NIRP is estimated to have compressed two-year and ten-year sovereign bond yields by around 40 basis points and 35 basis points, respectively, by the end of 2019 (see Chart A). In contrast to estimates of standard policy rate cuts in positive territory, the impact on longer maturities is comparably large relative to the impact on the short end of the curve. This pattern is also visible when looking at changes in the yield curve in response to surprise policy rate cuts (shocks) averaged over several events; while the impact of a standard rate cut diminishes relatively quickly across maturities, it is more pronounced for rate cuts to negative levels.[93]

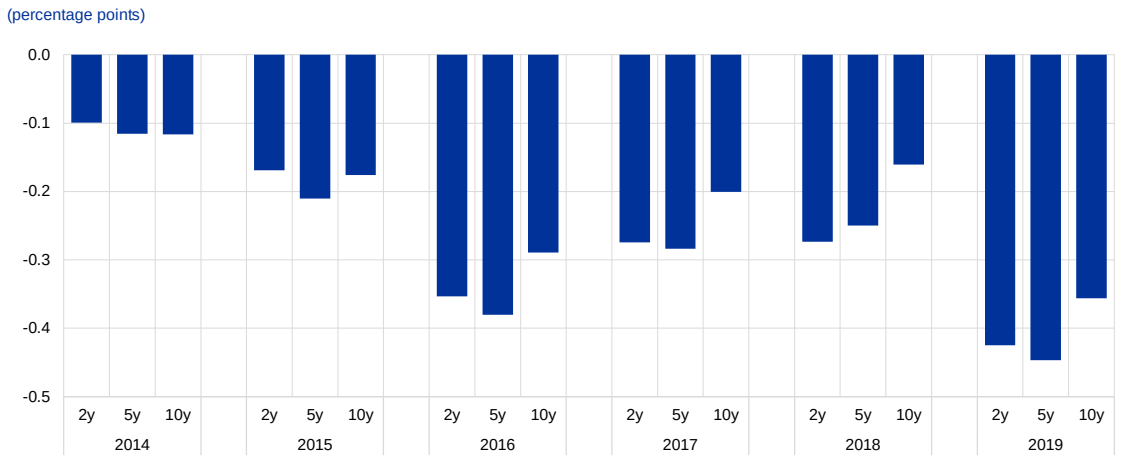
91 For a review of the influence by policy and non-policy factors on the euro area yield curve, see, for example, Lane, P.R., "The yield curve and monetary policy", public lecture for the Centre for Finance and the Department of Economics at University College London, London, 25 November 2019. For an assessment of the impact of the asset purchase programme (APP) on euro area term premia, see, for example, the article entitled "Taking stock of the Eurosystem's asset purchase programme after the end of net asset purchases", *Economic Bulletin*, Issue 2, ECB, 2019.

92 For details of this approach, see Rostagno, M. et al., op. cit.

93 See, for example, Chart 6 in Lane, P.R., "The monetary policy toolbox: evidence from the euro area", keynote speech at the 2020 US Monetary Policy Forum, 21 February 2020.

Chart A

Estimated impact of negative interest rate policy on the sovereign yield curve



Source: Updated figures for Rostagno, M. et al. op. cit.
Note: The chart illustrates the impact of NIRP on sovereign yields (weighted average of German, French, Italian and Spanish sovereign bond yields), which works primarily via the short-term rate and the OIS forward curve.

One of the reasons for the different "footprints" of policy innovations is that yield-seeking investors may be more strongly incentivised to climb up the maturity ladder if shorter-term assets are pushed into more negative yields. Rate cuts to below zero and the ensuing ECB communications have typically been understood by investors as indicating an extended scope for rate cuts in the future. Market participants' perceived distribution of future policy rates thus extends further into negative territory, which decreases rate expectations and thereby compresses long-term rates.[94]

The NIRP-induced decrease in risk-free rates had a direct effect on risky asset prices, leading – all else being equal – to increases in stock prices and decreases in corporate and sovereign bond yields. Employing a dividend discount model to dissect the drivers of stock price changes between early June 2014 and the end of 2019 suggests that roughly half of the total increase in stock prices was due to decreases in the risk-free component of the discount rate (see Chart B).[95] The impact of NIRP – identified via the yield curve analysis described above – is estimated to account for somewhat more than one-fifth of this, i.e. contributing around 3 percentage points to the overall stock price increase. This figure is probably a lower bound for the overall contribution of NIRP to stock price changes, as the stimulating effect of this policy measure on the economy (see Section 4) is likely to have raised earnings expectations and might have decreased the equity risk premium via confidence effects. At the same time, in the period from June 2014 to the end of 2019, the equity risk premium increased overall, constituting a drag on equity prices. Thus, even if NIRP itself has had a positive effect on equity premia, equity valuations relative to those of risk-free rates do not appear to be more stretched compared to their pre-NIRP levels.

94 See Lane, P.R., "The yield curve and monetary policy", op. cit., and the references given therein.

95 For more details, see the article entitled "Measuring and interpreting the cost of equity in the euro area", *Economic Bulletin*, Issue 4, ECB, 2018.

Chart B

Decomposition of the change in euro area equity prices from June 2014 to the end of 2019

(percentages, cumulative changes since June 2014)

Sources: Bloomberg, Thomson Reuters, IBES, Consensus Economics and ECB calculations.
Notes: The decomposition is based on a dividend discount model. The model includes share buy-backs, discounts future cash flows with interest rates of appropriate maturity, and includes five expected dividend growth horizons. Each slice of the bar denotes the contribution of the respective factor to the overall change in stock prices. Due to approximation errors, the changes displayed in the chart do not precisely add up to the total change in euro area equity prices over the period. For more details, see *Economic Bulletin*, Issue 4, ECB, 2018. Latest observation: December 2019.

Similarly, all else being equal, NIRP induced a decrease in the risk-free component of corporate and sovereign bond yields. In addition, an improved macroeconomic outlook and risk perceptions may have compressed yields further via lowered spreads and risk premia.

Overall, alongside other monetary policy measures, negative rates have contributed to alleviating the cost of market-based financing in the euro area since mid-2014. Importantly, they have helped lower risk-free rates across the maturity spectrum, thereby facilitating a pass-through to a wide spectrum of corporate and household financing, ranging from corporate bank loan rates (being typically of shorter maturity) to mortgage lending rates and corporate bond yields (traditionally issued at longer maturity and duration).

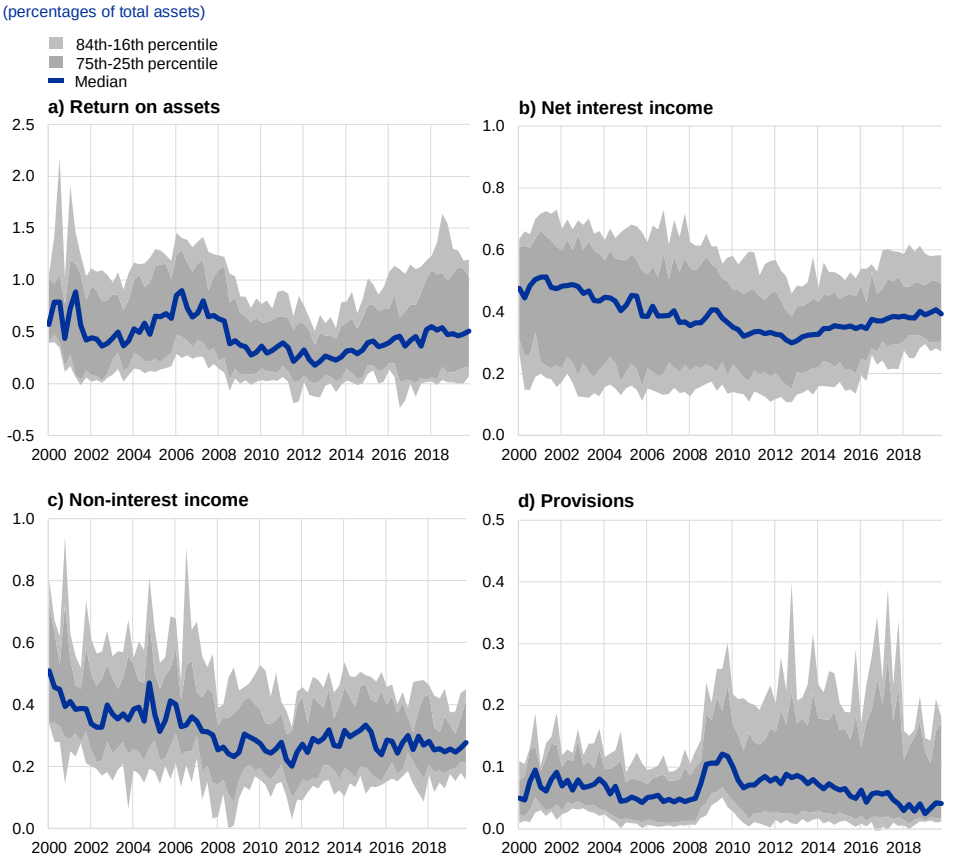
3 Impact on bank profitability and risk-taking

Euro area bank profitability has gradually recovered from the significant decline that followed the crisis, but remains low by historical standards (see Chart 4). Bank profitability showed an upward trend in the run-up to the financial crisis, followed by a decline, which was largely driven by a sharp increase in loan loss provisions. Since 2012, bank profitability has gradually recovered, as loan loss provisions have decreased and net interest income has remained broadly stable. Nevertheless, the return on equity stood at around 6% in the third quarter of 2019, which is below most estimates of the cost of equity – for example, the majority of banks participating in the European Banking Authority's Risk Assessment

Questionnaire report an estimated cost of equity of between 8% and 10%.[96] Beyond the cyclical environment, structural challenges afflicting the euro area banking sector played a significant role in depressing the overall level of bank profitability.[97] Low profits limit the scope for organic recapitalisation of banks through retained earnings, which is necessary to build and retain the capacity to intermediate and provide credit to firms and households. At the same time, market valuations of bank equities are low, also compared to non-financial or other financial firms. This, in turn, can inhibit banks from tapping markets to raise capital, as doing so when valuations are low would heavily dilute the holdings of current shareholders.

Chart 4

Evolution of profitability and its main components



Sources: Bankscope, SNL, Bloomberg and Capital IQ.
Notes: The chart illustrates developments over time in the main components of bank profitability as a percentage of total assets (y-axes) and their cross-sectional dispersion for a sample of 288 banks. The solid blue line represents the median for the cross-section of banks for each quarter. Similarly, the shaded areas indicate the interquartile range (dark grey) and the standard deviation (light grey) of the cross-sectional distribution of banks. Latest observation: December 2019.

Negative interest rates have both adverse and beneficial effects on bank profitability, and the net effect is ultimately an empirical question. In addition to the constraints on lowering retail deposit rates below zero, NIRP leads to a more

96 See "Risk Assessment Questionnaire – Summary of the Results", European Banking Authority, Autumn 2019.

97 These include poor cost-efficiency, overcapacity, strong competition and insufficient income diversification. See, for example, Andersson, M., Kok, C., Mirza, H., Móré, C. and Mosthaf, J., "How can euro area banks reach sustainable profitability in the future?", *Financial Stability Review*, ECB, November 2018.

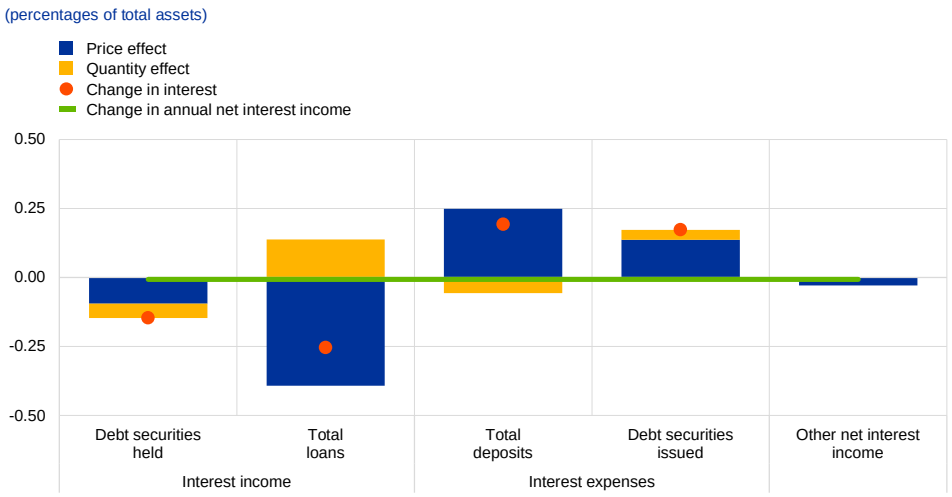
significant reduction in rates at the longer end of the term structure than a conventional policy rate cut (see Box 1). Since banks typically engage in maturity transformation, obtaining funding at shorter maturities and durations than those at which they lend, this contributes to an additional squeeze on net interest margins compared to a rate cut in a positive interest rate environment. However, there are also channels through which NIRP supports bank profits, in particular through its impact on asset valuations and, more importantly, on the macroeconomy.[98] The positive impact of the policy on macroeconomic conditions leads to higher intermediation volumes, supporting net interest income. Moreover, the improved economic outlook and the lower level of interest rates boost borrower creditworthiness, reducing costs stemming from loan loss provisions. At the same time, decreases in yields driven by NIRP are reflected in an increase in the value of the securities held by banks, thereby leading to (temporary) capital gains for banks.

The main component of bank profitability, net interest income, has so far remained rather resilient, as larger intermediation volumes have offset the lower margins. Chart 5 shows that the decrease in income on loans and securities has been offset by lower interest expenses on deposits and debt securities issued, based on actual developments in interest rates and volumes. In the chart, these movements are represented by the red circles. The developments are further decomposed into price and quantity effects (yellow and blue bars). These show that the negative impact of lower interest rates on the income from loans has been partly offset by higher intermediation volumes. The negative quantity effect on debt securities reflects banks' portfolio rebalancing towards loans. Analogously, on the liability side, the liquidity injected by the APP led to an increase in deposits by the money holding sector, thereby increasing the relevance of this funding source for banks. At the same time, lower interest rates on deposits and debt securities issued supported net interest income.

[98] Altavilla, C., Boucinha, M. and Peydró, J.-L., "Monetary policy and bank profitability in a low interest rate environment", *Economic Policy*, Volume 33, Issue 96, 2018, pp. 531-586.

Chart 5

Changes in net interest income between 2014 and the third quarter of 2019



Sources: ECB and ECB calculations.
Notes: The sample is balanced (covering 194 euro area banks) and adjusted for major mergers and acquisitions. Interest expenses are inverted, so decreases in costs are shown as positive contributions to profits.

To comprehensively assess the impact of NIRP on bank profitability, it is crucial to look at components beyond net interest income and to take into account the impact of the policy on the broader economy. As discussed above, one would expect, all else being equal, that lower and, in particular, negative interest rates would lead to a decline in banks' net interest margins, and indeed several empirical studies highlight this relationship.[99] However, the overall impact on bank profitability depends not only on developments in net interest margins but also on the macroeconomic outlook, which affects credit demand and borrower creditworthiness and therefore intermediation volumes and loan loss provisions. Therefore, a comprehensive assessment of the impact of low or negative interest rates on bank profitability requires consideration not only of developments in interest rates but also of the impact of monetary policy on economic activity.

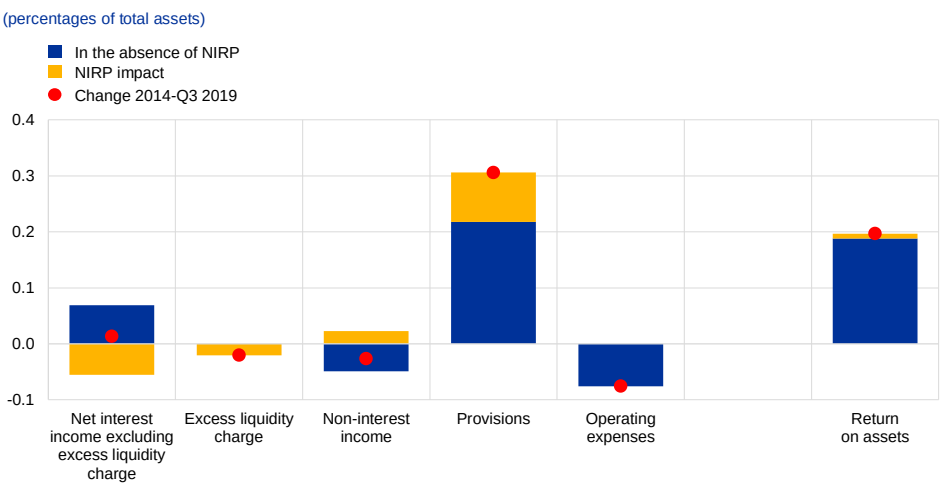
Negative interest rates have had a broadly neutral impact on bank profitability so far, as their negative effect on net interest income has been offset by a positive effect on borrower creditworthiness. Chart 6 reports the results of a comprehensive assessment of the impact of NIRP on bank profitability. The exercise was conducted by comparing actual developments in the main components of bank profitability in the period during which NIRP has been in place with those under a counterfactual scenario in which NIRP was not implemented. This scenario is obtained from the simulation of a BVAR model under the assumption that the zero lower bound would be enforced at all times, thereby preventing the term structure of interest rates

99 See, for example, Alessandri, P. and Nelson, B.D., "Simple Banking: Profitability and the Yield Curve", *Journal of Money, Credit and Banking*, Vol. 47(1), 2015, pp. 143-175; and Borio C., Gambacorta, L. and Hofmann, B., "The influence of monetary policy on bank profitability", *International Finance*, Vol. 20(1), 2017, pp. 48-63.

from assuming negative values across all maturities.[100] Under this scenario, higher interest rates would have been reflected in weaker loan growth and lower borrower creditworthiness and therefore in higher loan loss provisions. Actual developments in bank profitability components (red circles) can therefore be decomposed into a part that represents the estimated impact of NIRP (yellow bars) and one which would have been observed under the counterfactual scenario (blue bars). In line with the frictions highlighted above, the estimated impact of NIRP on net interest income is negative.[101] The direct cost of remunerating banks' holdings of excess liquidity at the negative DFR is shown as a separate component and, overall, is limited. The chart also illustrates the positive impact of negative interest rates on non-interest income. This effect is relatively small and short-lived, as it mainly reflects the impact of decreases in interest rates on the value of the securities held by banks. More importantly, NIRP is estimated to have accounted for a significant share of the observed decline in loan loss provisions. Overall, taking all effects into account, NIRP is estimated to have had a negligible impact on bank profitability up to now.

Chart 6

Changes in bank profitability between 2014 and the third quarter of 2019 and NIRP impact



Sources: ECB and ECB calculations.
Notes: The sample is balanced (covering 194 euro area banks) and adjusted for major mergers and acquisitions. The NIRP impact is obtained using a dynamic BVAR model.

While some banks are more exposed to the low interest rate environment, so far there is no evidence of an overall negative impact of NIRP on bank profits across bank business models. This conclusion is based on an assessment of the impact of NIRP on bank profitability across bank business models using a dynamic

[100] The model includes information on return on assets, net interest income, non-interest income, loan loss provisions, lending rates to NFCs, loan volumes to NFCs, real GDP, HICP inflation and interest rates with a remaining maturity of one day, five years and ten years over the period from the first quarter of 1999 to the second quarter of 2019. For technical details of the model, see Altavilla, C. et al., "Monetary policy and bank profitability in a low interest rate environment", op. cit. As in Rostagno, M. et al., op. cit., the analysis is based on a conditional forecast for a counterfactual scenario with no NIRP under the assumption that the zero lower bound would be enforced at all times, thereby preventing the term structure from assuming negative values across all maturities.

