EUROPEAN CENTRAL BANK

EUROSYSTEM

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Contents

Update on economic, financial and monetary developments

Summary

Economic activity

At the global level, economic activity continued to expand, albeit at a measurably moderating pace, amid a combination of factors, most prominently persistent supply bottlenecks. The Purchasing Managers' Index data for August and September 2021 suggest that momentum moderated in advanced economies, although it remained above its historical average, while it was softer in emerging market economies. At the same time, global supplier delivery times remained at record highs in September, owing primarily to strong demand. World trade growth also continued to soften, albeit from still high levels. Price pressures remain elevated on account of increasing food and energy inflation, reflecting the rebound from the low price levels recorded immediately after the onset of the coronavirus (COVID-19) pandemic. Most of the price pressures are judged to be of a temporary nature.

The euro area economy continued to recover strongly, although momentum moderated to some extent. Output is expected to exceed its pre-pandemic level by the end of the year. The grip of the pandemic on the economy has visibly weakened, with a high share of people now vaccinated. This is supporting consumer spending, especially on entertainment, dining, travel and transportation. But higher energy prices may reduce purchasing power in the months to come.

The recovery in domestic and global demand is also supporting production and business investment. That said, shortages of materials, equipment and labour are holding back the manufacturing sector. Delivery times have lengthened considerably, and transport costs and energy prices have surged. These constraints are clouding the outlook for the coming quarters. The labour market continues to improve. Unemployment has fallen and the number of people in job retention schemes is down significantly from the peak last year. This supports the prospect of higher incomes and increased spending. But, both the number of people in the labour force and the hours worked in the economy remain below their pre-pandemic levels.

To sustain the recovery, targeted and coordinated fiscal support should continue to complement monetary policy. This support will also help the economy adjust to the structural changes that are under way. An effective implementation of the Next Generation EU programme and the "Fit for 55" package will contribute to a stronger, greener and more even recovery across euro area countries.

Inflation

Euro area inflation increased to 3.4% in September and is expected to rise further this year. But while the current phase of higher inflation will last longer than originally expected, inflation is expected to decline in the course of next year. The upswing in inflation largely reflects a combination of three factors. First, energy prices – especially for oil, gas and electricity – have risen sharply. In September, energy inflation accounted for about half of overall inflation. Second, prices are also going up because recovering demand related to the reopening of the economy is outpacing supply. These dynamics are especially visible in the prices of consumer services, as well as the prices of goods affected most strongly by supply shortages. And finally, base effects related to the end of the VAT cut in Germany are still contributing to higher inflation. The influence of all three factors is expected to ease in the course of 2022 or to fall out of the year-on-year inflation calculation. As the recovery continues, the gradual return of the economy to full capacity will underpin a rise in wages over time. Market and survey-based measures of longer-term inflation expectations have moved closer to 2%. These factors will support underlying inflation and the return of inflation to the ECB's 2% target over the medium term.

Risk assessment

The recovery continues to depend on the course of the pandemic and further progress with vaccinations. The Governing Council sees the risks to the economic outlook as broadly balanced. In the near term, supply bottlenecks and rising energy prices are the main risks to the pace of recovery and the outlook for inflation. If supply shortages and higher energy prices last longer, these could slow down the recovery. At the same time, if persistent bottlenecks feed through into higher than anticipated wage rises or the economy returns more quickly to full capacity, price pressures could become stronger. However, economic activity could outperform current expectations if consumers become more confident and save less than currently expected.

Financial and monetary conditions

Growth and medium-term inflation dynamics still depend on favourable financing conditions for all sectors of the economy. Market interest rates have increased. Nevertheless, financing conditions for the economy remain favourable, not least because bank lending rates for firms and households remain at historically low levels.

The forward curve of the benchmark euro short-term rate (€STR) steepened significantly during the review period, which in part reflected market participants' repricing of an earlier rise in policy interest rates. At the same time, longer-term nominal risk-free rates – as well as sovereign bond yields – rose on the back of a marked rise in inflation compensation. Equity prices for non-financial corporations

and corporate bond spreads remained broadly unchanged, while bank equity prices increased. The euro depreciated in trade-weighted terms.

Money creation in the euro area continued to normalise in September 2021, reflecting an improving situation regarding the pandemic and policy support measures. Eurosystem asset purchases remained the dominant source of money creation.