[101] The blue bar is positive for net interest income, implying that the offsetting factors have up to now been more significant than expected. This could be due to a shift in banks' funding structure towards cheaper funding sources or to a portfolio rebalancing towards riskier, and therefore higher-yielding, assets.

macroeconomic model similar to that described above. The results indicate that, while NIRP has a more negative impact on the net interest margins of retail banks – those relying more on retail deposits – the same banks also benefit more from the improved credit quality and intermediation volumes that are linked to the positive impact of monetary accommodation on the macroeconomic outlook.

Looking ahead, the balance between costs and benefits may evolve if interest rates remain low for a long period of time. The detrimental impact on net interest margins is likely to be more significant as rates remain low for longer.[102] This is because banks are still benefiting from income on fixed-rate loans originated when interest rates were higher, and this income will progressively decrease as legacy loans mature.[103] Moreover, the scope for further savings in provisions and funding costs is limited, in particular for banks whose loan portfolio is concentrated on low-risk borrowers. The cost for banks of holding excess reserves also increased following the cut in the DFR in September 2019 and the increase in excess liquidity driven by the reactivation of the APP, but these effects are mitigated by the introduction of the two-tier system for the remuneration of excess reserves (see also Box 2).

While the compression of intermediation margins can lead to an increase in the riskiness of bank portfolios, so far there is limited evidence that such an increase has been excessive. Banks may be more willing to raise the risk profile of their investments in the aftermath of NIRP in a search for higher yields.[104] Whether this riskiness can be deemed excessive depends on whether it is adequately priced in in the terms and conditions of new loans and, even more importantly, on whether it is factored in in credit standards. Evidence from the euro area bank lending survey (BLS) shows that the easing of margins on riskier loans has been much more contained than that on average loans, and, over the last year, margins on riskier loans have actually been tightening.[105] Moreover, model-based evidence suggests that the increase in the risk profile of portfolios has been adequately reflected in lending rates, although some sectors, like consumer lending, have started to show signs of exuberance.[106] Regulatory pressures and supervisory oversight have played, and continue to play, a crucial role in fostering a balanced coexistence between negative rates and prudent loan pricing practices.[107]

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102 See, for example, Altavilla, C. et al., "Monetary policy and bank profitability in a low interest rate environment", op. cit.; and Claessens, S., Coleman, N. and Donnelly, M., "'Low-For-Long' interest rates and banks' interest margins and profitability: Cross-country evidence", *Journal of Financial Intermediation*, Vol. 35, Part A, 2018, pp. 1-16.

103 Chart 1 illustrates the declining trend in loan-to-deposit margins for new loans. Analogously, by granting loans or investing in securities with fixed rates and long maturities in the current environment, banks are locking in low income streams for a long period of time, which could adversely affect their profitability in the future.

104 See Heider, F., Saidi, F. and Schepens, G., "Life below zero: Bank lending under negative policy rates", *The Review of Financial Studies*, Vol. 32(10), 2019.

105 See Burlon, L., Dimou, M., Drahonsky, A. and Köhler-Ulbrich, P., "What does the bank lending survey tell us about credit conditions for euro area firms?", *Economic Bulletin*, Issue 8, ECB, 2019.

106 See Albertazzi U., Altavilla C. and Boucinha M., "Assessing the excessiveness of banks' risk-taking", in Albertazzi, U., Barbiero, F., Marques-Ibanez, D., Popov, A., Rodriguez D'Acri, C. and Vlassopoulos, T., "Monetary policy and bank stability: the analytical toolbox reviewed", *Working Paper Series*, No 2377, ECB, February 2020.

107 See Altavilla, C., Boucinha, M., Peydró, J.-L. and Smets, F., "Banking supervision, monetary policy and risk-taking: big data evidence from 15 credit registers", *Working Paper Series*, No 2349, ECB, January 2020.

While the broader low interest rate environment can pose financial stability risks, targeted macroprudential action is best placed to address specific fragilities. Excessive debt, overpricing of certain financial assets or exuberance in some local housing markets can be supported by the broader low interest rate environment and may threaten financial stability. For example, the January 2020 BLS has highlighted that, even amid growing concerns about the macroeconomic outlook that have curtailed borrowing by firms, net demand for housing loans is continuing to increase at above the historical average rate.[108] While the overall rate of growth of housing loans in the euro area is not very high compared to past episodes, in some countries it may pose financial stability concerns, as it may generate bubbles in local house prices that may warrant targeted macroprudential action by national authorities.[109] Indeed, the European Systemic Risk Board (ESRB) has recently issued a series of warnings and recommendations on vulnerabilities in the residential real estate sector.[110] Moreover, macroprudential authorities in different jurisdictions have activated a series of measures in the real estate domain, regarding the maturity and loan-to-value ratio of loans and the debt service-to-income ratio of borrowers.

Box 2

The transmission of negative interest rates in euro area money markets

Prepared by Nick Ligthart and Julian Schumacher

Short-term interest rates in euro area money markets play a crucial role in the monetary policy transmission process, by serving as the main reference points for banks when pricing loans to firms and households. Effective monetary policy transmission therefore requires changes in the ECB's key interest rates to be closely followed by developments in money market rates. Ultimately, the market rates that matter most for the pricing of bank loans vary with unsecured overnight rates, such as the euro overnight index average (EONIA) or the euro short-term rate (€STR).[111]

The supply of central bank reserves available in the banking system determines which of the ECB's key interest rates anchors short-term rates (see Chart A). This relationship also holds in a negative interest rate environment. If the central bank provides sufficient reserves to just match the demand in the banking system arising from reserve requirements and autonomous factors, market participants tend to price the cost of overnight funding close to the interest rate on the MRO.[112] In an environment of excess liquidity, however, overnight rates are grounded by the DFR. When the ECB began its negative interest rate policy by reducing the DFR to below zero in June 2014, excess liquidity was already elevated compared with pre-crisis levels, at around €200 billion. Consequently, short-term rates hovered between the DFR and the MRO rate. The injection of substantial amounts of excess

108 See "The euro area bank lending survey – Fourth quarter of 2019", ECB, January 2020.

109 See Burlon, L., Gerali, A., Notarpietro, A. and Pisani, M., "Non-standard monetary policy, asset prices and macroprudential policy in a monetary union", *Journal of International Money and Finance*, Vol. 88, 2018, pp. 25-53.

110 See "ESRB issues five warnings and six recommendations on medium-term residential real estate sector vulnerabilities", press release, ESRB, 23 September 2019.

111 The euro interbank offered rate (EURIBOR) and interest rate swap rates are the most commonly used reference rates in the euro area for pricing bank loans to NFCs and households. These reference rates depend on expectations regarding unsecured overnight rates, such as the EONIA or the €STR, and therefore, ultimately, vary with such rates.

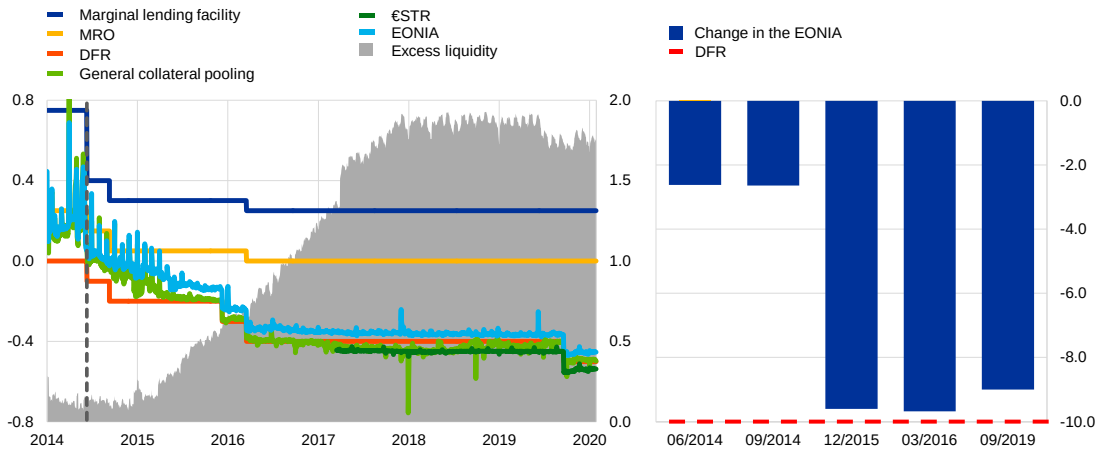
112 See, among others, Poole, W. (1968), "Commercial bank reserve management in a stochastic model: implications for monetary policy", Journal of Finance, 23, 769-791.; Whitesell, W. (2006), "Interest rate corridors and reserves," Journal of Monetary Economics, 53(6), 1177–1195; and Bindseil, U. (2014), "Monetary Policy Operations and the Financial System", Oxford University Press.

liquidity from the asset purchase programme pushed interest rates more decisively towards the DFR, most notably since the start of the public sector purchase programme (PSPP) in March 2015.

Chart A

Short-term money market rates and excess liquidity

(left panel: left-hand scale: percentages; right-hand scale: EUR trillions; right panel: basis points)



Sources: ECB and Bloomberg.
Notes: The right panel shows the change in the EONIA on the first day after each rate cut relative to the average EONIA in the five business days before each rate cut. The pre-€STR is used before October 2019. In the left panel, the vertical broken line indicates the introduction of the negative DFR. In the right panel, the horizontal broken line indicates the size of each of the cuts in the DFR (10 basis points). Latest observations: 27 January 2020.

The ECB's negative interest rate policy has been smoothly transmitted to short-term rates (see Chart A). The EONIA – historically the interbank lending rate for overnight funds in the euro area – is currently hovering around -0.45%, roughly 50 basis points below its level in June 2014.[113] It has thus fully traced the overall reduction in the DFR since the start of the negative interest rate policy. The delay in the pass-through of the initial DFR cuts below zero in June and September 2014 probably reflected operational adjustment costs of market participants in the new negative interest rate environment, as well as frictions in the distribution of excess liquidity across the euro area.[114] In contrast, subsequent reductions in the DFR, which have taken place in an environment of high excess liquidity, have been followed promptly by short-term money market rates.

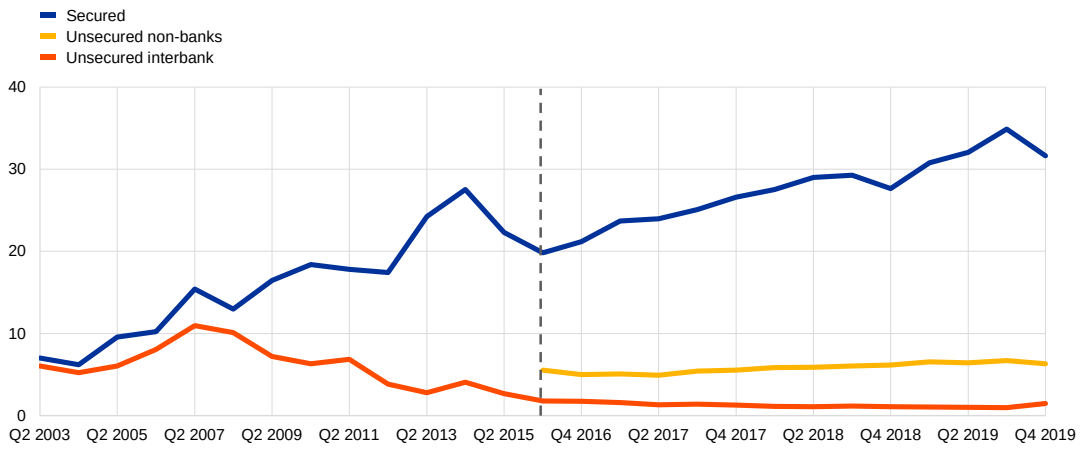
[113] The EONIA was traditionally calculated as a weighted average of the interest rates on overnight unsecured lending between banks. However, this calculation method does not comply with the EU Benchmarks Regulation (Regulation (EU) 2016/1011) and cannot be used for new contracts after 1 January 2020. Therefore, since 2 October 2019, the EONIA has been determined as the €STR plus a fixed spread of 8.5 basis points.

[114] See Demiralp, S. et al., op. cit.

Chart B

Turnover in selected money market segments

(EUR trillions)



Sources: ECB Euro Money Market Survey (until Q2 2015) and money market statistical reporting (MMSR) (as of Q3 2016).
Note: The vertical broken line indicates when the collection of MMSR data started (Q3 2016). Latest observations: Q4 2019.

The excess liquidity generated by the ECB's non-standard measures has reduced demand from banks for short-term liquidity in money markets, which in turn has led to some money market benchmark rates falling below the DFR. This reflects the fact that euro area banks have the outside option of placing their excess liquidity in the deposit facility instead of lending it in the market (see Chart B).[115] As a result, unsecured interbank rates (such as, historically, the EONIA) are based on increasingly low trading volumes, but have remained above the DFR. At the same time, the APP has also placed large amounts of liquidity in the hands of non-banks and banks located outside the euro area, which do not have access to the ECB's deposit facility. These market participants need to resort to euro area money markets for liquidity storage purposes. Important benchmark rates reflecting such a broader spectrum of market participants – such as the €STR – are therefore largely dominated by the deposit-taking of euro area banks. These benchmark rates have declined to below the DFR, as banks with abundant reserves charge a spread to accept additional deposits. For similar reasons, certain repurchase agreement (repo) rates are also hovering below the DFR. While general collateral repo rates reflecting cash funding costs have remained relatively tightly linked to the level of the DFR, repo rates for specific collateral have occasionally dropped significantly lower, reflecting market participants' search for specific bonds.[116]

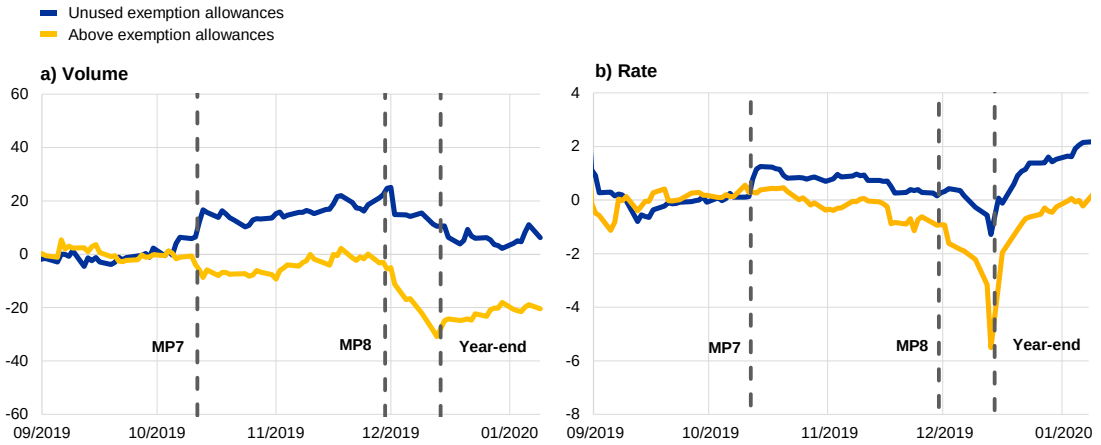
[115] The drop in demand has been driven by post-crisis regulations, which have increased the regulatory cost of unsecured trading activity, possibly exacerbated by residual market fragmentation along national borders.

[116] Repo trades can be cash-driven (initiated to borrow cash in exchange for collateral) or security-driven (initiated to temporarily "borrow" specific securities that are offered as collateral in exchange for lending cash). As market participants search for specific collateral, some issuer-specific and even broad general collateral baskets have traded below the DFR. In a reaction to these developments, the Eurosystem enhanced its securities lending facility by accepting cash collateral from December 2016, mitigating some of the pressure on euro area repo markets.

Chart C

Reaction of banks' secured borrowing volumes and rates to the introduction of the two-tier system for excess reserve remuneration

(left panel: percentages; right panel: basis points)



Source: ECB.
Notes: MP7 and MP8 stand for the seventh and eighth reserve maintenance periods of 2019. The chart plots the stock of outstanding secured borrowing volumes and the volume-weighted average borrowing rate of those MMSR reporting agents which trade on a regular basis in the secured market, distinguishing between reporting agents with less excess liquidity holdings during the sixth reserve maintenance period (MP6) than their exemption allowance (i.e. six times their minimum reserve requirement) (blue line) and reporting agents with more excess liquidity holdings than their exemption allowance (yellow line). For each of the two groups, the stock of outstanding volumes is shown as the average percentage deviation from the average during MP6. Rates are expressed in basis point deviations from the average rate in MP6. The vertical broken lines indicate the start of MP7 (with the introduction of the two-tier system), the start of MP8 and the 2019 year-end. Latest observations: 25 January 2020.

In September 2019 the ECB decided to introduce a two-tier system for the remuneration of excess liquidity holdings to support the bank-based transmission of monetary policy. The initial experience with this system suggests that sufficient excess liquidity remains subject to the DFR to ensure a continued effective transmission of negative policy rates in euro area money markets.[117] Under the two-tier system, parts of credit institutions' excess liquidity holdings with the Eurosystem are currently remunerated at 0% instead of at the DFR. This provides incentives for banks holding less excess liquidity than their exempt allowance to borrow additional reserves at any rate below 0% and deposit them with the central bank at a profit. Banks that had unused allowances before the introduction of the two-tier system have therefore substantially increased their money market borrowing activity in the secured segment (see Chart C, left panel). At the same time, the borrowing activity of banks in the unsecured segment remained limited and mostly confined to specific domestic money markets. Accordingly, while repo rates have experienced limited and temporary upward pressure due to the increased trading activity (see Chart C, right panel), unsecured benchmark rates have remained largely unchanged. The two-tier system has thus partially revived demand for reserves, but money market rates have remained broadly stable and closely anchored to the DFR.[118]

[117] In September 2019 the Governing Council decided to introduce a two-tier reserve remuneration system to support the bank-based transmission of monetary policy. The system has been implemented since 30 October 2019.

[118] See also the box entitled "Market reaction to the two-tier system", *Economic Bulletin*, Issue 8, ECB, 2019.

4 Impact on the broader economy

The overall impact of NIRP on loan growth derives from both the funding cost relief granted by the policy rate cut and the non-standard channels activated when rates move into negative territory. As is also the case with standard rate cuts, NIRP exerts an easing effect which operates through the bank lending channel of monetary policy transmission and stems primarily from a reduction in bank funding costs. This first-order effect, however, may differ in magnitude from that of a policy rate cut in positive territory since, as explained above, negative rates give rise to some specific frictions, while also activating additional channels, which can result in a multiplication of the stimulus provided by the monetary policy accommodation, especially as regards loan creation.

The compression in funding costs not related to retail deposits activated a bank lending channel that accounted for an expansion of aggregate corporate loan growth by around 0.4 percentage points. Funding options for banks include not only deposits of households and firms but also debt securities, Eurosystem funding, deposits of other financial institutions and governments, money market funds and external liabilities. Even under the conservative assumption that all deposits of the non-financial private sector, irrespective of their size, are bound at zero, the sum of all these funds still leaves around two-thirds of funding sources that can be remunerated at rates below zero. According to past regularities, this funding cost relief would have stimulated loan growth by around 0.4 percentage points on average, as envisaged under a standard bank lending channel of propagation to the broader economy.[119] It is important to note that this is a conservative estimate, not only because deposit rates actually declined by 0.6 percentage points but also because it abstracts from the compression of risk and term premia.[120]

A review of available empirical studies suggests that non-standard channels support aggregate loan supply, leading to an additional increase in annual corporate loan growth of around 0.3 percentage points (see Chart 7). Negative interest rates exert pressure on the intermediation margins of banks that rely more on retail deposits, leading healthier banks to expand their loan supply or to try and maintain profitability via search-for-yield.[121] Conversely, weaker banks with limited capacity to expand credit supply or increase risk may keep lending rates unchanged or even be forced to increase them. This has been referred to in the economic literature

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119 Albertazzi, U., Nobili, A. and Signoretti, F., "The bank lending channel of conventional and unconventional monetary policy", forthcoming, and Basten, C., and Mariathasan, M., "How Banks Respond to Negative Interest Rates: Evidence from the Swiss Exemption Threshold", *CESifo Working Paper Series*, No 6901, 2018, argue that the bank lending channel remains active even under NIRP, while Borio, C., and Gambacorta, L., "Capital regulation, risk-taking and monetary policy: a missing link in the transmission mechanism?", *BIS Working Papers*, No 268, 2017, point out that this channel is less effective in a low interest rate environment.

120 At the same time, reliance on retail funding varies considerably across countries and across bank business models.

121 See Heider, F. et al., op. cit.; Demiralp, S. et al., op. cit.; and Grandi, P. and Guille, M., "The Upside Down: French Banks, Deposits and Negative Policy Rates", *mimeo*, 2020.

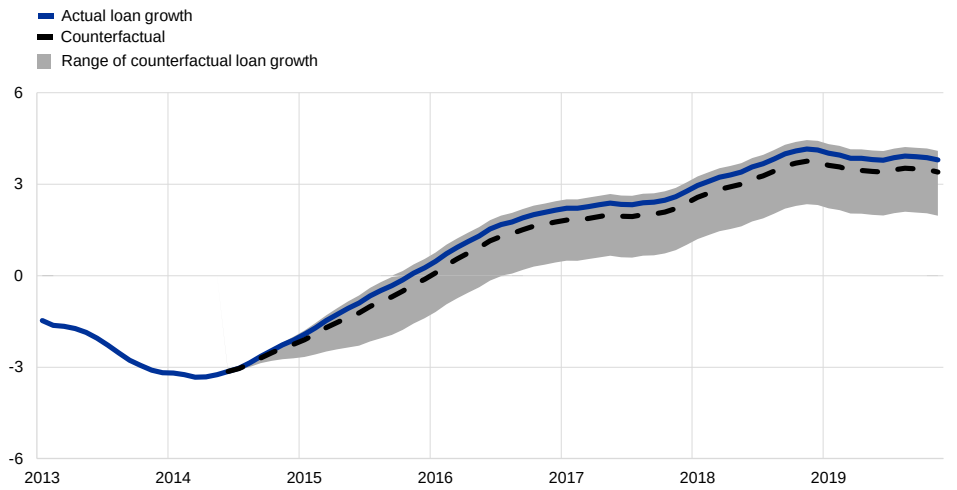
as the "reversal rate".[122] Other studies focus on the weight of liquid assets in banks' balance sheets or the self-reported impact of the policy on banks.[123] For each study and each key characteristic, we compute the growth of bank loans to firms that would have emerged if the ECB had not adopted NIRP in 2014. We then order these counterfactuals depending on the resulting loan growth, and report their median (the dashed black line in Chart 7) and their overall range (grey area), spanning values from just above the actual loan growth (blue line) to well below it. In the absence of NIRP, loan growth for banks negatively affected by the policy (related to the income loss implied by the hard bound on retail deposit rates) would have been 0.3 percentage points higher than the observed loan growth. At the same time, loan growth would have been substantially lower for banks whose lending was positively affected by the policy (-0.5 percentage points each year being the median across studies, with estimates as low as -1.6 percentage points at the bottom of the range). Taking into account the whole set of available empirical analyses, the counterfactual loan growth in the absence of NIRP would have been lower by around 0.3 percentage points each year.

[122] See Brunnermeier, M. and Koby, Y., "The Reversal Interest Rate", *NBER Working Papers*, No 25406, December 2018. Eggertsson, G.B., Juelsrud, R.E., Summers, L.H. and Wold, E.G., "Negative Nominal Interest Rates and the Bank Lending Channel", *NBER Working Papers*, No 25416, January 2019, find an increase in lending rates for Sweden as a result of a policy rate cut into negative territory, although evidence is mixed, as highlighted in Erikson, H. and Vestin, D., "Pass-through at mildly negative policy rate: The Swedish case", Vox column, CEPR Policy Portal, 22 January 2019.

[123] For the relevance of liquid assets, see Bottero, M. et al., op. cit. For the self-reported impact of NIRP, see Altavilla, C., Boucinha, M., Holton, S. and Ongena, S., "Credit supply and demand in unconventional times", *Working Paper Series*, No 2202, ECB, November 2018; and Arce, Ó., García-Posada, M., Mayordomo, S. and Ongena, S., "Adapting lending policies when negative interest rates hit banks' profits", *Working Papers*, No 1832, Banco de España, 2018.

Chart 7

Estimated impact of NIRP on bank loans to firms



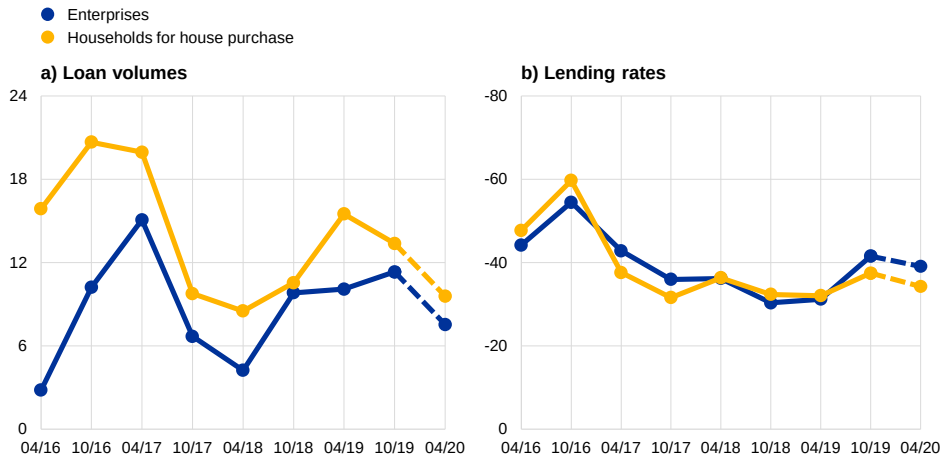
Sources: Altavilla, C. et al., "Credit supply and demand in unconventional times", op. cit.; Arce, Ó. et al., op. cit.; Bubeck, J., Maddaloni, A. and Peydró, J.-L., "Negative Monetary Policy Rates and Systemic Banks' Risk-Taking: Evidence from the Euro Area Securities Register," *Working Papers*, No 1128, Barcelona Graduate School of Economics, November 2019; Bottero, M. et al., op. cit.; Demiralp, S. et al., op. cit.; Grandi, P. and Guille, M., op. cit.; Heider, F. et al., op. cit.; and Tan, G., "Beyond the zero lower bound: negative policy rates and bank lending", *DNB Working Paper*, No 649, September 2019.
Notes: The blue line is the actual annual NFC loan growth (six-month moving average). The grey area represents the dispersion in loan growth among banks according to their exposure to NIRP-specific effects, corresponding to one standard deviation of the key bank characteristic from the bottom tercile of the distribution as identified by various contributions in the literature (deposit ratio, liquidity ratio, BLS response to NIRP question). The relative response for a standard deviation above (below) the mean is computed as the maximum (minimum) response as gathered from studies in the literature, adapted to take into account the different formulation of the empirical exercises and normalised for each sample's specificities (period and country). The dashed line represents the median across all studies.

Overall, empirical evidence points to a positive impact of NIRP on loan growth (of around 0.7 percentage points each year), an assessment which is corroborated by survey evidence from the euro area BLS (see Chart 8). A consistently positive net percentage of euro area banks have been reporting that the negative DFR led to higher loan volumes (panel a). On average, 10% of banks in net percentage terms reported that the negative DFR led to an increase in loan volumes to enterprises, while the share was 15% for loans to households for house purchases.[124] Consistent with the expansion in credit supply, the decrease in lending rates was even more widespread, with around 40% of banks reporting a compression of lending rates in net terms for both enterprises and households for house purchases.

[124] See Altavilla, C., Andreeva, D.C., Boucinha, M. and Holton, S., "Monetary policy, credit institutions and the bank lending channel in the euro area", *Occasional Paper Series*, No 222, ECB, May 2019.

Chart 8

Impact of negative DFR on lending conditions as reported by banks in the BLS



Source: ECB (euro area BLS).
Notes: Responses refer to the questions on the impact of the negative DFR on lending volumes (panel a) and lending rates (panel b) over the six months ending at the date on the x-axis. Observations for April 2020 correspond to the expected impact over the six months ending in April 2020. The net percentage is the percentage of banks reporting a positive impact minus the percentage of banks reporting a negative impact. Figures at the country level are weighted by volume of loans to obtain aggregate figures for the euro area. Latest observation: October 2019.

Negative rates, in conjunction with the other policy measures, have contributed to the euro area expansion and supported inflation expectations. According to estimates carried out by Eurosystem staff, at the end of 2019 the level of real GDP was between 2.5 and 3.0 percentage points higher than it would have been in the absence of the unconventional measures that the ECB has taken since the middle of 2014. The policy contribution to the euro area inflation rate is estimated to have been on average between one-third and one-half of a percentage point per year until 2019. Identifying the contribution of each individual instrument is difficult because of the interaction among these policy tools (a feature that has often prompted the ECB to combine them in a policy package). However, one tentative way to isolate the contribution of NIRP is to run its estimated yield impact, as documented in Box 1, through macroeconomic models. These estimates suggest that around one-sixth of the overall cumulated impact on GDP growth is attributable to NIRP as a stand-alone instrument. This represents a tangible contribution, considering the overall limited rate adjustments in negative territory.[125] NIRP is found to explain a similar share of the overall policy effect on inflation. As acknowledged above, these estimates provide a conservative assessment of the contribution of NIRP, which is reinforced by its complementarity with other monetary policy tools.

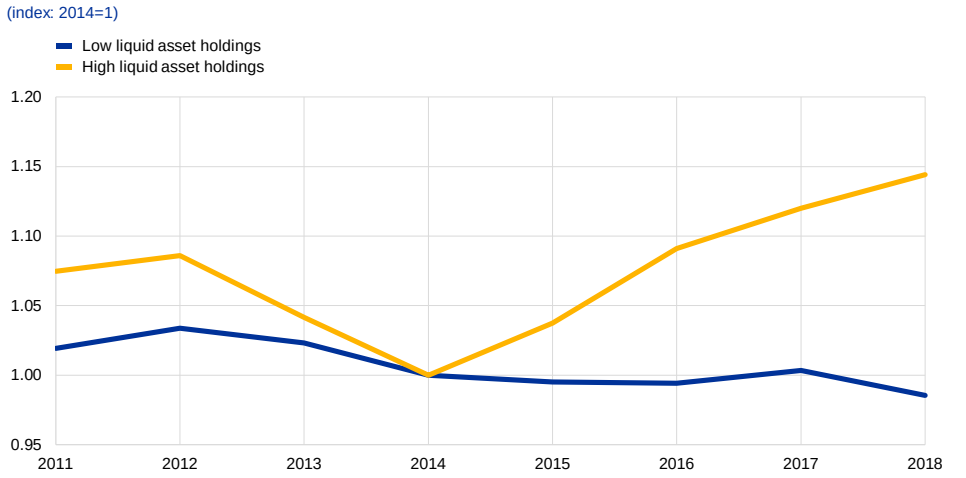
There are reasons to believe that the impact on the broader economy goes beyond the transmission via bank lending. Additional channels emerge or are strengthened as the policy rate moves deeper into negative territory. One example is the effect of NIRP on the remuneration of liquid assets in which the corporate sector usually invests. NIRP compresses the remuneration of liquid assets, and is passed on to corporate deposits as policy rates move deeper into negative territory and expectations of a future rate hike move further into the future. Using information from

[125] The methodology used here is explained in detail in Rostagno, M. et al., op. cit.

more than 300 banks and 3 million firms operating in 19 euro area countries, Chart 9 shows different patterns in the non-financial investment of firms exposed to negative deposit rates, distinguishing them according to their holdings of liquid assets.[126] Firms with large holdings of liquid assets subject to negative deposit rates have an incentive to reduce these liquid assets by increasing non-financial investment (yellow line). By contrast, firms that have low liquid asset holdings and are therefore not particularly affected by negative deposit rates did not show such an acceleration (blue line). Formal econometric analysis of this corporate channel suggests that it is capable of adding 1 percentage point to aggregate business investment. In line with this empirical finding, a private sector survey of 500 German firms conducted in July-August 2019 found that, in the face of negative deposit rates, 32% of firms invested more in their own business.[127]

Chart 9

Investment growth of firms exposed to negative deposit rates



Source: Altavilla, C., Burlon, L., Giannetti, M. and Holton, S., "The impact of negative interest rates on banks and firms", Vox column, CEPR Policy Portal, 8 November 2019.
Notes: Investment growth orthogonal to firm fixed effects and normalised to 1 in 2014. Latest observation: 2018.

5 Concluding remarks

The stimulus to the broader economy provided by NIRP has been effective in inducing an easing of financing conditions and thereby, ultimately, contributing to price stability. The interest rate cut has been channelled through both standard and non-standard transmission mechanisms, generating a reduction in bank funding costs and spurring loan creation. Effects were heterogeneous across bank characteristics. However, the dispersion in some bank responses does not challenge the overall positive first-order effect of NIRP on financing conditions. Notwithstanding the potential headwinds to transmission discussed above, as yet there is no sign that the stimulus provided by the measure has been exhausted, as new channels emerge

126 See Altavilla, C. et al., "The impact of negative interest rates on banks and firms", op. cit.

127 See "Zwischen Sicherheit und Chance: Wie der Mittelstand anlegt", market study by Commerzbank in cooperation with Forsa, 16 October 2019.

while others fade away. Ultimately, the macroeconomic response has been sizeable and has helped to bring inflation closer to the ECB's aim.

Protracted periods of negative rates do, however, have the potential to hinder the transmission of monetary policy. Prolonged periods of negative rates are qualitatively different from brief, "experimental" periods. If negative policy rates had proved to be short-lived, they might have become a mere footnote in central banking history. As negative rates persist, however, banks react to them to avoid the negative effects on profitability, although their leeway to do so is eroded over time. In the current euro area monetary policy environment, the effects of a long period of negative rates require continuous and careful monitoring as we venture further into uncharted territory.

Overall, NIRP still largely benefits the macroeconomic outlook and price stability. In order to support the bank-based transmission of monetary policy, the ECB has adopted a two-tier system for reserve remuneration. In parallel, specific risks to financial stability are addressed by action from other policy areas, which are specifically mandated to tackle phenomena and behaviours associated with such risks. Microprudential supervision monitors banks' risk-taking behaviour, and so far it has provided an adequate set of incentives for intermediaries to calibrate their risk attitude to the macroeconomic circumstances. Moreover, national and supranational macroprudential authorities can effectively monitor and respond to localised house price bubbles and other threats to financial stability. Such mitigating action allows the euro area economy to continue to benefit from the significant and necessary stimulative impact of NIRP, which has proven to be an integral and effective part of the ECB's policy response to past and current challenges.

Statistics

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Further information

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

Conventions used in the tables

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

1 External environment

1.1 Main trading partners, GDP and CPI

	GDP [1] (period-on-period percentage changes)						CPI (annual percentage changes)						
	G20	United States	United Kingdom	Japan	China	Memo item: euro area	OECD countries		United States	United Kingdom (HICP)	Japan	China	Memo item: euro area [2] (HICP)
							Total	excluding food and energy					
	1	2	3	4	5	6	7	8	9	10	11	12	13
2017	3.9	2.4	1.9	2.2	6.8	2.5	2.3	1.8	2.1	2.7	0.5	1.6	1.5
2018	3.7	2.9	1.3	0.3	6.6	1.9	2.6	2.1	2.4	2.5	1.0	2.1	1.8
2019	2.9	.	1.4	0.7	6.1	1.2	2.0	2.2	1.8	1.8	0.5	2.9	1.2
2019 Q2	0.7	0.5	-0.2	0.6	1.6	0.1	2.3	2.2	1.8	2.0	0.8	2.6	1.4
Q3	0.8	0.5	0.5	0.0	1.4	0.3	1.9	2.2	1.8	1.8	0.3	2.9	1.0
Q4	0.6	0.5	0.0	-1.8	1.5	0.1	1.9	2.1	2.0	1.4	0.5	4.3	1.0
2020 Q1	.	-1.2	.	.	-9.8	-3.8	.	.	2.1	1.7	0.5	5.0	1.1
2019 Nov.	-	-	-	-	-	-	1.9	2.2	2.1	1.5	0.5	4.5	1.0
Dec.	-	-	-	-	-	-	2.1	2.2	2.3	1.3	0.8	4.5	1.3
2020 Jan.	-	-	-	-	-	-	2.4	2.2	2.5	1.8	0.7	5.4	1.4
Feb.	-	-	-	-	-	-	2.3	2.2	2.3	1.7	0.4	5.2	1.2
Mar.	-	-	-	-	-	-	.	.	1.5	1.5	0.4	4.3	0.7
Apr. [3]	-	-	-	-	-	-	.	.	.	.	.	.	0.4

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
2017	53.2	54.3	54.7	52.5	51.8	56.4	53.8	53.8	52.8	5.9	3.1	7.8
2018	53.4	55.0	53.3	52.1	52.3	54.6	53.1	53.8	50.8	4.4	3.1	5.2
2019	51.7	52.5	50.2	50.5	51.8	51.3	50.3	52.2	48.8	-0.5	0.3	-1.0
2019 Q2	51.5	51.8	50.5	50.8	51.6	51.8	50.4	51.9	49.4	-0.6	-1.4	-0.1
Q3	51.4	51.4	50.1	51.3	51.4	51.2	50.4	51.7	48.5	1.3	1.5	1.2
Q4	51.3	51.9	49.5	49.2	52.6	50.7	51.3	51.3	49.5	-0.8	-3.0	0.7
2020 Q1	46.2	47.9	47.8	44.4	42.0	44.2	46.9	46.0	46.1	.	.	.
2019 Nov.	51.6	52.0	49.3	49.8	53.2	50.6	51.7	51.5	49.5	0.0	-1.8	1.1
Dec.	51.6	52.7	49.3	48.6	52.6	50.9	51.1	51.8	49.5	-0.8	-3.0	0.7
2020 Jan.	52.4	53.3	53.3	50.1	51.9	51.3	51.3	52.7	49.5	-1.4	-3.6	0.1
Feb.	45.0	49.6	53.0	47.0	27.5	51.6	42.6	45.9	44.4	-1.9	-2.8	-1.3
Mar.	41.3	40.9	37.1	36.2	46.7	29.7	46.7	39.4	44.4	.	.	.
Apr.	.	27.4	.	.	.	13.5	.	.	.	.	.	.

Sources: Markit (col. 1-9); CPB Netherlands Bureau for Economic Policy Analysis and ECB calculations (col. 10-12).
1) Global and advanced economies exclude the euro area. Annual and quarterly data are period-on-period percentages; monthly data are 3-month-on-3-month percentages. All data are seasonally adjusted.
2) Excluding the euro area.