While there was a pick-up in September, lending to firms remains moderate. This continues to reflect the fact that firms generally need less external funding, since these have high cash holdings and are increasingly retaining their earnings. Lending to households remains strong, driven by demand for mortgages. The most recent euro area bank lending survey shows that credit conditions for firms stabilised and were supported – for the first time since 2018 – by a reduction in banks' risk perceptions. By contrast, banks are taking a slightly more cautious approach to housing loans and have tightened their lending standards for these loans accordingly. Bank balance sheets continue to be supported by favourable funding conditions and remain solid.

Monetary policy decisions

Against this background, at its monetary policy meeting in October, the Governing Council continued to judge that favourable financing conditions can be maintained with a moderately lower pace of net asset purchases under the pandemic emergency purchase programme (PEPP) than in the second and third quarters of this year.

The Governing Council also confirmed its other measures to support the ECB's price stability mandate, namely the level of the key ECB interest rates, the Governing Council's forward guidance on their likely future evolution, Eurosystem purchases under the asset purchase programme (APP), the Governing Council's reinvestment policies and its longer-term refinancing operations.

The Governing Council stands ready to adjust all of its instruments, as appropriate, to ensure that inflation stabilises at the ECB's 2% target over the medium term.

1 External environment

At the global level, economic activity is decelerating owing to combination of factors, most prominently persistent supply bottlenecks. The Purchasing Managers' Index data for August and September suggest that momentum moderated in advanced economies, although it remained above its historical average, while it was softer in emerging market economies. At the same time, global supplier delivery times remained at record highs in September, owing primarily to strong demand but also reflecting persistent supply constraints. World trade growth also continued to soften, albeit from still elevated levels. Price pressures are still elevated on account of increasing food and energy inflation, reflecting the rebound from the low price levels recorded immediately after the onset of the coronavirus (COVID-19) pandemic. Most of the price pressures are judged to be of a temporary nature.

Global economic activity is decelerating owing to a combination of factors, most prominently persistent supply bottlenecks. The moderating growth momentum partly reflects a normalisation from the post-COVID-19 rebound as base and re-opening effects fade and stimulus wanes. At the same time, adverse idiosyncratic factors in selected major economies – such as COVID-19 resurgences, labour shortages and a property sector slowdown – imply rising downside risks to the outlook. These are reinforced by broad-based supply chain disruptions. Box 1 presents an assessment of the scarring effects of the pandemic at a global level. It concludes that global potential output has declined during the pandemic, albeit less than during the Great Recession and mostly on account of temporary factors.

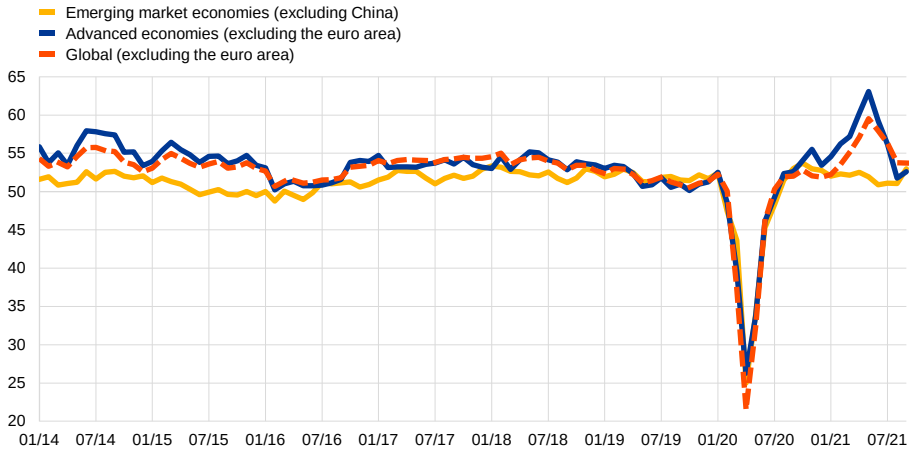
The slowdown in the global recovery is reflected in survey data. The global composite output Purchasing Managers' Index (PMI) – excluding the euro area – confirmed that growth momentum moderated in advanced economies in August and September (Chart 1), although it remained well above its historical average. Growth momentum in emerging market economies remained softer than in advanced economies, especially in manufacturing. Specifically, industrial production momentum continued to soften in advanced economies in July, while it contracted for the third consecutive month in emerging markets.