2 Financial developments

2.1 Money market interest rates

(percentages per annum; period averages)

	Euro area [1]						United States	Japan
	Euro short-term rate (€STR) [2]	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	8
2017	-	-0.35	-0.37	-0.33	-0.26	-0.15	1.26	-0.02
2018	-0.45	-0.36	-0.37	-0.32	-0.27	-0.17	2.31	-0.05
2019	-0.48	-0.39	-0.40	-0.36	-0.30	-0.22	2.33	-0.08
2019 Sep.	-0.49	-0.40	-0.45	-0.42	-0.39	-0.34	2.13	-0.09
Oct.	-0.55	-0.46	-0.46	-0.41	-0.36	-0.30	1.98	-0.11
Nov.	-0.54	-0.45	-0.45	-0.40	-0.34	-0.27	1.90	-0.10
Dec.	-0.54	-0.46	-0.45	-0.39	-0.34	-0.26	1.91	-0.06
2020 Jan.	-0.54	-0.45	-0.46	-0.39	-0.33	-0.25	1.82	-0.05
Feb.	-0.54	-0.45	-0.47	-0.41	-0.36	-0.29	1.68	-0.07
Mar.	-0.53	-0.45	-0.48	-0.42	-0.36	-0.27	1.10	-0.09

Source: ECB.

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

2) The ECB published the euro short-term rate (€STR) for the first time on 2 October 2019, reflecting trading activity on 1 October 2019. Data on previous periods refer to the pre-€STR, which was published for information purposes only and not intended for use as a benchmark or reference rate in any market transactions.

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
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	-0.80	-0.75	-0.66	-0.26	0.32	1.07	0.08	0.51	-0.67	-0.45	0.44	1.17
2019	-0.68	-0.66	-0.62	-0.45	-0.14	0.52	0.34	0.24	-0.62	-0.52	-0.13	0.41
2019 Sep.	-0.70	-0.76	-0.81	-0.77	-0.52	0.24	-0.10	0.03	-0.83	-0.86	-0.58	-0.02
Oct.	-0.67	-0.69	-0.69	-0.62	-0.36	0.32	0.17	-0.01	-0.70	-0.69	-0.41	0.14
Nov.	-0.61	-0.63	-0.65	-0.57	-0.30	0.34	0.18	0.04	-0.66	-0.65	-0.33	0.23
Dec.	-0.68	-0.66	-0.62	-0.45	-0.14	0.52	0.34	0.24	-0.62	-0.52	-0.13	0.41
2020 Jan.	-0.62	-0.65	-0.68	-0.64	-0.40	0.26	0.06	-0.11	-0.69	-0.71	-0.46	0.10
Feb.	-0.68	-0.74	-0.79	-0.78	-0.57	0.16	0.13	-0.06	-0.80	-0.85	-0.64	-0.13
Mar.	-0.70	-0.69	-0.71	-0.67	-0.41	0.28	0.49	0.22	-0.70	-0.73	-0.48	0.09

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 Euro MTS Ltd 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
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	375.5	3,386.6	766.3	264.9	697.3	336.0	173.1	629.5	502.5	278.8	292.9	800.5	2,746.2	22,310.7
2019	373.6	3,435.2	731.7	270.8	721.5	324.4	155.8	650.9	528.2	322.0	294.2	772.7	2,915.5	21,697.2
2019 Sep.	379.7	3,514.5	738.2	271.3	751.1	319.7	151.8	669.4	545.0	338.5	294.7	804.3	2,982.2	21,585.5
Oct.	382.8	3,551.2	748.2	273.3	742.2	316.6	157.0	671.1	556.8	341.4	306.7	791.7	2,977.7	22,197.5
Nov.	398.4	3,693.1	794.5	283.0	761.3	328.8	163.6	711.6	585.2	339.4	304.8	837.7	3,107.2	23,278.1
Dec.	400.9	3,715.3	799.3	290.0	755.9	322.8	165.1	716.0	598.5	341.8	295.3	862.5	3,178.9	23,660.4
2020 Jan.	406.9	3,758.2	791.2	295.5	758.6	324.6	166.1	728.8	624.6	362.0	291.6	886.8	3,278.4	23,642.9
Feb.	407.1	3,734.9	797.3	292.3	734.5	301.0	168.4	722.8	635.8	391.4	298.1	895.0	3,282.5	23,180.4
Mar.	308.5	2,824.2	622.6	233.6	578.8	210.5	116.1	519.9	500.5	315.7	242.6	731.2	2,652.4	18,974.0

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
2019 Mar.	0.03	0.41	0.30	0.76	5.90	16.65	5.41	5.61	6.17	2.36	1.59	1.82	1.83	1.81	2.06	1.78
Apr.	0.03	0.41	0.32	0.75	5.88	16.66	5.56	5.63	6.19	2.36	1.59	1.78	1.77	1.77	2.02	1.75
May	0.03	0.44	0.31	0.79	5.81	16.67	5.61	5.76	6.34	2.33	1.57	1.80	1.73	1.74	1.99	1.72
June	0.03	0.44	0.32	0.82	5.81	16.63	5.42	5.67	6.24	2.31	1.55	1.74	1.67	1.65	1.95	1.67
July	0.03	0.43	0.31	0.80	5.75	16.58	5.74	5.73	6.30	2.34	1.55	1.72	1.59	1.57	1.90	1.61
Aug.	0.03	0.43	0.28	0.78	5.75	16.60	6.15	5.75	6.35	2.25	1.51	1.69	1.54	1.50	1.84	1.56
Sep.	0.03	0.43	0.27	0.78	5.82	16.61	5.65	5.61	6.17	2.22	1.46	1.65	1.49	1.43	1.77	1.48
Oct.	0.03	0.42	0.24	0.83	5.70	16.63	5.88	5.55	6.19	2.26	1.45	1.59	1.44	1.39	1.74	1.44
Nov.	0.03	0.42	0.23	0.73	5.61	16.64	5.36	5.53	6.25	2.21	1.43	1.59	1.61	1.48	1.80	1.47
Dec.	0.03	0.42	0.22	0.80	5.58	16.56	5.44	5.28	5.89	2.09	1.46	1.58	1.43	1.39	1.75	1.41
2020 Jan.	0.02	0.42	0.27	0.73	5.62	16.63	5.63	5.69	6.24	2.21	1.46	1.52	1.43	1.40	1.72	1.43
Feb. [p]	0.02	0.36	0.32	0.71	5.63	16.60	5.51	5.57	6.14	2.21	1.43	1.54	1.38	1.36	1.70	1.41

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
2019 Mar.	0.03	0.07	0.62	2.17	2.17	2.38	2.30	1.66	1.58	1.68	1.19	1.36	1.57	1.65
Apr.	0.03	0.06	0.54	2.19	2.19	2.36	2.26	1.67	1.60	1.64	1.16	1.33	1.44	1.62
May	0.03	0.04	0.46	2.14	2.18	2.38	2.29	1.66	1.59	1.63	1.09	1.17	1.50	1.57
June	0.03	0.03	0.57	2.17	2.13	2.33	2.25	1.63	1.55	1.56	1.09	1.28	1.39	1.55
July	0.03	0.04	0.56	2.11	2.07	2.50	2.20	1.66	1.57	1.54	1.16	1.32	1.39	1.56
Aug.	0.03	-0.04	0.54	2.08	2.07	2.36	2.19	1.64	1.59	1.53	1.06	1.32	1.40	1.52
Sep.	0.03	-0.05	0.88	2.16	2.03	2.25	2.15	1.61	1.51	1.44	1.10	1.26	1.29	1.54
Oct.	0.02	-0.03	0.43	2.08	2.01	2.41	2.11	1.61	1.54	1.40	1.14	1.40	1.27	1.56
Nov.	0.02	-0.04	0.39	2.06	2.02	2.36	2.13	1.59	1.55	1.41	1.14	1.34	1.29	1.55
Dec.	0.01	0.00	0.42	2.09	2.00	2.28	2.08	1.58	1.54	1.39	1.26	1.21	1.37	1.55
2020 Jan.	0.01	-0.06	0.34	2.09	2.17	2.32	2.10	1.63	1.57	1.44	1.11	1.25	1.28	1.55
Feb. [p]	0.00	-0.12	0.33	2.07	1.99	2.29	2.11	1.57	1.54	1.41	1.11	1.22	1.25	1.52

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														
2017	1,240	519	155	.	70	438	57	367	167	54	.	37	79	31
2018	1,217	504	170	.	72	424	47	389	171	66	.	41	76	35
2019	1,277	550	175	.	84	406	61	415	177	80	.	47	73	38
2019 Sep.	1,392	597	185	.	105	439	66	412	156	88	.	48	81	41
Oct.	1,356	579	178	.	106	424	69	425	184	69	.	52	75	45
Nov.	1,341	570	178	.	102	425	66	374	148	77	.	44	75	30
Dec.	1,277	550	175	.	84	406	61	318	113	88	.	37	45	35
2020 Jan.	1,362	595	173	.	99	422	73	498	206	78	.	56	100	57
Feb.	1,383	596	195	.	104	414	74	425	172	100	.	48	68	37
Long-term														
2017	15,353	3,560	3,060	.	1,223	6,866	643	247	66	73	.	18	83	7
2018	15,746	3,688	3,162	.	1,247	7,022	627	228	64	68	.	15	75	6
2019	16,314	3,819	3,398	.	1,320	7,151	626	247	69	74	.	20	78	7
2019 Sep.	16,268	3,805	3,310	.	1,319	7,200	634	284	82	91	.	34	74	4
Oct.	16,220	3,802	3,326	.	1,316	7,153	623	274	61	98	.	24	85	6
Nov.	16,366	3,833	3,404	.	1,329	7,172	628	275	63	109	.	26	71	6
Dec.	16,314	3,819	3,398	.	1,320	7,151	626	164	58	66	.	14	24	2
2020 Jan.	16,430	3,856	3,437	.	1,324	7,188	625	341	118	87	.	16	110	10
Feb.	16,491	3,866	3,413	.	1,339	7,243	630	260	72	55	.	22	101	10

Source: ECB.

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

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

(EUR billions; percentage changes)

	Debt securities							Listed shares			
	Total	MFIs (including Eurosystem)	Non-MFI corporations			General government		Total	MFIs	Financial corporations other than MFIs	Non-financial corporations
			Financial corporations other than MFIs	FVCs	Non-financial corporations	Central government	Other general government				
	1	2	3	4	5	6	7	8	9	10	11
Oustanding amount											
2017	16,593.4	4,079.9	3,214.9	.	1,293.1	7,304.7	700.8	7,963.3	612.5	1,258.3	6,092.6
2018	16,962.4	4,192.8	3,331.7	.	1,318.7	7,445.8	673.4	7,033.1	465.0	1,108.9	5,459.2
2019	17,591.3	4,369.4	3,573.4	.	1,404.8	7,557.2	686.4	8,604.3	546.0	1,410.7	6,647.6
2019 Sep.	17,659.9	4,401.9	3,494.4	.	1,424.2	7,639.5	699.8	8,190.9	496.1	1,356.9	6,337.9
Oct.	17,576.5	4,380.9	3,503.7	.	1,421.7	7,577.4	692.8	8,265.6	508.2	1,369.0	6,388.3
Nov.	17,707.6	4,402.4	3,582.3	.	1,431.2	7,597.7	693.9	8,511.9	524.1	1,401.7	6,586.2
Dec.	17,591.3	4,369.4	3,573.4	.	1,404.8	7,557.2	686.4	8,604.3	546.0	1,410.7	6,647.6
2020 Jan.	17,792.0	4,450.7	3,610.4	.	1,423.7	7,609.8	697.3	8,487.1	525.3	1,391.5	6,570.4
Feb.	17,874.1	4,462.2	3,607.9	.	1,443.1	7,657.3	703.6	7,763.6	488.4	1,238.7	6,036.5
Growth rate											
2017	1.3	-0.5	0.1	.	6.0	2.2	0.4	1.0	6.1	2.8	0.2
2018	1.9	1.7	3.0	.	3.3	1.9	-4.3	0.7	0.3	2.4	0.4
2019	3.1	3.8	5.1	.	5.6	1.5	1.8	0.0	0.5	-0.1	0.0
2019 Sep.	3.1	4.3	3.5	.	5.0	1.8	3.1	-0.1	0.4	-0.1	-0.1
Oct.	2.9	3.9	4.0	.	5.2	1.5	1.3	-0.1	0.4	-0.1	-0.2
Nov.	3.0	3.9	4.8	.	6.3	1.3	1.6	-0.1	0.4	0.0	-0.2
Dec.	3.1	3.8	5.1	.	5.6	1.5	1.8	0.0	0.5	-0.1	0.0
2020 Jan.	3.2	4.1	5.7	.	5.7	1.4	2.0	0.0	0.5	-0.1	0.0
Feb.	3.1	3.5	5.4	.	6.0	1.5	2.4	0.0	0.5	-0.1	0.1

Source: ECB.

2 Financial developments

2.8 Effective exchange rates [1)]

(period averages; index: 1999 Q1=100)

	EER-19						EER-38	
	Nominal	Real CPI	Real PPI	Real GDP deflator	Real ULCM	Real ULCT	Nominal	Real CPI
	1	2	3	4	5	6	7	8
2017	96.6	91.4	91.9	86.0	79.9	90.3	112.0	90.0
2018	98.9	93.4	93.4	87.2	80.1	91.3	117.9	93.8
2019	97.3	91.2	91.8	85.7	78.6	88.8	116.7	91.5
2019 Q2	97.3	91.4	91.7	85.6	78.2	88.9	116.8	91.8
Q3	97.7	91.4	91.8	86.0	78.9	89.1	116.9	91.5
Q4	97.0	90.4	91.4	85.5	78.1	88.2	116.2	90.5
2020 Q1	96.7	89.5	91.8	.	.	.	116.6	90.0
2019 Oct.	97.4	90.9	91.7	-	-	-	116.6	90.9
Nov.	96.7	90.2	91.1	-	-	-	116.0	90.3
Dec.	96.7	90.1	91.4	-	-	-	116.0	90.2
2020 Jan.	96.2	89.3	91.0	-	-	-	115.5	89.4
Feb.	95.6	88.7	90.9	-	-	-	114.9	88.8
Mar.	98.1	90.6	93.6	-	-	-	119.3	91.8
Percentage change versus previous month								
2020 Mar.	2.7	2.2	3.0	-	-	-	3.8	3.3
Percentage change versus previous year								
2020 Mar.	1.3	-0.5	2.3	-	-	-	2.7	0.3

Source: ECB.

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

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
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
2018	7.808	7.418	25.647	7.453	318.890	130.396	4.261	0.885	4.6540	10.258	1.155	1.181
2019	7.735	7.418	25.670	7.466	325.297	122.006	4.298	0.878	4.7453	10.589	1.112	1.119
2019 Q2	7.672	7.418	25.686	7.467	322.973	123.471	4.282	0.875	4.7480	10.619	1.126	1.124
Q3	7.800	7.394	25.734	7.463	328.099	119.323	4.318	0.902	4.7314	10.662	1.096	1.112
Q4	7.801	7.439	25.577	7.471	331.933	120.323	4.287	0.861	4.7666	10.652	1.096	1.107
2020 Q1	7.696	7.490	25.631	7.472	339.137	120.097	4.324	0.862	4.7973	10.669	1.067	1.103
2019 Oct.	7.845	7.436	25.689	7.469	331.462	119.511	4.301	0.875	4.7538	10.802	1.098	1.105
Nov.	7.757	7.440	25.531	7.472	333.617	120.338	4.285	0.858	4.7698	10.650	1.098	1.105
Dec.	7.797	7.442	25.497	7.472	330.706	121.241	4.273	0.847	4.7779	10.483	1.093	1.111
2020 Jan.	7.683	7.443	25.216	7.473	334.380	121.363	4.251	0.849	4.7788	10.554	1.076	1.110
Feb.	7.630	7.454	25.051	7.471	337.171	120.026	4.277	0.841	4.7837	10.568	1.065	1.091
Mar.	7.768	7.571	26.575	7.470	345.682	118.897	4.441	0.895	4.8282	10.875	1.059	1.106
Percentage change versus previous month												
2020 Mar.	1.8	1.6	6.1	0.0	2.5	-0.9	3.8	6.4	0.9	2.9	-0.5	1.5
Percentage change versus previous year												
2020 Mar.	2.4	2.0	3.5	0.1	9.4	-5.4	3.3	4.2	1.5	3.6	-6.4	-2.1

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)												
2019 Q1	26,555.6	26,818.9	-263.3	11,090.1	9,070.3	9,137.7	11,200.9	-92.3	5,679.0	6,547.8	741.1	14,639.8
Q2	26,701.6	27,003.5	-301.9	10,941.0	9,050.9	9,242.1	11,374.0	-75.5	5,823.2	6,578.6	770.8	14,760.0
Q3	27,793.7	27,946.5	-152.8	11,333.5	9,364.6	9,630.7	11,849.2	-91.0	6,093.5	6,732.7	827.0	15,112.7
Q4	27,555.9	27,618.4	-62.6	11,207.0	9,322.3	9,905.8	11,943.5	-48.5	5,678.0	6,352.7	813.6	14,517.2
Outstanding amounts as a percentage of GDP												
2019 Q4	231.4	232.0	-0.5	94.1	78.3	83.2	100.3	-0.4	47.7	53.4	6.8	121.9
Transactions												
2019 Q1	367.7	275.5	92.2	110.4	6.8	61.7	149.1	5.4	187.4	119.6	2.8	-
Q2	187.0	189.1	-2.1	-86.4	4.4	52.1	103.8	32.8	185.8	81.0	2.8	-
Q3	491.5	386.1	105.4	178.4	151.8	151.3	192.6	4.2	157.4	41.7	0.1	-
Q4	-282.7	-365.5	82.8	-74.8	-46.1	140.1	9.7	-5.4	-340.0	-329.1	-2.5	-
2019 Sep.	58.6	6.9	51.7	43.9	33.8	69.2	75.5	-2.1	-46.4	-102.4	-5.9	-
Oct.	60.6	13.3	47.2	5.9	-36.0	55.3	21.6	6.4	-7.9	27.8	0.9	-
Nov.	47.4	21.0	26.3	21.8	52.6	55.6	15.3	0.3	-26.4	-46.9	-3.9	-
Dec.	-390.6	-399.8	9.2	-102.4	-62.7	29.2	-27.2	-12.1	-305.7	-309.9	0.5	-
2020 Jan.	399.8	396.0	3.9	21.4	4.4	86.7	121.6	8.1	282.7	269.9	1.0	-
Feb.	165.5	120.9	44.6	34.1	11.3	30.3	28.9	15.0	87.3	80.7	-1.1	-
12-month cumulated transactions												
2020 Feb.	1,023.0	714.9	308.1	92.1	100.2	482.1	508.1	59.7	383.7	106.6	5.4	-
12-month cumulated transactions as a percentage of GDP												
2020 Feb.	8.6	6.0	2.6	0.8	0.8	4.0	4.3	0.5	3.2	0.9	0.0	-

Source: ECB.

1) Net financial derivatives are included in total assets.