Supply bottlenecks show no signs of normalisation. Global supplier delivery times remained at record highs in September. According to internal estimates, demand factors account for about two-thirds of the lengthening of delivery times. Supply constraints are proving to be rather persistent, given that pre-existing bottlenecks, such as the semiconductor shortage, are being compounded by other factors, namely global strains in energy markets, rising labour shortages and, in some regions, pandemic-related disruptions, such as factory and port closures.

Chart 1

Global composite output PMI (excluding the euro area)

(diffusion indices)



Sources: Markit and ECB calculations.
Note: The latest observations are for September 2021.

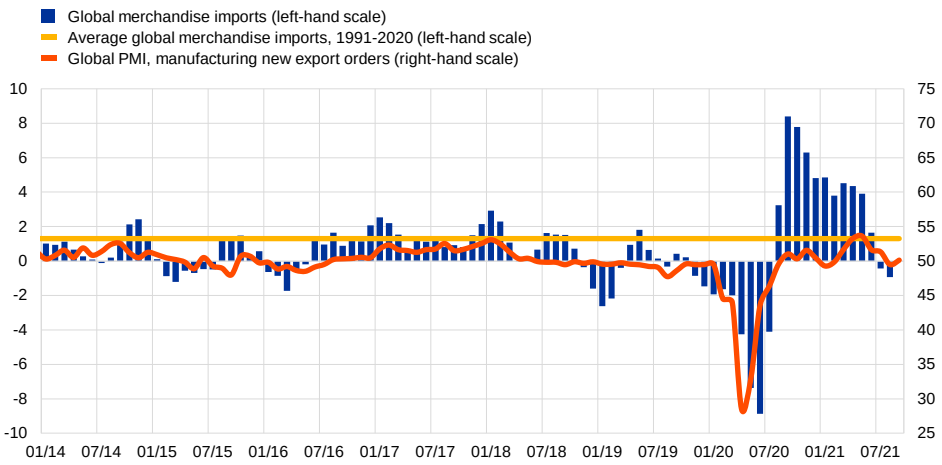
World trade growth continues to soften, albeit from still-elevated levels.

Although world (excluding the euro area) merchandise import volumes were still above their pre-pandemic levels and picked up slightly in August, trade growth momentum (measured in three-month-on-three-month terms) remained in negative territory (Chart 2). The volume of merchandise trade has decreased since the peak recorded in March. The moderation in global trade activity is confirmed by the global manufacturing new export orders PMI, which in the third quarter was, on average, just above the expansionary threshold. At the same time, new data from the World Trade Organization (WTO) point to a steady increase in commercial services trade in the second quarter, although it remains 20 percentage points below its pre-pandemic level.

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 August 2021 for global merchandise imports and September 2021 for the PMIs.

Global price pressures remain elevated. Annual consumer price index (CPI) inflation in the countries of the Organisation for Economic Co-operation and Development (OECD) increased marginally in August to 4.3% on account of increasing food and energy inflation, still reflecting the rebound from the low price levels recorded after the COVID-19 outbreak. Meanwhile, core inflation remained stable at 3.1%, unchanged since June. Most of the current price pressures are still seen as temporary. Nevertheless, inflation expectations for 2022 slightly increased in advanced economies in September. At the same time, input and output prices from PMIs for advanced economies remained close to historically high levels, amid record-high freight rates, while price pressures again rose in emerging markets.

Oil prices climbed on the back of demand and supply factors. Oil prices have increased to well above pre-pandemic levels since the Governing Council meeting in September, supported by the ongoing global economic recovery and substitution from gas to oil amid high gas prices. On the supply side, OPEC+ failed to reach its targets in August and September, mainly owing to capacity problems in Nigeria and Angola. Moreover, at its October meeting OPEC+ indicated that it would stick to its existing plan, resisting calls to further lift its production targets to stabilise energy prices. In the United States, the recovery in shale oil production has been sluggish and supply was further interrupted by Hurricane Ida. Food and metal prices have also increased since the last Governing Council meeting, with higher energy input costs more prominently supporting copper and aluminium prices.

In the United States, the economic recovery is moderating amid supply chain constraints and the surge in Delta variant cases. COVID-19 cases increased at the start of the third quarter, leading to a plunge in consumer confidence and lower spending, especially in vulnerable industries. In addition, household disposable income fell in real terms in August, as unemployment benefits fell back to pre-COVID-19 levels. These two factors, together with the ongoing challenges along supply chains, are expected to weigh on activity in the second half of the year.

Annual headline CPI remained high at 5.4% in September, while inflation less food and energy remained unchanged at 4.0%. In month-on-month terms, inflation increased in September after having decreased in August. Supply chain disruptions represent an upside risk to future inflation. However, although households' short-term inflation expectations have risen recently, longer-term expectations have remained well anchored so far.

In the United Kingdom, the economy is slowing following a strong rebound in the second quarter of 2021. UK GDP rebounded sharply by 5.5% in the second quarter of 2021, which also reflected an improved trade balance. However, the combination of the Delta variant spike, labour shortages and broader supply-side disruptions led to a moderation of growth to 0.4% month on month in August. Retail sales and business and consumer confidence surveys also signal a slowdown in the third quarter. Annual UK CPI, the Bank of England's target inflation rate, eased to 3.1% in September, while core CPI inflation dropped to 2.9%. The slowdown in the annual rate of headline inflation in September was mainly driven by a lower contribution from restaurant and hotel prices, which was only partially offset by an increase in transport prices.

In Japan, a firmer recovery is no longer expected until nearer the end of the year amid headwinds from lingering supply bottlenecks. A surge in new infections in the early summer and the expansion of the latest state of emergency weighed on mobility and consumption in August. Given that the number of cases has steadily decreased, consumption is expected to recover to some extent in September, as indicated by the latest survey data. As a result, the economy is expected to move towards a broader recovery by the end of the year. Annual headline inflation returned to positive territory in September (0.2%), partly reflecting a higher energy price contribution and increasing food prices. However, core inflation declined marginally to -0.8% in September.

In China, GDP decelerated in the third quarter. Economic activity rose by 0.2% in quarter-on-quarter terms in the third quarter (4.9% year on year), compared with 1.2% in the previous quarter. The slowing momentum is related to the COVID-19 outbreak, power shortages and the property sector slowdown. Monthly indicators for September point to a gradual pick-up in retail sales since July. By contrast, industrial production and investment continued to decelerate. Rising uncertainties related to real estate activity and energy constraints are increasing downside risks for the near-term growth outlook. CPI inflation decreased to 0.7% year on year in September, pointing to subdued inflation, which was due largely to base effects and ongoing food price deflation amid normalising pork prices. By contrast, producer price index (PPI) inflation increased to 10.7% year on year, the highest rate of increase in around 25 years, mainly on the back of strong price increases in coal and other energy-intensive industries.

2 Financial developments

Against the backdrop of rising inflationary pressures as the dominant theme in the financial markets during the review period, the forward curve of the benchmark euro short-term rate (€STR) steepened significantly, mainly reflecting market participants pricing in an earlier rise in policy interest rates. Likewise, longer-term nominal risk-free rates – and with them sovereign bond yields – rose on the back of a marked rise in inflation compensation. Equity prices for non-financial corporations and corporate bond spreads remained broadly unchanged in the review period, while bank equity prices increased. The euro depreciated in trade-weighted terms.

The benchmark €STR and euro overnight index average (EONIA) averaged -57 and -49 basis points respectively over the review period (9 September to 27 October 2021).[1] Excess liquidity increased by approximately €20 billion to around €4,424 billion, mainly reflecting asset purchases under the pandemic emergency purchase programme (PEPP) and the asset purchase programme (APP), as well as the €97.57 billion take-up of the ninth operation under the third series of targeted longer-term refinancing operations (TLTRO III). However, the growth in excess liquidity was substantially curtailed by €79.24 billion in early repayments of funds borrowed under previous TLTRO III operations and a net decline in other assets of around €107 billion over the review period.

The €STR forward curve steepened considerably, with market participants, in response to rising near-term inflationary pressures, pricing in an earlier rise in policy interest rates. The forward curve implies that the €STR remains at its current level (-57 basis points) until June 2022, after which it increases and reaches 26 basis points at the end of 2027. On the back of a significant increase in market-based measures of inflation compensation, the timing of the €STR exceeding its current level by 10 basis points, as reflected in the forward curve, has shifted from the beginning of 2024 to late 2022, and now stands more than a year earlier than at the beginning of the review period.