3 Economic activity

3.1 GDP and expenditure components

(quarterly data seasonally adjusted; annual data unadjusted)

	GDP											
	Total	Domestic demand								External balance [1]		
		Total	Private consumption	Government consumption	Gross fixed capital formation				Changes in inventories [2]	Total	Exports [1]	Imports [1]
						Total construction	Total machinery	Intellectual property products				
	1	2	3	4	5	6	7	8	9	10	11	12
	Current prices (EUR billions)											
2017	11,200.9	10,709.5	6,036.4	2,296.9	2,306.0	1,102.1	708.5	488.9	70.2	491.4	5,295.9	4,804.5
2018	11,561.5	11,062.7	6,207.6	2,363.3	2,408.1	1,175.6	743.8	481.8	83.7	498.8	5,547.7	5,048.9
2019	11,906.7	11,434.6	6,362.1	2,444.8	2,605.5	1,253.5	767.6	577.1	22.1	472.1	5,719.3	5,247.2
2019 Q1	2,950.9	2,819.8	1,575.6	603.3	628.2	310.5	190.7	125.2	12.6	131.1	1,422.8	1,291.7
Q2	2,967.9	2,866.8	1,589.4	609.0	658.0	307.0	189.9	159.3	10.4	101.1	1,426.7	1,325.6
Q3	2,987.2	2,851.8	1,596.7	613.8	641.9	315.1	192.5	132.4	-0.5	135.3	1,434.8	1,299.5
Q4	3,006.3	2,895.5	1,602.7	618.7	673.2	318.7	194.0	158.7	0.9	110.8	1,442.1	1,331.3
	as a percentage of GDP											
2019	100.0	96.0	53.4	20.5	21.9	10.5	6.4	4.8	0.2	4.0	-	-
	Chain-linked volumes (prices for the previous year)											
	quarter-on-quarter percentage changes											
2019 Q2	0.1	1.4	0.2	0.4	5.0	-1.0	0.0	27.2	-	-	0.0	2.7
Q3	0.3	-0.6	0.5	0.6	-3.8	1.2	0.0	-18.0	-	-	0.6	-1.4
Q4	0.1	1.0	0.1	0.4	4.4	0.2	0.1	20.7	-	-	0.3	2.2
2020 Q1	-3.8	.	.	.	.	.	.	.	-	-	.	.
	annual percentage changes											
2017	2.5	2.2	1.7	1.3	3.4	3.6	4.1	2.3	-	-	5.5	5.0
2018	1.9	1.6	1.4	1.1	2.3	3.3	4.3	-2.7	-	-	3.3	2.8
2019	1.2	1.8	1.3	1.7	5.7	3.2	1.8	18.1	-	-	2.5	3.8
2019 Q2	1.2	2.5	1.2	1.4	8.2	2.1	1.9	33.2	-	-	2.3	5.1
Q3	1.3	1.2	1.5	2.0	3.1	3.0	0.7	7.1	-	-	2.7	2.6
Q4	1.0	1.8	1.2	1.8	6.4	2.0	0.8	25.5	-	-	1.9	3.8
2020 Q1	-3.3	.	.	.	.	.	.	.	-	-	.	.
	contributions to quarter-on-quarter percentage changes in GDP; percentage points											
2019 Q2	0.1	1.3	0.1	0.1	1.1	-0.1	0.0	1.2	0.1	-1.1	-	-
Q3	0.3	-0.6	0.3	0.1	-0.8	0.1	0.0	-1.0	-0.2	0.9	-	-
Q4	0.1	0.9	0.1	0.1	0.9	0.0	0.0	0.9	-0.1	-0.8	-	-
2020 Q1	-3.8	.	.	.	.	.	.	.	.	.	-	-
	contributions to annual percentage changes in GDP; percentage points											
2017	2.5	2.1	0.9	0.3	0.7	0.3	0.3	0.1	0.2	0.4	-	-
2018	1.9	1.5	0.8	0.2	0.5	0.3	0.3	-0.1	0.0	0.4	-	-
2019	1.2	1.7	0.7	0.3	1.2	0.3	0.1	0.7	-0.5	-0.5	-	-
2019 Q2	1.2	2.3	0.6	0.3	1.7	0.2	0.1	1.4	-0.3	-1.2	-	-
Q3	1.3	1.1	0.8	0.4	0.6	0.3	0.0	0.3	-0.7	0.2	-	-
Q4	1.0	1.8	0.6	0.4	1.3	0.2	0.0	1.1	-0.6	-0.7	-	-
2020 Q1	-3.3	.	.	.	.	.	.	.	.	.	-	-

Sources: Eurostat and ECB calculations.

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

2) Including acquisitions less disposals of valuables.

3 Economic activity

3.2 Value added by economic activity

(quarterly data seasonally adjusted; annual data unadjusted)

	Gross value added (basic prices)											Taxes less subsidies on products
	Total	Agriculture, forestry and fishing	Manufacturing energy and utilities	Const-ruction	Trade, transport, accom-modation and food services	Infor-mation and com-munica-tion	Finance and insurance	Real estate	Professional, business and support services	Public ad-ministration, education, health and social work	Arts, enter-tainment and other services	
	1	2	3	4	5	6	7	8	9	10	11	12
	Current prices (EUR billions)											
2017	10,040.0	176.3	1,991.5	503.1	1,909.9	468.8	465.9	1,132.7	1,143.5	1,897.7	350.5	1,160.9
2018	10,356.9	177.9	2,039.7	537.9	1,968.6	488.6	472.0	1,167.0	1,194.9	1,955.1	355.2	1,204.6
2019	10,665.6	179.8	2,048.8	580.4	2,031.8	513.8	480.6	1,205.5	1,240.7	2,020.3	364.0	1,241.1
2019 Q1	2,644.4	44.7	515.2	142.8	503.4	125.8	119.0	297.9	306.2	499.2	90.1	306.5
Q2	2,659.8	45.0	512.5	144.1	506.6	128.1	120.0	300.1	309.6	502.8	91.0	308.1
Q3	2,673.6	45.0	511.6	146.1	509.9	128.8	120.7	302.3	311.6	506.5	91.1	313.5
Q4	2,693.7	45.2	513.1	148.0	512.8	131.3	120.8	305.2	313.6	512.0	91.6	312.6
	as a percentage of value added											
2019	100.0	1.7	19.2	5.4	19.0	4.8	4.5	11.3	11.6	18.9	3.4	-
	Chain-linked volumes (prices for the previous year)											
	quarter-on-quarter percentage changes											
2019 Q1	0.5	-0.3	-0.1	1.5	1.1	1.2	0.9	0.5	0.0	0.2	0.7	0.4
Q2	0.1	-0.6	-0.5	-0.3	0.1	0.7	0.8	0.4	0.4	0.2	0.3	0.5
Q3	0.3	0.0	-0.4	0.6	0.3	1.5	0.7	0.4	0.3	0.3	0.1	0.8
Q4	0.1	0.4	-0.7	0.0	0.2	1.1	0.3	0.4	0.2	0.4	0.0	0.0
	annual percentage changes											
2017	2.6	0.7	3.3	2.6	2.9	5.4	1.1	0.6	4.4	1.6	1.5	2.4
2018	2.0	1.3	1.8	3.3	2.0	4.5	1.4	1.6	3.3	1.0	0.4	1.6
2019	1.2	-0.5	-1.1	3.1	1.8	4.2	2.1	1.6	1.7	1.1	1.3	1.5
2019 Q1	1.4	-0.6	-0.4	4.6	2.0	4.5	1.7	1.5	1.9	1.1	1.1	1.2
Q2	1.2	-1.0	-1.0	3.2	1.6	4.0	2.1	1.7	1.8	1.1	1.5	1.2
Q3	1.2	-0.1	-1.2	3.1	1.9	3.8	2.1	1.7	1.9	1.1	1.4	2.0
Q4	1.0	-0.4	-1.7	1.7	1.7	4.6	2.6	1.7	1.0	1.1	1.0	1.6
	contributions to quarter-on-quarter percentage changes in value added; percentage points											
2019 Q1	0.5	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	-
Q2	0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Q3	0.3	0.0	-0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	-
Q4	0.1	0.0	-0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	-
	contributions to annual percentage changes in value added; percentage points											
2017	2.6	0.0	0.7	0.1	0.5	0.2	0.1	0.1	0.5	0.3	0.1	-
2018	2.0	0.0	0.4	0.2	0.4	0.2	0.1	0.2	0.4	0.2	0.0	-
2019	1.2	0.0	-0.2	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.0	-
2019 Q1	1.4	0.0	-0.1	0.2	0.4	0.2	0.1	0.2	0.2	0.2	0.0	-
Q2	1.2	0.0	-0.2	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.1	-
Q3	1.2	0.0	-0.2	0.2	0.4	0.2	0.1	0.2	0.2	0.2	0.0	-
Q4	1.0	0.0	-0.3	0.1	0.3	0.2	0.1	0.2	0.1	0.2	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													
2017	100.0	85.6	14.4	3.2	14.6	6.0	24.9	2.8	2.5	1.0	13.8	24.3	6.9
2018	100.0	85.8	14.2	3.1	14.6	6.0	24.9	2.9	2.4	1.0	14.0	24.2	6.8
2019	100.0	86.0	14.0	3.0	14.6	6.1	24.9	2.9	2.4	1.0	14.0	24.3	6.8
annual percentage changes													
2017	1.6	2.0	-0.7	-0.5	1.1	1.4	1.8	3.4	-1.5	1.8	3.7	1.1	1.0
2018	1.5	1.8	-0.2	-0.4	1.5	2.4	1.4	3.5	-0.9	1.8	2.8	1.3	0.4
2019	1.2	1.5	-0.2	-1.7	0.8	2.4	1.2	3.7	-0.3	1.3	1.4	1.4	0.7
2019 Q1	1.4	1.6	0.3	-0.4	1.3	3.3	1.3	4.2	-0.4	2.5	1.8	1.4	0.2
Q2	1.2	1.5	-0.1	-2.9	1.0	2.6	1.3	4.2	-0.6	1.7	1.2	1.5	0.7
Q3	1.1	1.4	-0.4	-1.9	0.7	2.2	1.0	3.6	-0.2	0.8	1.2	1.5	0.9
Q4	1.1	1.4	-0.5	-1.6	0.4	1.6	1.2	3.0	0.2	0.1	1.2	1.4	1.0
Hours worked													
as a percentage of total hours worked													
2017	100.0	80.7	19.3	4.3	15.1	6.7	25.8	3.0	2.5	1.0	13.6	21.8	6.2
2018	100.0	81.0	19.0	4.2	15.0	6.8	25.7	3.0	2.5	1.0	13.8	21.8	6.1
2019	100.0	81.3	18.7	4.1	14.9	6.8	25.7	3.1	2.4	1.0	13.8	21.9	6.1
annual percentage changes													
2017	1.2	1.7	-1.1	-1.1	0.8	1.3	1.3	3.2	-2.0	1.5	3.5	0.5	0.4
2018	1.4	1.9	-0.3	0.4	1.3	2.7	1.1	3.2	-1.1	2.4	2.8	1.3	0.4
2019	1.1	1.4	-0.5	-1.4	0.5	2.2	1.0	2.7	-0.1	1.3	1.2	1.8	0.6
2019 Q1	1.7	2.0	0.4	0.3	1.3	4.0	1.6	3.4	0.0	1.7	1.8	1.9	0.5
Q2	0.9	1.3	-0.7	-3.0	0.4	2.6	0.8	2.8	-0.4	0.8	1.1	1.7	0.3
Q3	0.8	1.2	-0.9	-2.0	0.3	1.6	0.5	2.5	0.0	1.5	0.8	1.8	0.5
Q4	0.8	1.1	-0.7	-1.1	-0.2	0.5	0.8	2.0	0.0	0.8	0.8	1.6	1.0
Hours worked per person employed													
annual percentage changes													
2017	-0.4	-0.3	-0.4	-0.6	-0.3	-0.1	-0.5	-0.1	-0.5	-0.3	-0.2	-0.6	-0.5
2018	-0.1	0.1	-0.1	0.8	-0.2	0.3	-0.3	-0.3	-0.2	0.7	0.0	0.0	0.0
2019	-0.1	0.0	-0.3	0.3	-0.4	-0.2	-0.3	-1.0	0.2	0.0	-0.2	0.3	-0.1
2019 Q1	0.3	0.4	0.1	0.7	0.0	0.7	0.3	-0.7	0.4	-0.8	0.0	0.5	0.3
Q2	-0.3	-0.1	-0.6	-0.1	-0.6	0.0	-0.5	-1.4	0.2	-0.9	-0.1	0.2	-0.4
Q3	-0.3	-0.1	-0.5	-0.1	-0.4	-0.6	-0.5	-1.2	0.3	0.7	-0.5	0.3	-0.4
Q4	-0.3	-0.2	-0.2	0.5	-0.6	-1.0	-0.4	-1.0	-0.2	0.7	-0.3	0.2	-0.1

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	Under-employ-ment, % of labour force	Unemployment [1]											Job vacancy rate [3]
			Total		Long-term unemploy-ment, % of labour force [2]	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	% of total posts
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
% of total in 2016			100.0			81.8		18.3		52.2		47.8		
2017	161.860	4.1	14.585	9.0	4.4	11.946	8.1	2.640	18.6	7.556	8.7	7.029	9.4	1.9
2018	162.485	3.7	13.211	8.1	3.8	10.823	7.3	2.388	16.8	6.809	7.8	6.402	8.5	2.1
2019	163.297	3.5	12.268	7.5	3.3	10.030	6.7	2.238	15.6	6.291	7.2	5.977	7.9	2.3
2019 Q2	163.084	3.5	12.237	7.5	3.3	10.031	6.7	2.205	15.4	6.289	7.2	5.947	7.9	2.3
Q3	163.196	3.4	12.183	7.5	3.2	9.958	6.7	2.224	15.5	6.290	7.2	5.893	7.8	2.2
Q4	163.998	3.4	12.031	7.3	3.2	9.821	6.6	2.210	15.4	6.146	7.0	5.885	7.7	2.2
2020 Q1	.	.	12.038	7.3	.	9.804	6.5	2.234	15.5	6.173	7.0	5.865	7.7	.
2019 Oct.	-	-	12.169	7.4	-	9.935	6.6	2.234	15.5	6.246	7.1	5.924	7.8	-
Nov.	-	-	12.135	7.4	-	9.899	6.6	2.236	15.6	6.239	7.1	5.896	7.7	-
Dec.	-	-	12.098	7.3	-	9.871	6.6	2.227	15.4	6.267	7.1	5.831	7.6	-
2020 Jan.	-	-	11.999	7.3	-	9.795	6.5	2.203	15.3	6.168	7.0	5.831	7.6	-
Feb.	-	-	11.959	7.3	-	9.736	6.5	2.223	15.4	6.178	7.0	5.781	7.6	-
Mar.	-	-	12.156	7.4	-	9.881	6.6	2.275	15.8	6.174	7.0	5.982	7.8	-

Sources: Eurostat and ECB calculations.

1) Where annual and quarterly Labour Force Survey data have not yet been published, annual and quarterly data are derived as simple averages of the monthly data.

2) Not seasonally adjusted.

3) 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													
2017	3.0	3.2	3.4	3.9	1.4	1.2	3.1	7.9	2.5	1.6	3.5	0.8	5.6
2018	0.7	1.0	0.6	1.1	1.4	-1.5	2.0	2.7	1.6	1.3	1.9	0.5	0.9
2019	-1.4	-1.4	-2.6	-2.0	1.4	-1.9	2.2	-4.3	2.3	0.9	3.6	0.9	1.8
2019 Q2	-1.4	-1.6	-2.5	-2.9	1.8	-0.3	2.3	-3.6	2.1	1.2	3.0	0.3	-0.7
Q3	-1.8	-1.7	-3.4	-1.4	0.3	-1.9	1.4	-4.7	2.7	0.8	4.2	1.1	0.6
Q4	-2.1	-2.3	-3.9	-3.0	1.9	-2.5	0.5	-5.8	2.0	0.5	3.5	-0.4	12.5
2020 Q1	.	.	.	.	.	.	.	.	.	.	.	.	-27.3
2019 Oct.	-1.7	-1.7	-3.6	-2.7	3.0	-2.6	0.8	-4.7	1.8	0.4	2.9	0.6	9.8
Nov.	-1.4	-1.5	-2.9	-1.5	0.9	-1.6	1.4	-7.9	2.5	1.6	3.6	-1.3	9.9
Dec.	-3.4	-3.7	-5.6	-5.1	1.8	-3.3	-2.1	-4.6	1.9	-0.4	3.9	-0.5	17.9
2020 Jan.	-1.7	-1.1	-1.5	-1.7	0.8	-6.9	6.9	-1.4	2.2	1.0	2.9	0.2	-5.8
Feb.	-1.9	-1.9	-0.8	-3.6	0.4	-2.2	-0.9	-1.3	3.0	3.2	2.9	0.3	-6.3
Mar.	.	.	.	.	.	.	.	.	.	.	.	.	-60.2
month-on-month percentage changes (s.a.)													
2019 Oct.	-0.3	-0.4	0.5	-2.2	0.9	-0.9	-0.7	-0.3	0.0	0.5	-0.4	0.5	4.1
Nov.	-0.6	-0.6	-0.4	0.3	-1.4	0.8	0.8	-0.4	0.9	0.5	1.4	-1.2	2.3
Dec.	-1.8	-1.7	-2.0	-3.2	-0.3	-1.8	-1.6	-0.5	-0.9	-1.0	-1.1	-0.1	7.8
2020 Jan.	2.3	2.4	3.6	2.6	0.7	-0.5	4.0	2.4	0.7	0.8	0.6	2.0	-15.5
Feb.	-0.1	0.0	0.4	-1.5	0.3	0.7	-1.5	-1.2	0.9	2.4	0.2	-0.1	1.0
Mar.	.	.	.	.	.	.	.	.	.	.	.	.	-56.4

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
1999-15	98.7	-5.2	80.6	-11.7	-15.4	-8.6	7.3	-	51.2	52.5	53.0	52.8
2017	110.4	5.7	83.1	-5.4	-3.0	2.3	14.7	89.9	57.4	58.5	55.6	56.4
2018	111.5	6.7	83.7	-4.9	7.0	1.3	15.2	90.4	54.9	54.7	54.5	54.6
2019	103.1	-5.1	81.9	-7.1	6.4	-0.4	10.7	90.5	47.4	47.8	52.7	51.3
2019 Q2	103.8	-4.0	82.2	-7.0	7.2	-0.6	11.7	90.6	47.7	48.5	53.1	51.8
Q3	102.0	-7.1	81.4	-6.8	5.1	0.0	9.7	90.4	46.4	47.0	52.8	51.2
Q4	100.6	-9.2	80.9	-7.7	4.9	-0.1	9.8	90.2	46.4	46.7	52.3	50.7
2020 Q1	100.1	-8.1	75.3	-8.8	4.5	-3.0	6.6	88.0	47.2	45.1	43.9	44.2
2019 Nov.	100.7	-8.9	-	-7.2	3.9	-0.2	9.2	-	46.9	47.4	51.9	50.6
Dec.	100.9	-9.3	-	-8.1	5.7	0.7	11.3	-	46.3	46.1	52.8	50.9
2020 Jan.	102.6	-7.0	80.8	-8.1	5.8	-0.1	11.0	90.3	47.9	48.0	52.5	51.3
Feb.	103.4	-6.2	-	-6.6	5.4	-0.2	11.1	-	49.2	48.7	52.6	51.6
Mar.	94.2	-11.2	-	-11.6	2.3	-8.6	-2.3	-	44.5	38.5	26.4	29.7
Apr.	67.0	-30.4	69.7	-22.7	-12.8	-28.3	-35.0	85.6	33.6	18.4	11.7	13.5

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)	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) [1]		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
2016	12.3	94.0	2.0	2.0	5.5	3.4	3.0	35.1	7.4	80.1	4.3	5.5	2.6
2017	12.0	93.9	1.4	2.3	5.2	4.7	4.7	34.3	7.1	77.5	4.6	8.2	3.0
2018	12.3	93.6	1.8	2.2	7.0	2.4	4.5	34.1	6.2	77.1	2.4	5.4	1.6
2019 Q1	12.6	93.4	2.1	2.4	7.9	3.5	3.9	33.9	6.3	77.3	2.3	7.6	1.6
Q2	12.8	93.4	2.3	2.5	4.4	4.0	3.8	33.7	5.9	78.0	1.6	16.6	1.3
Q3	13.0	93.5	2.5	2.6	4.3	4.5	3.5	33.6	5.9	78.7	1.7	-1.2	1.4
Q4	13.1	93.7	1.1	2.6	3.8	5.4	3.5	33.4	5.9	77.4	2.2	-2.6	1.7

Sources: ECB and Eurostat.
1) Based on four-quarter cumulated sums of saving, debt and gross disposable income (adjusted for the change in pension entitlements).
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) Defined as consolidated loans and debt securities 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	Balance	Credit	Debit	Credit	Debit	Credit	Debit	Credit	Debit	Credit	Debit
	1	2	3	4	5	6	7	8	9	10	11	12	13
2019 Q1	1,067.3	980.7	86.5	600.2	522.0	238.1	213.3	200.4	176.3	28.5	69.1	11.4	15.6
Q2	1,066.0	1,001.7	64.3	592.5	521.0	245.4	234.5	201.4	183.4	26.7	62.9	9.3	24.7
Q3	1,088.7	993.9	94.9	604.1	519.4	251.3	221.8	205.1	184.0	28.2	68.6	9.8	7.8
Q4	1,090.8	1,009.3	81.6	609.3	519.7	252.7	247.6	199.9	179.6	28.9	62.4	16.5	18.7
2019 Sep.	363.4	327.4	36.0	202.0	174.4	83.8	68.8	68.4	61.8	9.1	22.3	2.7	2.8
Oct.	366.9	340.1	26.9	204.4	173.9	84.6	82.2	67.8	61.0	10.1	23.0	3.6	4.8
Nov.	363.3	335.5	27.8	201.5	172.6	84.3	82.6	68.2	60.3	9.4	20.1	3.7	5.0
Dec.	360.6	333.7	26.9	203.4	173.2	83.8	82.8	63.9	58.3	9.5	19.3	9.1	9.0
2020 Jan.	370.2	338.4	31.8	203.7	174.1	86.8	78.5	70.3	60.5	9.4	25.3	2.9	2.3
Feb.	366.0	325.9	40.2	206.6	173.4	84.1	79.1	65.6	55.7	9.7	17.7	4.6	2.4
12-month cumulated transactions													
2020 Feb.	4,339.0	3,999.8	339.2	2,419.2	2,084.7	999.5	932.7	807.4	723.3	112.9	259.1	46.3	62.2
12-month cumulated transactions as a percentage of GDP													
2020 Feb.	36.4	33.6	2.8	20.3	17.5	8.4	7.8	6.8	6.1	0.9	2.2	0.4	0.5

1) The capital account is not seasonally adjusted.