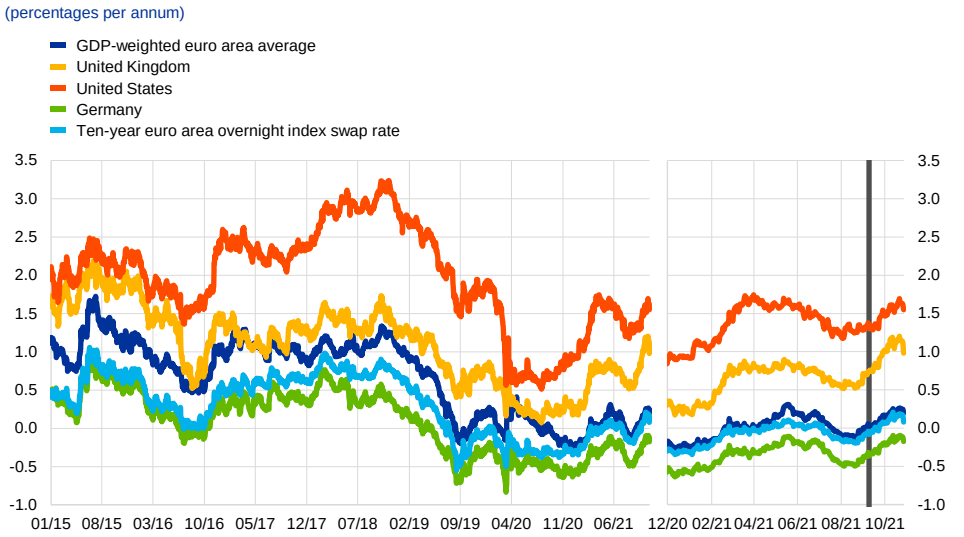
Long-term sovereign bond yields broadly mirrored the development of nominal risk-free rates (Chart 3). Over the review period, the GDP-weighted euro area and German ten-year sovereign bond yields increased by 20 and 19 basis points to 0.20% and -0.18% respectively, while ten-year sovereign bond yields in Spain and Portugal increased by 16 and 18 basis points respectively. These increases broadly mirrored developments in long-term risk-free interest rates, with the ten-year nominal overnight index swap (OIS) rate increasing by 16 basis points to 0.08%. Over the same period, ten-year US government bond yields increased by 25 basis points to 1.55%, while ten-year UK government bond yields rose by 24 basis points to 0.98%. The marginally smaller increase in euro area sovereign bond yields relative to the United States and the United Kingdom can be attributed to market participants pricing in an earlier monetary policy normalisation in the United States and the United Kingdom than in the euro area. Euro area bond markets

[1] The methodology for calculating the EONIA changed on 2 October 2019; it has since been 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. The EONIA will be discontinued on 3 January 2022.

smoothly absorbed the EU's successful auction of its first Next Generation EU green bond, the largest green bond issue on record.

Chart 3

Ten-year sovereign bond yields



Sources: Refinitiv and ECB calculations.
Notes: The vertical grey line denotes the start of the review period on 9 September 2021. The latest observation is for 27 October 2021.

Long-term euro area sovereign bond spreads relative to OIS rates edged up slightly. The German ten-year sovereign bond spread became slightly less negative, ending the review period at -0.25%. The French and Italian ten-year bond spreads over the corresponding OIS rate widened by 4 and 6 basis points to 0.09% and 0.82% respectively. Overall, changes in individual sovereign spreads to risk-free rates were limited, as also reflected in the aggregate ten-year euro area GDP-weighted sovereign bond spread, which widened by 4 basis points to 0.12%. This metric remains close to the very low levels observed at the beginning of the review period and significantly below the levels prevailing before the start of the coronavirus (COVID-19) crisis.

Equity prices of non-financial corporations remained broadly unchanged over the review period, while bank equity prices recorded strong gains. The negative impact of higher discount rates on equity prices was counterbalanced by stronger earnings growth expectations in both the euro area and the United States. Non-financial stock prices remained broadly unchanged, continuing to stand close to record high levels. While higher discount rates weighed on equity prices more generally, bank equity prices increased by 6% in the euro area and by 12% in the United States. Over the second half of September, the impact of a potential default by Chinese property developer Evergrande had weighed on global capital markets, as reflected in temporarily higher price volatility, but was later perceived as sufficiently contained by the Chinese authorities.

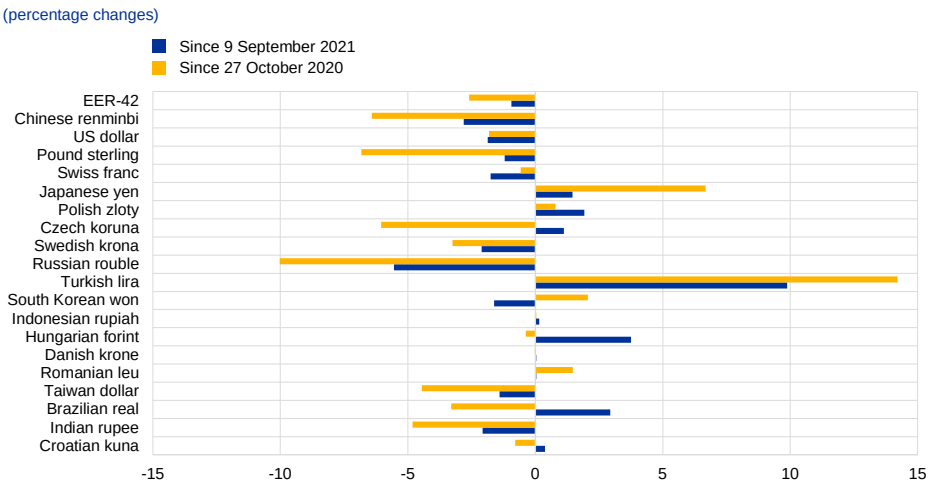
Both financial and non-financial corporate bond spreads remained broadly unchanged over the review period, standing below their pre-pandemic levels.

Spreads (relative to the risk-free rate) on investment-grade financial and non-financial bonds stood at 49 and 39 basis points respectively at the end of the review period, well below their pre-pandemic levels. Overall, investors and rating agencies appear to remain optimistic about the profitability and credit outlook for euro area corporates.

In foreign exchange markets, the euro depreciated in trade-weighted terms (Chart 4), reflecting a broad-based weakening against several major currencies. Over the review period the nominal effective exchange rate of the euro, as measured against the currencies of 42 of the euro area's most important trading partners, weakened by 0.9%. The euro depreciated against the US dollar (by 1.8%), continuing its recent downward trend and reflecting market expectations of a faster normalisation of US monetary policy relative to the euro area. The euro also weakened against other major currencies, including the Chinese renminbi (by 2.8%), the Swiss franc (by 1.8%) and the pound sterling (by 1.2%), and strongly depreciated (by 5.5%) against the Russian rouble, which displayed broad-based strength in the context of the recent increase in energy prices. Over the same period the euro appreciated significantly against the Turkish lira (by 9.9%) and the Brazilian real (by 2.9%), amid their recent broad-based volatility. The euro also continued appreciating against the currencies of several non-euro area EU Member States, including the Hungarian forint (by 3.8%), the Polish zloty (by 1.9%) and the Czech koruna (by 1.1%).

Chart 4

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



Source: ECB.
Notes: EER-42 is the nominal effective exchange rate of the euro against the currencies of 42 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 27 October 2021.

3 Economic activity

Economic activity in the euro area continued its recovery path in the third quarter of 2021 after having expanded by 2.1%, quarter on quarter, in the second quarter. The lifting of pandemic-related restrictions, high vaccination rates and reduced fear of contagion enabled contact-intensive market services and tourism to rebound strongly in the summer months. At the same time, production in the manufacturing sector has continued to be held back by shortages of materials, equipment and labour, as well as by rising transport costs and energy prices.

Output growth is expected to remain dynamic in the period ahead, albeit slowing towards the end of the year. Consumer spending, particularly for services, continues to rebound and consumer confidence is strong, although the impact of the higher oil prices may reduce households' purchasing power. At the same time, the labour market continues to improve, which supports the prospect of higher incomes and increased spending. Moreover, the recovery in domestic and global demand is supporting business investment, but supply-side constraints continue to weigh on production and trade, particularly in the capital goods sector.

To sustain the recovery, targeted and coordinated fiscal support should continue to complement monetary policy. This support will also help the economy adjust to the structural changes that are under way. An effective implementation of the Next Generation EU programme and the "Fit for 55" package will contribute to a stronger, greener and more even recovery across euro area countries.

The risks to the euro area growth outlook are seen as broadly balanced. Nevertheless,, the pandemic-related uncertainties remain high. The pace of the recovery could be slowed by downside risks relating to supply bottlenecks and rising energy prices. However, greater than expected dissaving by consumers could lead to a stronger expansion than currently envisaged.