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

(seasonally adjusted, unless otherwise indicated)

	Total (n.s.a.)		Exports (f.o.b.)					Imports (c.i.f.)					
			Total				Memo item:	Total				Memo items:	
	Exports	Imports		Intermediate goods	Capital goods	Consumption goods	Manufacturing		Intermediate goods	Capital goods	Consumption goods	Manufacturing	Oil
	1	2	3	4	5	6	7	8	9	10	11	12	13
Values (EUR billions; annual percentage changes for columns 1 and 2)													
2019 Q1	3.7	5.4	586.1	283.3	121.1	173.0	493.6	533.3	306.4	86.8	133.3	383.4	64.0
Q2	2.1	2.5	581.8	275.7	120.2	175.6	486.6	531.1	302.2	85.7	134.7	381.6	65.6
Q3	3.2	0.6	584.7	279.5	117.9	177.4	488.9	530.3	297.7	87.8	137.1	387.2	60.2
Q4	2.1	-1.9	592.4	277.2	125.5	179.2	496.2	527.3	293.0	86.8	138.3	385.2	60.8
2019 Sep.	5.3	2.3	195.8	93.0	39.4	59.6	163.2	177.3	98.3	29.3	47.1	129.6	19.8
Oct.	4.5	-2.3	200.3	93.2	43.4	60.8	168.2	176.4	97.4	30.0	46.5	129.7	19.2
Nov.	-2.6	-4.0	194.8	91.5	40.6	59.1	163.8	176.1	98.1	28.6	46.4	128.9	20.2
Dec.	4.9	1.2	197.2	92.6	41.5	59.3	164.2	174.8	97.5	28.1	45.4	126.6	21.4
2020 Jan.	0.1	-0.5	196.8	93.8	39.4	60.1	164.6	178.6	100.9	29.0	46.2	129.0	22.1
Feb.	1.6	-0.9	200.3	.	.	.	166.1	174.5	.	.	.	126.1	.
Volume indices (2000 = 100; annual percentage changes for columns 1 and 2)													
2019 Q1	-0.3	1.7	108.0	111.5	107.5	105.3	108.1	110.1	110.1	109.6	112.3	111.7	105.0
Q2	-1.4	-0.2	106.4	108.2	105.9	105.3	106.2	109.2	107.5	109.3	113.4	111.5	97.3
Q3	1.0	1.7	106.7	109.6	103.4	106.0	106.2	109.7	108.3	111.2	113.0	111.8	96.7
Q4	0.0	-1.7	107.5	108.7	108.7	106.0	107.1	107.6	106.0	106.0	112.8	109.9	96.6
2019 Aug.	-4.2	-2.5	106.8	109.9	103.1	106.1	106.4	109.6	108.4	111.2	111.5	111.2	99.1
Sep.	3.3	3.9	107.1	109.5	103.5	106.5	106.2	109.4	107.1	110.3	115.4	111.4	95.7
Oct.	2.3	-0.9	109.5	109.9	113.0	108.7	109.3	108.5	106.1	111.9	113.6	111.5	93.2
Nov.	-4.3	-3.4	106.4	108.0	106.0	105.0	106.4	108.1	106.9	104.6	113.7	110.4	97.4
Dec.	2.3	-0.7	106.7	108.3	107.1	104.5	105.6	106.3	105.0	101.4	111.1	107.8	99.2
2020 Jan.	-2.7	-3.3	105.8	108.3	102.3	105.2	105.0	107.8	107.2	106.4	111.6	109.3	101.1

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)]						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 2019	100.0	100.0	70.9	55.5	44.5	100.0	14.5	4.5	26.4	10.1	44.5	87.0	13.0
2017	101.8	1.5	1.0	1.6	1.4	-	-	-	-	-	-	1.6	1.0
2018	103.6	1.8	1.0	2.0	1.5	-	-	-	-	-	-	1.7	2.1
2019	104.8	1.2	1.0	1.0	1.5	-	-	-	-	-	-	1.1	1.9
2019 Q2	105.3	1.4	1.1	1.3	1.5	0.6	0.5	-0.1	0.1	1.6	0.7	1.3	2.4
Q3	105.1	1.0	0.9	0.7	1.3	0.1	0.5	1.3	0.1	-1.5	0.3	0.9	1.6
Q4	105.3	1.0	1.2	0.4	1.7	0.3	0.4	0.3	0.1	0.2	0.4	1.0	1.2
2020 Q1	104.7	1.1	1.1	0.8	1.5	0.1	0.6	1.3	0.2	-1.3	0.2	1.2	0.8
2019 Nov.	105.1	1.0	1.3	0.3	1.9	0.1	0.3	0.5	0.1	0.0	0.1	0.9	1.2
Dec.	105.4	1.3	1.3	1.0	1.8	0.1	0.1	0.4	0.1	0.1	0.1	1.3	1.3
2020 Jan.	104.4	1.4	1.1	1.2	1.5	0.1	0.3	0.2	0.0	0.8	-0.1	1.5	0.8
Feb.	104.6	1.2	1.2	0.9	1.6	0.0	0.2	0.9	0.1	-1.6	0.1	1.3	0.8
Mar.	105.1	0.7	1.0	0.3	1.3	-0.3	0.3	0.0	0.0	-3.3	0.0	0.8	0.7
Apr. [3)]	105.5	0.4	0.9	.	1.2	-0.1	0.4	4.0	-0.2	-4.8	0.3	.	.

	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 2019	19.0	14.5	4.5	36.5	26.4	10.1	11.0	6.5	7.2	2.6	15.3	8.4
2017	1.8	1.5	2.4	1.5	0.3	4.9	1.3	1.2	2.1	-1.1	2.1	0.8
2018	2.2	2.1	2.3	1.9	0.3	6.4	1.2	1.2	1.5	-0.1	2.0	1.4
2019	1.8	1.9	1.4	0.5	0.3	1.1	1.4	1.3	2.0	-0.7	1.7	1.5
2019 Q2	1.5	1.8	0.6	1.2	0.3	3.6	1.3	1.3	2.1	-1.2	2.0	1.5
Q3	1.8	1.9	1.6	0.0	0.3	-0.7	1.5	1.5	2.2	-0.8	1.1	1.5
Q4	1.8	1.9	1.6	-0.3	0.4	-2.1	1.5	1.5	2.4	-0.2	2.0	1.5
2020 Q1	2.2	2.0	2.8	0.0	0.5	-1.0	1.6	1.4	1.7	0.0	1.6	1.5
2019 Nov.	1.9	2.0	1.8	-0.6	0.4	-3.2	1.5	1.5	2.4	-0.1	2.4	1.5
Dec.	2.0	2.0	2.1	0.4	0.5	0.2	1.6	1.5	2.5	-0.1	2.1	1.5
2020 Jan.	2.1	2.0	2.3	0.8	0.3	1.9	1.6	1.5	2.0	-0.2	1.5	1.5
Feb.	2.1	2.0	2.6	0.3	0.5	-0.3	1.5	1.4	2.0	0.0	1.8	1.5
Mar.	2.4	2.1	3.6	-0.9	0.5	-4.5	1.5	1.4	1.2	0.1	1.4	1.5
Apr. [3)]	3.6	2.4	7.7	.	0.3	-9.6	.	.	.	.	.	.

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 [2]	Residential property prices [3]	Experimental indicator of commercial property prices [3]
	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			
2017	100.8	3.0	3.0	2.1	3.2	0.9	1.9	2.9	0.2	5.6	2.0	4.3	4.8
2018	104.0	3.2	2.4	1.5	2.6	1.0	0.4	0.2	0.6	8.1	2.5	4.8	4.1
2019	104.7	0.7	0.6	0.7	0.1	1.5	1.0	1.1	0.8	-0.1	1.9	4.1	5.4
2019 Q1	105.4	3.0	1.3	1.1	1.3	1.5	0.4	-0.1	1.0	7.7	2.5	4.1	4.7
Q2	104.8	1.6	1.0	0.9	0.7	1.5	1.0	0.9	0.9	3.0	2.2	4.2	6.5
Q3	104.2	-0.6	0.0	0.5	-0.4	1.5	1.0	1.2	0.8	-4.3	1.1	3.9	5.4
Q4	104.4	-1.3	0.0	0.4	-1.2	1.4	1.7	2.3	0.7	-5.9	1.7	4.1	4.9
2019 Sep.	104.2	-1.1	-0.3	0.4	-0.7	1.5	1.2	1.4	0.8	-6.1	-	-	-
Oct.	104.2	-1.9	-0.7	0.4	-1.0	1.4	1.5	1.8	0.7	-7.7	-	-	-
Nov.	104.4	-1.4	-0.3	0.3	-1.4	1.4	1.7	2.2	0.7	-6.0	-	-	-
Dec.	104.5	-0.6	0.9	0.5	-1.1	1.5	2.0	2.9	0.7	-3.8	-	-	-
2020 Jan.	104.7	-0.7	1.2	0.6	-1.1	1.3	2.2	3.2	0.7	-4.1	-	-	-
Feb.	104.1	-1.3	0.3	0.5	-1.2	1.2	2.3	3.3	0.7	-6.5	-	-	-

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

1) Domestic sales only.

2) Input prices for residential buildings.

3) 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: 2015 = 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
2017	101.8	1.0	1.4	1.3	1.4	1.7	1.9	2.8	48.1	5.8	-3.5	16.6	6.7	-1.6	17.8
2018	103.1	1.3	1.7	1.4	1.8	2.0	1.4	2.3	60.4	-0.6	-5.8	4.3	-0.1	-5.3	5.7
2019	104.9	1.7	1.5	1.2	1.7	2.3	0.6	0.1	57.2	1.7	3.7	-0.1	2.6	7.5	-2.3
2019 Q2	104.7	1.7	1.7	1.6	1.8	2.1	1.0	0.9	61.0	-1.8	-0.7	-2.8	-0.1	4.7	-4.9
Q3	105.1	1.7	1.3	1.1	1.7	2.2	0.1	-1.1	55.7	1.8	3.7	0.2	1.7	6.5	-3.1
Q4	105.6	1.8	1.3	1.0	1.6	2.3	0.2	-0.8	56.5	3.7	8.7	-0.6	5.1	13.7	-3.6
2020 Q1	.	.	.	.	.	.	.	.	45.9	3.3	9.1	-1.7	2.7	9.0	-3.8
2019 Oct.	-	-	-	-	-	-	-	-	53.7	1.1	5.1	-2.4	1.9	9.4	-5.4
Nov.	-	-	-	-	-	-	-	-	56.8	3.8	9.9	-1.6	6.5	17.2	-4.2
Dec.	-	-	-	-	-	-	-	-	59.3	6.4	11.2	2.2	6.8	14.4	-1.1
2020 Jan.	-	-	-	-	-	-	-	-	57.3	7.2	11.3	3.5	6.9	12.9	0.7
Feb.	-	-	-	-	-	-	-	-	50.5	2.4	8.7	-3.0	2.2	9.2	-4.9
Mar.	-	-	-	-	-	-	-	-	29.7	0.4	7.2	-5.5	-0.9	5.0	-7.1

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
1999-15	4.3	-	-	-4.5	32.3	56.7	56.3	-	49.7
2017	9.3	5.2	7.1	2.8	12.9	64.6	56.3	55.1	51.6
2018	11.6	7.5	9.5	12.5	20.6	65.4	57.9	56.1	52.7
2019	4.3	7.2	9.0	7.4	18.3	48.8	57.1	50.4	52.4
2019 Q2	4.8	7.2	9.2	6.6	19.8	50.6	57.1	51.2	52.3
Q3	1.9	6.6	8.4	4.9	17.9	46.4	56.5	48.9	52.0
Q4	1.4	6.9	7.9	5.9	14.7	44.2	56.9	48.6	52.0
2020 Q1	2.0	6.6	7.4	4.9	13.3	45.6	54.7	48.0	49.7
2019 Nov.	0.8	6.4	7.3	6.1	14.0	43.9	56.8	48.3	52.1
Dec.	2.1	7.9	8.4	6.4	14.1	45.0	56.7	48.9	51.8
2020 Jan.	2.9	8.6	10.4	6.8	14.9	45.6	57.6	48.6	51.8
Feb.	3.5	7.4	9.1	5.9	14.3	47.1	56.8	48.1	52.1
Mar.	-0.3	3.9	2.8	1.9	10.6	44.2	49.7	47.2	45.3
Apr.	-7.9	-8.4	-8.1	-13.7	4.8	44.9	44.7	45.9	39.4

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: 2016 = 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 2018	100.0	100.0	75.3	24.7	69.0	31.0	
2017	101.8	1.8	1.7	1.8	1.8	1.7	1.5
2018	104.2	2.3	2.3	2.5	2.4	2.1	2.1
2019	106.9	2.6	2.6	2.5	2.5	2.7	2.2
2019 Q1	99.8	2.6	2.7	2.0	2.6	2.5	2.3
Q2	110.9	2.8	2.8	2.9	2.7	3.1	2.0
Q3	103.5	2.6	2.7	2.7	2.7	2.5	2.6
Q4	113.2	2.4	2.3	2.4	2.3	2.6	2.0

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: 2015 =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												
2017	106.2	0.7	-0.2	-0.6	0.8	0.4	0.0	-1.4	3.4	1.7	1.4	1.1
2018	108.1	1.8	0.1	1.7	1.0	1.7	1.6	-0.7	3.4	2.2	2.3	2.5
2019	110.3	2.0	0.6	3.5	1.3	1.7	1.2	-1.1	2.7	1.6	2.7	1.9
2019 Q1	109.4	2.3	1.6	3.6	1.1	2.0	1.7	-0.7	5.1	1.8	2.6	1.6
Q2	110.0	2.1	-0.1	3.2	1.7	2.0	1.5	-0.9	3.2	1.7	2.6	2.3
Q3	110.6	1.9	-0.7	4.0	1.1	1.4	1.6	-1.2	2.3	1.3	2.6	1.7
Q4	110.9	1.8	1.5	3.0	1.5	1.2	-0.2	-1.3	0.2	1.7	2.8	2.2
Compensation per employee												
2017	111.3	1.7	1.1	1.5	1.9	1.5	2.0	1.2	2.2	2.5	1.8	1.6
2018	113.8	2.2	1.8	1.9	1.9	2.4	2.6	1.6	3.2	2.7	2.0	2.6
2019	116.1	2.0	1.8	1.5	2.1	2.2	1.6	1.3	3.0	1.9	2.3	2.5
2019 Q1	115.4	2.3	1.5	1.9	2.4	2.7	2.0	1.4	4.0	1.9	2.3	2.5
Q2	115.9	2.1	1.8	1.1	2.2	2.3	1.4	1.8	3.2	2.4	2.2	3.1
Q3	116.7	2.1	1.2	2.0	2.0	2.3	1.8	1.1	3.2	1.9	2.3	2.1
Q4	116.8	1.7	2.8	0.8	1.6	1.6	1.3	1.1	1.8	1.5	2.6	2.2
Labour productivity per person employed												
2017	104.8	0.9	1.3	2.1	1.1	1.0	2.0	2.7	-1.1	0.7	0.4	0.5
2018	105.2	0.4	1.7	0.3	0.8	0.6	1.0	2.4	-0.2	0.5	-0.3	0.0
2019	105.3	0.0	1.2	-1.9	0.7	0.6	0.4	2.4	0.4	0.3	-0.3	0.5
2019 Q1	105.5	0.0	-0.2	-1.6	1.3	0.7	0.3	2.1	-1.0	0.1	-0.3	0.9
Q2	105.3	0.0	1.9	-2.0	0.6	0.3	-0.1	2.7	-0.1	0.6	-0.4	0.8
Q3	105.5	0.2	1.8	-1.9	0.9	0.9	0.2	2.3	0.9	0.7	-0.3	0.4
Q4	105.3	-0.1	1.2	-2.2	0.1	0.5	1.5	2.4	1.6	-0.2	-0.3	0.0
Compensation per hour worked												
2017	113.3	2.0	1.3	1.8	1.9	1.8	2.0	1.8	2.1	2.3	2.4	2.1
2018	115.8	2.1	1.3	2.1	1.4	2.4	2.7	1.9	2.4	2.7	1.9	2.2
2019	118.1	2.1	1.4	1.9	2.3	2.3	2.6	0.9	2.8	2.1	1.9	2.7
2019 Q1	116.7	1.9	-0.4	2.0	1.7	2.2	2.6	0.9	4.2	1.9	1.7	2.2
Q2	117.4	2.2	2.4	1.8	2.4	2.4	2.5	1.4	3.4	2.5	1.9	3.6
Q3	118.2	2.3	1.4	2.5	2.6	2.6	2.8	0.7	2.3	2.3	1.8	2.5
Q4	118.5	1.9	2.1	1.4	2.7	1.8	2.6	1.1	1.4	1.9	2.2	2.3
Hourly labour productivity												
2017	107.2	1.4	1.8	2.5	1.2	1.6	2.1	3.2	-0.9	0.9	1.0	1.0
2018	107.7	0.5	0.8	0.5	0.6	0.9	1.3	2.6	-0.8	0.5	-0.3	0.0
2019	107.8	0.2	0.9	-1.5	0.9	0.8	1.5	2.2	0.4	0.5	-0.7	0.7
2019 Q1	107.4	-0.3	-0.9	-1.6	0.6	0.4	1.1	1.7	-0.2	0.1	-0.8	0.6
Q2	107.5	0.3	2.0	-1.4	0.6	0.8	1.2	2.5	0.8	0.8	-0.6	1.2
Q3	107.7	0.5	2.0	-1.5	1.5	1.4	1.4	2.0	0.2	1.1	-0.7	0.8
Q4	107.6	0.2	0.7	-1.6	1.2	0.9	2.5	2.6	0.9	0.1	-0.5	0.1