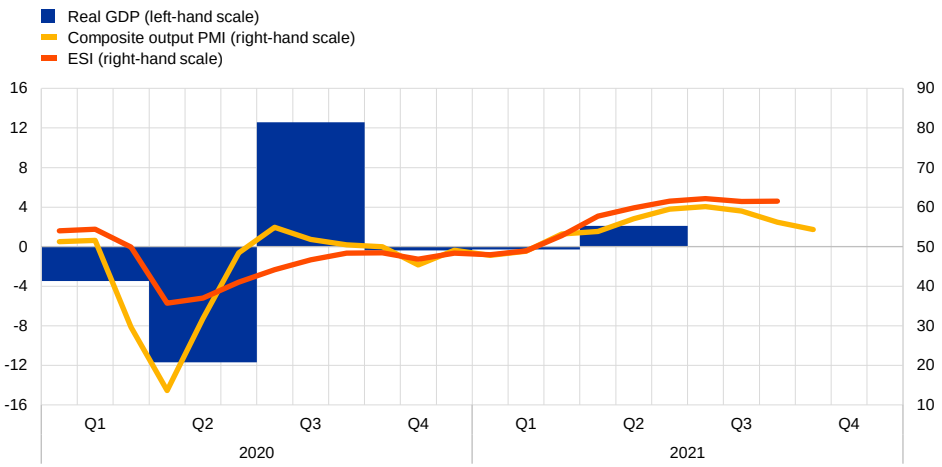
Following two quarters of falling output, euro area real GDP rebounded in the second quarter of 2021 and is estimated to have strengthened further in the third quarter.[2] In the second quarter economic activity rebounded, with GDP rising by 2.1%, quarter on quarter. This outcome more than offset the 0.7% cumulative fall over the two previous quarters. However, GDP was still 2.7% below the pre-pandemic peak seen at the end of 2019 (Chart 5). The expenditure breakdown shows that domestic demand was the main contributor to growth alongside a small positive contribution from net trade. At the same time, changes in inventories contributed negatively to growth in the second quarter, following two quarters of strong positive contributions. The rise in activity in the second quarter was broad-based across countries.

[2] Real GDP grew by 2.2% in the third quarter according to Eurostat's flash estimate that was published after the Governing Council meeting on 28 October. This estimate is broadly in line with the September 2021 ECB staff macroeconomic projections for the euro area.

Chart 5

Euro area real GDP, composite output PMI and ESI

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



Sources: Eurostat, European Commission, Markit and ECB calculations.
Notes: The two lines indicate monthly developments; the bars show quarterly data. The European Commission's Economic Sentiment Indicator (ESI) has been standardised and rescaled to have the same mean and standard deviation as the Purchasing Managers' Index (PMI). The latest observations are for the second quarter of 2021 for real GDP, September 2021 for the ESI and October 2021 for the PMI.

The combination of hard data, survey results and high-frequency indicators point to continued strong GDP growth in the third quarter of this year, before a moderation in the fourth quarter. This outcome would reflect the increased vaccination rates and declining infection rates in the third quarter that enabled the observed relaxation of containment measures. Growth in the third quarter is likely to have been mainly driven by the services sector, as part of the manufacturing sector remained affected by supply-side bottlenecks. These bottlenecks, together with labour shortages, are likely to curb output growth towards the end of the year, while any offsetting impact from the services sector might be less pronounced given that the fourth quarter typically is a less tourism-intense period. Box 5 provides a more in-depth review of the role of contact-intensive services in the recovery. Companies operating in the non-financial sector broadly confirm this overall narrative about the short-term outlook (see Box 2).

Turning to the most recent monthly data, industrial production fell by 1.6%, month on month, in August after a similar-sized increase in July. The more timely composite output Purchasing Managers' Index (PMI) rose to 58.4 in the third quarter of 2021, up from 56.8 in the second quarter, reflecting falling manufacturing output (to 58.6) and rising activity in services (to 58.4). However, in October the PMI declined further, reaching 54.3, driven by developments in both services business activity and manufacturing output. Manufacturing supply bottlenecks, as captured by the PMI suppliers' delivery times index, intensified in October. A record high level of stocks of purchases in manufacturing was recorded in October, suggesting additional inventory building to deal with potential supply shortages. The European Commission's Economic Sentiment Indicator (ESI) also increased from the second to the third quarter, remaining well above the pre-pandemic level seen in February last year. This rise was broad-based across its components, with the largest increase recorded for services. At the same time, high-frequency indicators related to