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												
2017	1,112.0	6,638.1	7,750.1	1,196.6	2,261.8	3,458.3	11,208.5	74.4	512.0	72.6	659.1	11,867.5
2018	1,163.3	7,114.7	8,278.1	1,124.9	2,299.0	3,423.9	11,702.0	74.3	524.0	71.5	669.8	12,371.8
2019	1,219.6	7,724.3	8,943.9	1,069.4	2,365.0	3,434.3	12,378.3	78.5	531.6	8.9	619.0	12,997.3
2019 Q2	1,189.0	7,415.4	8,604.4	1,111.1	2,338.5	3,449.6	12,054.0	74.5	523.9	37.6	636.0	12,690.0
Q3	1,204.1	7,605.6	8,809.6	1,110.0	2,354.8	3,464.7	12,274.4	74.5	546.3	19.1	640.0	12,914.4
Q4	1,219.6	7,724.3	8,943.9	1,069.4	2,365.0	3,434.3	12,378.3	78.5	531.6	8.9	619.0	12,997.3
2020 Q1 [p]	1,261.7	8,073.5	9,335.2	1,077.5	2,361.8	3,439.3	12,774.5	109.9	528.4	60.2	698.5	13,473.0
2019 Oct.	1,209.5	7,672.3	8,881.7	1,093.9	2,359.2	3,453.1	12,334.8	79.6	529.2	27.8	636.6	12,971.4
Nov.	1,216.9	7,715.9	8,932.7	1,081.3	2,359.5	3,440.8	12,373.5	73.4	530.6	26.0	630.0	13,003.5
Dec.	1,219.6	7,724.3	8,943.9	1,069.4	2,365.0	3,434.3	12,378.3	78.5	531.6	8.9	619.0	12,997.3
2020 Jan.	1,228.3	7,743.9	8,972.2	1,062.4	2,363.6	3,426.0	12,398.2	75.8	547.8	25.0	648.5	13,046.7
Feb.	1,236.2	7,826.3	9,062.5	1,064.3	2,361.1	3,425.4	12,488.0	84.9	550.8	26.8	662.5	13,150.5
Mar. [p]	1,261.7	8,073.5	9,335.2	1,077.5	2,361.8	3,439.3	12,774.5	109.9	528.4	60.2	698.5	13,473.0
Transactions												
2017	36.0	592.6	628.6	-109.5	34.5	-74.9	553.7	6.5	-10.8	-18.5	-22.7	530.9
2018	50.3	465.1	515.4	-74.0	45.2	-28.9	486.6	-0.9	12.3	-3.3	8.1	494.7
2019	56.3	603.2	659.5	-60.2	63.6	3.4	662.9	4.1	-1.8	-56.6	-54.3	608.5
2019 Q2	9.7	143.1	152.8	-4.4	20.3	15.8	168.7	0.4	3.2	-2.4	1.3	169.9
Q3	15.1	181.2	196.3	-4.6	14.8	10.2	206.5	-0.6	21.1	-18.1	2.5	209.0
Q4	15.6	122.9	138.5	-38.2	8.9	-29.3	109.2	4.5	-16.0	-8.5	-20.0	89.2
2020 Q1 [p]	42.1	344.6	386.7	6.1	-2.1	4.0	390.7	31.0	-3.2	49.3	77.1	467.8
2019 Oct.	5.4	69.6	75.0	-14.2	3.1	-11.1	63.9	5.5	-17.2	9.9	-1.8	62.1
Nov.	7.4	40.3	47.7	-14.0	0.2	-13.9	33.9	-6.5	1.4	-1.4	-6.5	27.4
Dec.	2.8	13.0	15.8	-10.0	5.7	-4.3	11.5	5.5	-0.2	-17.0	-11.8	-0.3
2020 Jan.	8.7	15.5	24.2	-8.8	-1.4	-10.2	13.9	-3.0	16.1	16.4	29.5	43.5
Feb.	7.9	81.3	89.2	1.5	-2.5	-1.1	88.1	9.1	3.0	1.3	13.3	101.5
Mar. [p]	25.5	247.8	273.4	13.5	1.8	15.2	288.6	25.0	-22.3	31.5	34.2	322.8
Growth rates												
2017	3.3	9.8	8.8	-8.3	1.6	-2.1	5.2	9.5	-2.1	-21.1	-3.3	4.7
2018	4.5	7.0	6.6	-6.2	2.0	-0.8	4.3	-1.3	2.4	-4.7	1.2	4.2
2019	4.8	8.5	8.0	-5.3	2.8	0.1	5.7	5.4	-0.4	-85.0	-8.1	4.9
2019 Q2	4.7	7.7	7.2	-6.1	3.0	-0.1	5.0	1.1	1.1	-38.3	-2.8	4.6
Q3	4.7	8.5	7.9	-2.6	3.0	1.1	5.9	3.0	8.7	-65.4	1.1	5.7
Q4	4.8	8.5	8.0	-5.3	2.8	0.1	5.7	5.4	-0.4	-85.0	-8.1	4.9
2020 Q1 [p]	7.0	10.9	10.3	-3.7	1.8	0.0	7.4	47.4	1.0	61.2	9.6	7.5
2019 Oct.	4.8	9.0	8.4	-4.3	2.9	0.5	6.1	10.1	3.5	-47.5	-0.6	5.7
Nov.	5.0	8.8	8.3	-4.7	2.7	0.3	5.9	-1.1	4.1	-47.4	-1.1	5.6
Dec.	4.8	8.5	8.0	-5.3	2.8	0.1	5.7	5.4	-0.4	-85.0	-8.1	4.9
2020 Jan.	5.2	8.3	7.9	-5.8	2.5	-0.2	5.5	0.7	5.0	-51.5	-0.8	5.2
Feb.	5.4	8.6	8.1	-5.7	2.1	-0.4	5.6	17.7	5.9	-45.8	2.5	5.5
Mar. [p]	7.0	10.9	10.3	-3.7	1.8	0.0	7.4	47.4	1.0	61.2	9.6	7.5

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													
2017	2,240.3	1,797.4	285.0	149.1	8.8	6,317.6	3,702.8	562.1	2,051.9	0.8	991.1	206.6	415.3
2018	2,331.4	1,898.7	277.3	147.8	7.6	6,644.9	4,035.9	517.6	2,090.1	1.4	998.2	202.9	435.5
2019	2,476.2	2,062.7	256.9	150.1	6.5	7,041.8	4,395.5	492.5	2,152.9	0.9	1,036.9	214.4	467.8
2019 Q2	2,406.1	1,983.7	265.3	150.0	7.1	6,846.9	4,207.9	509.7	2,127.6	1.7	1,009.5	216.6	460.4
Q3	2,450.9	2,031.3	262.2	151.4	5.9	6,964.9	4,318.1	504.5	2,141.3	1.0	1,042.3	221.3	465.5
Q4	2,476.2	2,062.7	256.9	150.1	6.5	7,041.8	4,395.5	492.5	2,152.9	0.9	1,036.9	214.4	467.8
2020 Q1 [(p)]	2,607.5	2,189.1	262.7	148.0	7.7	7,160.4	4,529.5	472.1	2,158.2	0.6	1,152.0	225.2	477.6
2019 Oct.	2,472.8	2,053.0	260.0	151.9	7.9	6,994.8	4,349.4	500.5	2,143.3	1.7	1,048.2	222.7	466.4
Nov.	2,482.0	2,073.5	251.5	151.4	5.6	7,026.7	4,382.6	497.2	2,145.2	1.7	1,022.2	226.8	472.4
Dec.	2,476.2	2,062.7	256.9	150.1	6.5	7,041.8	4,395.5	492.5	2,152.9	0.9	1,036.9	214.4	467.8
2020 Jan.	2,475.0	2,063.7	256.5	150.7	4.1	7,062.0	4,421.4	487.1	2,152.5	0.9	1,023.9	217.7	467.1
Feb.	2,506.7	2,097.6	253.0	150.6	5.4	7,087.2	4,452.3	482.4	2,151.7	0.8	1,051.8	215.2	475.7
Mar. [(p)]	2,607.5	2,189.1	262.7	148.0	7.7	7,160.4	4,529.5	472.1	2,158.2	0.6	1,152.0	225.2	477.6
Transactions													
2017	180.7	182.4	-1.9	-0.8	0.9	254.7	304.7	-82.1	33.6	-1.5	54.9	7.2	26.7
2018	93.1	105.3	-9.7	-1.1	-1.4	326.5	324.8	-45.0	46.1	0.5	0.5	-3.9	19.1
2019	146.0	163.5	-18.8	1.8	-0.5	395.2	358.3	-25.7	63.2	-0.5	29.2	10.2	30.1
2019 Q2	29.5	30.6	-4.3	2.2	1.1	94.1	82.1	-5.1	16.7	0.3	31.8	4.0	-0.1
Q3	40.7	43.9	-2.9	1.0	-1.3	116.9	109.6	-6.0	13.9	-0.6	25.1	3.8	4.4
Q4	28.8	34.6	-4.3	-2.2	0.7	77.5	76.9	-11.5	12.3	-0.2	-3.1	-6.9	1.8
2020 Q1 [(p)]	128.6	124.5	5.0	-2.1	1.2	118.4	133.2	-20.9	6.3	-0.3	112.4	10.5	9.8
2019 Oct.	24.2	24.0	-1.5	-0.4	2.1	30.1	30.4	-3.7	2.7	0.7	7.9	1.4	0.4
Nov.	7.4	19.3	-9.1	-0.5	-2.4	31.1	33.0	-3.6	1.7	0.0	-28.4	3.8	6.0
Dec.	-2.8	-8.8	6.3	-1.4	1.0	16.3	13.5	-4.2	7.9	-0.8	17.4	-12.1	-4.6
2020 Jan.	-3.5	-0.6	-1.1	0.6	-2.4	19.2	25.4	-5.8	-0.4	0.0	-15.6	2.9	-0.7
Feb.	31.1	33.5	-3.6	-0.1	1.3	24.9	30.7	-4.8	-0.9	0.0	27.2	-2.5	8.6
Mar. [(p)]	101.0	91.6	9.7	-2.6	2.3	74.3	77.2	-10.3	7.6	-0.2	100.8	10.0	2.0
Growth rates													
2017	8.6	11.2	-0.7	-0.5	11.5	4.2	9.0	-12.7	1.7	-65.1	5.8	3.6	6.9
2018	4.2	5.9	-3.5	-0.7	-16.5	5.2	8.8	-8.0	2.3	67.7	0.0	-1.9	4.6
2019	6.3	8.6	-6.8	1.2	-6.8	5.9	8.9	-5.0	3.0	-36.8	2.9	5.0	6.9
2019 Q2	5.8	7.6	-4.6	2.5	12.2	5.8	8.6	-4.9	3.1	72.0	-0.9	-1.3	7.6
Q3	6.4	8.0	-2.6	2.8	-11.8	6.3	9.3	-4.1	3.1	-10.1	3.6	4.3	6.6
Q4	6.3	8.6	-6.8	1.2	-6.8	5.9	8.9	-5.0	3.0	-36.8	2.9	5.0	6.9
2020 Q1 [(p)]	9.6	11.9	-2.4	-0.7	24.8	6.0	9.7	-8.4	2.3	-55.9	16.9	5.3	3.4
2019 Oct.	7.2	9.1	-3.8	2.4	31.9	6.2	9.2	-4.1	3.1	30.9	4.2	6.5	5.9
Nov.	7.0	9.8	-8.4	2.1	-24.6	6.3	9.4	-4.2	2.9	30.5	1.3	8.5	6.0
Dec.	6.3	8.6	-6.8	1.2	-6.8	5.9	8.9	-5.0	3.0	-36.8	2.9	5.0	6.9
2020 Jan.	6.1	8.2	-5.4	1.3	-41.1	5.7	8.7	-6.1	2.7	-43.4	3.3	4.9	5.1
Feb.	6.5	9.0	-7.9	1.4	-13.8	5.4	8.6	-6.8	2.4	-46.5	7.1	3.0	4.6
Mar. [(p)]	9.6	11.9	-2.4	-0.7	24.8	6.0	9.7	-8.4	2.3	-55.9	16.9	5.3	3.4

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												
2017	4,617.2	1,032.3	3,571.0	13,114.0	10,870.5	11,165.8	4,323.4	5,600.3	838.0	108.7	1,440.4	803.2
2018	4,676.7	1,006.2	3,659.0	13,415.9	11,122.4	11,482.8	4,402.3	5,742.1	851.2	126.8	1,517.9	775.6
2019	4,652.6	984.5	3,656.3	13,865.6	11,452.1	11,838.5	4,472.5	5,930.9	896.1	152.6	1,560.6	852.9
2019 Q2	4,640.2	1,000.7	3,627.8	13,640.4	11,290.6	11,667.0	4,462.4	5,825.8	870.3	132.1	1,546.7	803.2
Q3	4,696.5	999.8	3,685.1	13,776.5	11,394.4	11,764.1	4,488.5	5,876.3	883.4	146.2	1,570.7	811.5
Q4	4,652.6	984.5	3,656.3	13,865.6	11,452.1	11,838.5	4,472.5	5,930.9	896.1	152.6	1,560.6	852.9
2020 Q1 [(p)]	4,772.8	1,006.8	3,754.3	14,043.1	11,685.0	12,059.4	4,598.3	5,967.1	958.2	161.5	1,558.4	799.7
2019 Oct.	4,665.0	1,001.8	3,651.5	13,818.4	11,423.4	11,788.2	4,502.5	5,895.0	887.1	138.9	1,561.3	833.7
Nov.	4,639.1	1,000.9	3,626.4	13,854.1	11,439.1	11,807.9	4,492.2	5,912.9	888.2	145.8	1,570.8	844.3
Dec.	4,652.6	984.5	3,656.3	13,865.6	11,452.1	11,838.5	4,472.5	5,930.9	896.1	152.6	1,560.6	852.9
2020 Jan.	4,670.3	994.3	3,664.3	13,912.7	11,511.7	11,874.7	4,483.9	5,961.2	913.1	153.5	1,547.2	853.8
Feb.	4,672.0	993.0	3,667.2	13,944.6	11,533.4	11,899.4	4,488.5	5,983.4	911.4	150.1	1,565.8	845.4
Mar. [(p)]	4,772.8	1,006.8	3,754.3	14,043.1	11,685.0	12,059.4	4,598.3	5,967.1	958.2	161.5	1,558.4	799.7
Transactions												
2017	287.5	-43.7	330.6	363.2	274.2	316.4	84.9	173.2	19.7	-3.5	63.6	25.4
2018	90.3	-28.4	118.7	374.8	307.3	382.1	123.6	166.3	-0.5	17.8	88.1	-20.6
2019	-88.3	-23.5	-65.2	453.3	378.9	426.3	115.0	200.2	42.5	21.2	30.5	43.8
2019 Q2	-49.5	-1.6	-48.2	123.8	105.6	126.5	51.7	38.8	16.6	-1.5	17.4	0.8
Q3	-2.6	-0.9	-1.7	129.6	102.3	104.5	27.2	52.0	9.2	13.9	20.7	6.6
Q4	-5.2	-15.6	10.2	90.5	78.8	104.9	2.8	60.4	9.1	6.5	-7.8	19.5
2020 Q1 [(p)]	132.0	21.7	110.3	224.7	244.1	236.3	131.7	42.4	61.3	8.8	15.0	-34.4
2019 Oct.	-17.5	2.4	-19.9	33.8	37.0	35.4	18.2	20.5	5.5	-7.2	-8.6	5.4
Nov.	-9.6	-0.9	-8.9	33.8	15.6	21.9	-4.0	18.6	-5.9	6.9	9.2	9.1
Dec.	21.8	-17.1	38.9	22.9	26.3	47.6	-11.4	21.4	9.5	6.9	-8.4	5.0
2020 Jan.	-9.1	9.6	-18.7	44.7	57.7	35.2	10.5	30.6	15.7	0.8	-14.0	1.1
Feb.	6.7	-1.5	8.2	42.8	23.1	28.3	6.0	22.9	-2.4	-3.4	20.5	-0.8
Mar. [(p)]	134.4	13.6	120.8	137.2	163.3	172.8	115.1	-11.2	48.0	11.4	8.5	-34.6
Growth rates												
2017	6.6	-4.1	10.2	2.8	2.6	2.9	2.0	3.2	2.4	-3.2	4.6	3.2
2018	2.0	-2.8	3.4	2.9	2.8	3.4	2.9	3.0	-0.1	16.4	6.1	-2.6
2019	-1.9	-2.3	-1.8	3.4	3.4	3.7	2.6	3.5	5.0	16.2	2.0	5.6
2019 Q2	-0.2	-2.0	0.3	3.0	3.2	3.5	3.3	3.2	1.7	5.9	3.1	1.3
Q3	-1.1	-0.5	-1.3	3.2	3.2	3.6	2.9	3.2	3.5	14.4	3.3	2.6
Q4	-1.9	-2.3	-1.8	3.4	3.4	3.7	2.6	3.5	5.0	16.2	2.0	5.6
2020 Q1 [(p)]	1.6	0.4	1.9	4.2	4.7	5.0	4.8	3.3	11.2	20.7	3.0	-0.9
2019 Oct.	-1.4	-0.1	-1.7	3.2	3.3	3.7	3.1	3.3	3.8	11.0	2.1	3.4
Nov.	-1.4	-0.3	-1.7	3.2	3.2	3.6	2.6	3.3	3.6	16.2	2.9	4.2
Dec.	-1.9	-2.3	-1.8	3.4	3.4	3.7	2.6	3.5	5.0	16.2	2.0	5.6
2020 Jan.	-1.9	-1.3	-2.1	3.4	3.5	3.7	2.6	3.7	4.9	16.7	1.1	5.7
Feb.	-2.0	-1.0	-2.2	3.4	3.5	3.7	2.4	3.9	5.3	14.8	2.0	4.1
Mar. [(p)]	1.6	0.4	1.9	4.2	4.7	5.0	4.8	3.3	11.2	20.7	3.0	-0.9

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										
2017	4,323.4	4,358.7	986.2	821.2	2,516.1	5,600.3	5,867.4	654.8	4,216.4	729.0
2018	4,402.3	4,487.6	993.0	843.7	2,565.6	5,742.1	6,025.2	682.6	4,356.8	702.7
2019	4,472.5	4,575.5	970.7	877.0	2,624.8	5,930.9	6,224.3	719.8	4,524.2	686.9
2019 Q2	4,462.4	4,554.2	977.6	867.2	2,617.6	5,825.8	6,115.2	703.6	4,426.6	695.6
Q3	4,488.5	4,581.9	982.0	873.5	2,633.0	5,876.3	6,165.7	711.2	4,473.5	691.6
Q4	4,472.5	4,575.5	970.7	877.0	2,624.8	5,930.9	6,224.3	719.8	4,524.2	686.9
2020 Q1 [(p)]	4,598.3	4,699.9	1,000.8	914.6	2,682.9	5,967.1	6,254.1	715.6	4,565.1	686.4
2019 Oct.	4,502.5	4,592.9	983.3	878.1	2,641.2	5,895.0	6,182.7	713.4	4,492.7	688.9
Nov.	4,492.2	4,588.1	972.4	883.1	2,636.7	5,912.9	6,201.6	716.6	4,506.2	690.2
Dec.	4,472.5	4,575.5	970.7	877.0	2,624.8	5,930.9	6,224.3	719.8	4,524.2	686.9
2020 Jan.	4,483.9	4,582.0	959.8	881.2	2,642.9	5,961.2	6,243.5	724.3	4,549.6	687.3
Feb.	4,488.5	4,585.8	957.2	879.7	2,651.6	5,983.4	6,264.7	728.4	4,567.3	687.8
Mar. [(p)]	4,598.3	4,699.9	1,000.8	914.6	2,682.9	5,967.1	6,254.1	715.6	4,565.1	686.4
Transactions										
2017	84.9	134.8	0.6	39.1	45.2	173.2	165.6	45.0	134.0	-5.9
2018	123.6	175.7	18.6	32.7	72.3	166.3	188.6	41.3	134.3	-9.3
2019	115.0	144.7	-11.7	43.1	83.6	200.2	217.4	40.9	168.7	-9.4
2019 Q2	51.7	55.7	1.3	19.3	31.1	38.8	49.9	11.5	28.7	-1.4
Q3	27.2	34.0	3.6	6.3	17.3	52.0	54.9	8.4	46.5	-2.9
Q4	2.8	21.7	-5.2	7.6	0.5	60.4	63.9	9.6	53.8	-2.9
2020 Q1 [(p)]	131.7	131.1	27.2	42.2	62.2	42.4	38.0	-2.8	45.2	0.0
2019 Oct.	18.2	16.7	2.9	5.4	10.0	20.5	20.4	2.4	20.2	-2.2
Nov.	-4.0	3.0	-10.2	6.4	-0.2	18.6	20.2	3.8	13.5	1.2
Dec.	-11.4	2.0	2.1	-4.2	-9.3	21.4	23.3	3.3	20.1	-2.0
2020 Jan.	10.5	6.3	-11.5	3.2	18.9	30.6	19.7	4.5	24.9	1.2
Feb.	6.0	7.1	-7.7	3.8	9.9	22.9	22.3	4.4	17.5	1.0
Mar. [(p)]	115.1	117.7	46.5	35.2	33.5	-11.2	-4.0	-11.8	2.7	-2.1
Growth rates										
2017	2.0	3.2	0.1	5.0	1.8	3.2	2.9	7.3	3.3	-0.8
2018	2.9	4.1	1.9	4.0	2.9	3.0	3.2	6.4	3.2	-1.3
2019	2.6	3.2	-1.2	5.1	3.3	3.5	3.6	6.0	3.9	-1.3
2019 Q2	3.3	3.9	0.2	5.6	3.8	3.2	3.3	6.5	3.4	-1.2
Q3	2.9	3.6	-0.8	5.1	3.6	3.2	3.4	6.0	3.5	-1.6
Q4	2.6	3.2	-1.2	5.1	3.3	3.5	3.6	6.0	3.9	-1.3
2020 Q1 [(p)]	4.8	5.4	2.7	8.9	4.3	3.3	3.4	3.9	4.0	-1.0
2019 Oct.	3.1	3.8	0.5	4.9	3.5	3.3	3.4	5.8	3.7	-1.8
Nov.	2.6	3.4	-1.0	4.7	3.3	3.3	3.5	5.8	3.7	-1.5
Dec.	2.6	3.2	-1.2	5.1	3.3	3.5	3.6	6.0	3.9	-1.3
2020 Jan.	2.6	3.2	-1.3	5.1	3.3	3.7	3.7	6.1	4.1	-1.2
Feb.	2.4	3.0	-2.1	4.9	3.2	3.9	3.7	6.2	4.3	-1.0
Mar. [(p)]	4.8	5.4	2.7	8.9	4.3	3.3	3.4	3.9	4.0	-1.0

Source: ECB.

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

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

3) Including non-profit institutions serving households.

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

5 Money and credit

5.5 Counterparts to M3 other than credit to euro area residents [1)]

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

	MFI liabilities						MFI assets			
	Central government holdings [2)]	Longer-term financial liabilities vis-à-vis other euro area residents					Net external assets	Other		
		Total	Deposits with an agreed maturity of over 2 years	Deposits redeemable at notice of over 3 months	Debt securities with a maturity of over 2 years	Capital and reserves		Total	Repos with central counter-parties [3)]	Reverse repos to central counter-parties [3)]
	1	2	3	4	5	6	7	8	9	10
Outstanding amounts										
2017	342.7	6,771.1	1,967.5	59.8	2,017.5	2,726.2	933.7	316.3	143.5	92.5
2018	379.3	6,818.7	1,940.7	56.1	2,099.1	2,722.8	1,033.7	443.5	187.0	194.9
2019	350.3	7,061.1	1,944.2	51.3	2,156.1	2,909.6	1,461.3	429.2	178.9	187.2
2019 Q2	373.7	6,985.0	1,956.9	57.5	2,135.4	2,835.2	1,318.5	449.5	191.5	207.8
Q3	388.0	7,101.1	1,948.1	57.2	2,162.2	2,933.6	1,484.8	445.7	184.2	198.1
Q4	350.3	7,061.1	1,944.2	51.3	2,156.1	2,909.6	1,461.3	429.2	178.9	187.2
2020 Q1 [(p)]	413.6	7,041.4	1,935.1	47.2	2,121.0	2,938.0	1,572.4	539.6	183.6	196.1
2019 Oct.	380.5	7,076.7	1,949.4	53.1	2,151.3	2,922.8	1,509.5	435.7	221.4	236.2
Nov.	369.1	7,078.5	1,951.8	52.6	2,162.6	2,911.5	1,491.4	466.4	211.8	224.8
Dec.	350.3	7,061.1	1,944.2	51.3	2,156.1	2,909.6	1,461.3	429.2	178.9	187.2
2020 Jan.	372.2	7,114.6	1,946.7	50.0	2,165.8	2,952.1	1,542.6	407.9	171.1	182.3
Feb.	417.2	7,129.3	1,940.3	49.4	2,162.5	2,977.1	1,613.2	467.0	177.9	191.2
Mar. [(p)]	413.6	7,041.4	1,935.1	47.2	2,121.0	2,938.0	1,572.4	539.6	183.6	196.1
Transactions										
2017	39.0	-73.4	-83.5	-6.6	-71.1	87.8	-96.1	-58.2	-61.2	-28.5
2018	40.5	51.2	-37.8	-4.9	16.0	77.9	89.0	32.3	16.2	23.6
2019	-28.2	107.0	-6.1	-3.0	27.5	88.6	311.7	10.7	-2.7	-2.5
2019 Q2	3.8	46.0	22.0	1.6	-0.6	22.9	99.9	45.6	-6.9	-4.5
Q3	14.6	12.7	-14.6	-1.0	4.8	23.6	93.5	15.8	6.9	7.4
Q4	-37.5	4.4	-2.2	-3.3	-14.3	24.2	0.6	-29.8	-5.3	-10.9
2020 Q1 [(p)]	63.5	-41.1	-9.2	-2.9	-46.1	17.0	66.2	67.4	4.6	9.0
2019 Oct.	-7.3	-8.5	3.0	-1.5	-19.0	9.0	47.3	-17.3	37.3	38.1
Nov.	-11.3	17.4	1.2	-0.6	1.7	15.1	-16.8	26.1	-9.7	-11.3
Dec.	-18.9	-4.6	-6.4	-1.3	3.0	0.1	-29.9	-38.6	-32.8	-37.7
2020 Jan.	22.1	-7.2	-2.4	-1.3	2.5	-6.0	41.6	-18.8	-7.8	-4.9
Feb.	45.0	6.1	-6.7	-0.6	-4.9	18.3	53.3	49.7	6.8	9.0
Mar. [(p)]	-3.6	-39.9	0.0	-1.0	-43.7	4.7	-28.7	36.5	5.7	4.9
Growth rates										
2017	12.6	-1.1	-4.0	-9.6	-3.4	3.4	-	-	-29.8	-23.5
2018	11.8	0.8	-1.9	-8.1	0.8	2.9	-	-	8.1	7.7
2019	-7.4	1.6	-0.3	-5.4	1.3	3.2	-	-	-1.5	-1.5
2019 Q2	12.6	2.2	-0.4	-1.3	3.1	3.4	-	-	5.1	6.7
Q3	-3.2	1.8	-0.3	-0.7	2.2	3.1	-	-	6.9	11.0
Q4	-7.4	1.6	-0.3	-5.4	1.3	3.2	-	-	-1.5	-1.5
2020 Q1 [(p)]	12.0	0.3	-0.2	-10.3	-2.6	3.1	-	-	-0.3	0.4
2019 Oct.	-2.9	1.5	0.0	-2.8	1.1	3.0	-	-	36.4	38.9
Nov.	-4.4	1.8	0.2	-2.6	1.2	3.3	-	-	11.1	12.8
Dec.	-7.4	1.6	-0.3	-5.4	1.3	3.2	-	-	-1.5	-1.5
2020 Jan.	-1.3	1.2	-0.2	-7.2	0.6	2.7	-	-	-11.5	-10.3
Feb.	4.3	0.9	-0.3	-8.4	-0.7	3.2	-	-	-7.6	-6.9
Mar. [(p)]	12.0	0.3	-0.2	-10.3	-2.6	3.1	-	-	-0.3	0.4

Source: ECB.

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

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

3) Not adjusted for seasonal effects.

6 Fiscal developments

6.1 Deficit/surplus

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

	Deficit (-)/surplus (+)					Memo item: Primary deficit (-)/ surplus (+)
	Total	Central government	State government	Local government	Social security funds	
	1	2	3	4	5	6
2016	-1.5	-1.7	0.0	0.2	0.1	0.7
2017	-1.0	-1.4	0.1	0.2	0.1	1.0
2018	-0.5	-1.0	0.1	0.2	0.3	1.4
2019	-0.6	-1.0	0.1	0.0	0.2	1.0
2019 Q1	-0.6	.	.	.	.	1.2
Q2	-0.7	.	.	.	.	1.1
Q3	-0.8	.	.	.	.	0.9
Q4	-0.6	.	.	.	.	1.0

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
2016	46.2	45.7	12.6	13.0	15.3	0.5	47.7	44.1	10.0	5.3	2.1	22.7	3.6
2017	46.2	45.8	12.8	13.0	15.2	0.4	47.2	43.4	9.9	5.3	1.9	22.5	3.8
2018	46.5	46.0	13.0	13.0	15.2	0.5	47.0	43.3	9.9	5.3	1.8	22.3	3.7
2019	46.5	46.0	13.0	13.1	15.1	0.5	47.1	43.4	9.9	5.3	1.6	22.5	3.7
2019 Q1	46.5	46.0	12.9	13.1	15.2	0.5	47.0	43.3	9.9	5.3	1.8	22.4	3.7
Q2	46.5	46.0	12.9	13.1	15.1	0.5	47.2	43.4	9.9	5.3	1.8	22.4	3.7
Q3	46.4	45.9	12.9	13.1	15.1	0.5	47.2	43.5	9.9	5.3	1.7	22.5	3.8
Q4	46.5	46.0	13.0	13.1	15.1	0.5	47.1	43.4	9.9	5.3	1.6	22.6	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 [1)]	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
2016	90.0	3.3	15.7	71.0	47.5	30.9	42.5	9.4	80.7	17.9	29.8	42.3	87.9	2.1
2017	87.8	3.2	14.6	70.0	48.3	32.2	39.5	8.6	79.1	16.4	29.0	42.3	85.9	1.8
2018	85.8	3.1	13.8	68.9	48.1	32.5	37.7	8.0	77.8	16.0	28.4	41.3	84.4	1.5
2019	84.1	3.0	13.1	68.0	45.5	30.7	38.6	7.7	76.4	15.7	28.0	40.4	82.8	1.3
2019 Q1	86.5	3.1	13.6	69.7	.	.	.	.	.	.	.	.	.	.
Q2	86.3	3.1	13.5	69.7	.	.	.	.	.	.	.	.	.	.
Q3	86.0	3.2	13.3	69.4	.	.	.	.	.	.	.	.	.	.
Q4	84.2	3.0	13.1	68.1	.	.	.	.	.	.	.	.	.	.

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

1) A slight difference (0.1 percentage points of GDP) exists between the government debt-to-GDP ratio for 2019 and for the fourth quarter of 2019. This is explained by a difference between annual GDP and the four-quarter moving sum of GDP.

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
2016	-0.8	-0.7	0.2	0.3	0.3	-0.1	0.0	0.1	0.0	-0.1	-0.3	1.6
2017	-2.3	-1.0	-0.1	0.4	0.5	0.0	-0.2	0.1	-0.1	-0.4	-1.2	0.9
2018	-1.9	-1.4	0.4	0.5	0.4	-0.1	0.0	0.2	0.0	-0.1	-0.9	0.8
2019	-1.7	-1.0	0.1	0.2	0.0	0.0	0.1	0.2	-0.1	0.0	-0.9	0.9
2019 Q1	-1.3	-1.2	0.8	0.6	0.6	-0.2	0.0	0.2	0.1	0.1	-0.8	1.3
Q2	-1.0	-1.1	0.8	0.7	0.7	-0.1	0.0	0.2	0.1	0.0	-0.7	1.4
Q3	-1.2	-0.9	0.6	0.3	0.2	-0.1	0.0	0.2	-0.1	0.3	-0.9	1.4
Q4	-1.7	-1.0	0.1	0.2	0.0	0.0	0.1	0.2	-0.2	0.0	-0.9	0.9

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
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
2018	12.6	11.1	3.7	1.5	0.4	7.3	2.3	1.1	-0.1	2.7	2.5	0.4	0.9
2019	12.2	10.9	3.7	1.4	0.4	7.5	2.1	1.3	-0.1	2.4	2.1	0.3	1.1
2018 Q4	12.6	11.1	3.7	1.5	0.4	7.3	2.3	1.1	-0.1	2.7	2.5	0.4	0.9
2019 Q1	12.4	10.9	3.7	1.5	0.4	7.4	2.3	1.1	0.0	2.6	2.5	0.5	1.0
Q2	12.5	11.1	3.6	1.5	0.4	7.4	2.3	1.3	0.0	2.6	2.3	0.5	0.9
Q3	12.7	11.3	3.8	1.5	0.4	7.4	2.2	1.3	-0.1	2.5	2.1	0.3	1.0
2019 Oct.	12.5	11.0	3.4	1.5	0.4	7.5	2.2	1.3	-0.1	2.5	2.1	0.3	1.2
Nov.	12.5	11.1	3.4	1.4	0.4	7.5	2.1	1.3	-0.1	2.4	2.0	0.3	1.2
Dec.	12.2	10.9	3.7	1.4	0.4	7.5	2.1	1.3	-0.1	2.4	2.1	0.3	1.1
2020 Jan.	12.3	10.9	4.1	1.4	0.4	7.5	2.1	1.3	-0.1	2.4	1.9	0.2	1.1
Feb.	12.0	10.7	4.1	1.3	0.3	7.6	2.1	1.2	-0.1	2.4	1.9	0.2	1.1
Mar.	12.2	10.9	4.0	1.3	0.3	7.6	2.0	1.2	-0.1	2.4	1.9	0.1	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 [1]	Italy	Cyprus
	1	2	3	4	5	6	7	8	9
	Government deficit (-)/surplus (+)								
2016	-2.4	1.2	-0.5	-0.7	0.5	-4.3	-3.6	-2.4	0.3
2017	-0.7	1.2	-0.8	-0.3	0.7	-3.0	-2.9	-2.4	2.0
2018	-0.8	1.9	-0.6	0.1	1.0	-2.5	-2.3	-2.2	-3.7
2019	-1.9	1.4	-0.3	0.4	1.5	-2.8	-3.0	-1.6	1.7
2019 Q1	-1.1	1.8	-0.9	0.0	0.4	-2.5	-2.7	-2.2	-5.1
Q2	-1.6	1.7	-0.9	0.4	0.6	-2.8	-3.0	-2.2	-4.9
Q3	-1.8	1.5	-1.0	0.5	0.6	-2.7	-3.3	-2.0	2.2
Q4	-1.9	1.4	-0.3	0.4	1.5	-2.8	-3.0	-1.6	1.7
	Government debt								
2016	104.9	69.2	10.2	73.8	178.5	99.2	98.0	134.8	103.4
2017	101.7	65.3	9.3	67.7	176.2	98.6	98.3	134.1	93.9
2018	99.8	61.9	8.4	63.5	181.2	97.6	98.1	134.8	100.6
2019	98.6	59.8	8.4	58.8	176.6	95.5	98.1	134.8	95.5
2019 Q1	103.1	61.7	7.8	65.3	182.0	98.6	99.6	136.4	103.1
Q2	102.3	61.1	9.1	63.9	179.5	98.6	99.6	137.8	107.0
Q3	102.1	61.1	9.0	62.5	178.1	97.5	100.4	137.1	97.8
Q4	98.6	59.8	8.4	58.8	176.6	95.5	98.4	134.8	95.5

	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Austria	Portugal	Slovenia	Slovakia	Finland
	10	11	12	13	14	15	16	17	18	19
	Government deficit (-)/surplus (+)									
2016	0.2	0.2	1.8	1.0	0.0	-1.5	-1.9	-1.9	-2.5	-1.7
2017	-0.8	0.5	1.3	3.3	1.3	-0.8	-3.0	0.0	-1.0	-0.7
2018	-0.8	0.6	3.1	1.9	1.4	0.2	-0.4	0.7	-1.0	-0.9
2019	-0.2	0.3	2.2	0.5	1.7	0.7	0.2	0.5	-1.3	-1.1
2019 Q1	-0.9	0.2	3.8	1.6	1.5	-0.1	-0.2	0.5	-1.0	-1.1
Q2	-1.4	0.0	3.9	1.1	1.5	0.3	0.1	0.5	-1.0	-1.3
Q3	-1.1	-0.3	3.0	0.5	1.3	0.3	-0.1	0.6	-1.1	-2.0
Q4	-0.2	0.3	2.2	0.5	1.7	0.7	0.2	0.5	-1.3	-1.1
	Government debt									
2016	40.9	39.7	20.1	55.5	61.9	82.9	131.5	78.7	52.0	63.2
2017	39.3	39.1	22.3	50.3	56.9	78.3	126.1	74.1	51.3	61.3
2018	37.2	33.8	21.0	45.6	52.4	74.0	122.0	70.4	49.4	59.6
2019	36.9	36.3	22.1	43.1	48.6	70.4	117.7	66.1	48.0	59.4
2019 Q1	38.6	33.8	20.7	46.3	50.8	72.7	123.4	68.1	49.3	59.5
Q2	37.5	35.9	20.3	45.7	50.9	71.8	120.8	67.7	48.6	61.5
Q3	37.1	35.7	20.0	43.4	49.2	71.1	120.2	68.1	48.4	60.2
Q4	36.9	36.3	22.1	43.1	48.6	70.4	117.7	66.1	48.0	59.4

Source: Eurostat.

1) A slight difference (0.3 percentage points of GDP) exists between the government debt-to-GDP ratio for 2019 and for the fourth quarter of 2019. This is explained by a difference between annual GDP and the four-quarter moving sum of GDP.

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For specific terminology please refer to the ECB glossary (available in English only).

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