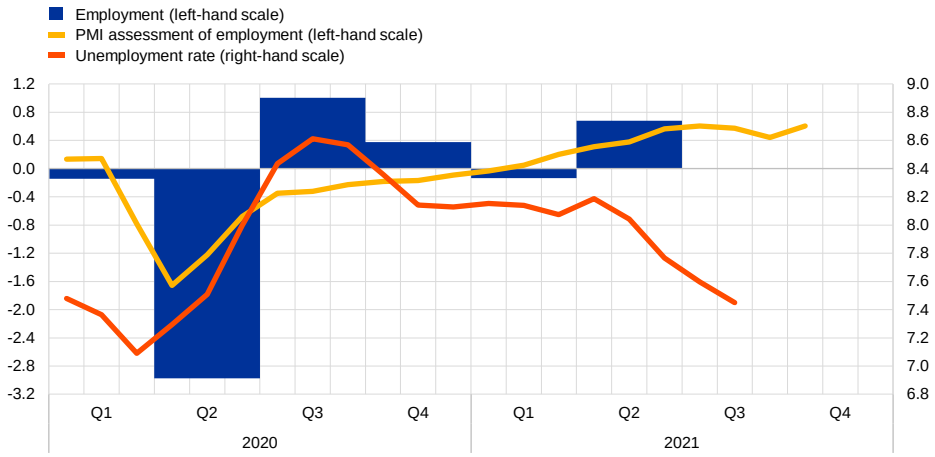
consumption stabilised at around pre-pandemic levels in the third quarter, signalling stronger demand for services (e.g. recreation, restaurants and hotels) than for goods (e.g. passenger cars).

The unemployment rate in the euro area declined in August, still supported by job retention schemes.[3] The rate stood at 7.5% in August, 0.1 percentage points lower than in July (Chart 6) and around 0.1 percentage points higher than before the pandemic in February 2020. The number of workers in job retention schemes is declining and represented around 2% of the labour force in August. Employment increased by 0.7% in the second quarter of 2021, following a decrease of 0.1% in the first quarter.[4] Total hours worked increased by 2.3% in the second quarter, following a 0.3% decline in the first quarter of 2021. These recent developments reflect the impact of the relaxation of pandemic-related restrictions following the vaccination campaigns. However, total hours worked in the second quarter of 2021 remained 4.1% below the level recorded in the fourth quarter of 2019. Similarly, labour force participation in the second quarter of 2021 was still lower than pre-crisis levels by around 1.4 million people.[5]

Chart 6

Euro area employment, the PMI employment indicator and the unemployment rate

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



Sources: Eurostat, Markit and ECB calculations.
Notes: The two lines indicate monthly developments; the bars show quarterly data. The PMI is expressed as a deviation from 50 divided by 10. The latest observations are for the second quarter of 2021 for employment, October 2021 for the PMI and August 2021 for the unemployment rate.

Short-term labour market indicators have continued to improve. The monthly composite PMI employment indicator, encompassing industry and services, increased to 56.1 in October from 54.4 in September, thus remaining above the

3 For an overview of the use of government-supported job retention schemes during the pandemic, see Chart 11 in the article entitled "Hours worked in the euro area", *Economic Bulletin*, Issue 6, ECB, 2021. For a broader assessment of the euro area labour market during the pandemic, see the article on "The impact of the COVID-19 pandemic on the euro area labour market", *Economic Bulletin*, Issue 8, ECB, 2020.

4 See also Box 4 entitled "The impact of the COVID-19 pandemic on labour productivity growth" in this issue of the Economic Bulletin.

5 More recent but preliminary monthly unemployment figures for July and August 2021 suggest that the labour force participation rate increased in the third quarter of 2021. See also Box 3 entitled "Labour force participation during the pandemic" in this issue of the Economic Bulletin.

threshold level of 50 that indicates an expansion in employment. The PMI employment index has recovered significantly since its all-time low in April 2020 and stood in expansionary territory in October 2021 for the ninth consecutive month.

Household spending continued to rebound in the third quarter, reflecting high vaccination rates and reduced fear of infection. Following a few weaker readings, consumer confidence rose again to -4.0 in September (after -5.3 in August). Retail sales in July and August stood on average 0.1% above their level in the second quarter, reflecting the rebalancing from goods to services. Spending on holidays continued to rise during the summer, in line with improving business confidence in the accommodation and travel services sectors. Looking ahead, households remain confident about their financial situation despite rising energy prices. The extent to which the current surge in energy prices may slow down the recovery in private consumption depends on whether the price increases are the consequence of higher aggregate demand or disruptions in energy supply. The European Commission's consumer survey suggests that the current rise in consumer prices has so far largely been driven by higher economic activity, given elevated levels of household expectations regarding both economic activity and their own financial situation. This stands in stark contrast with, for example, the response at the time of the Iraqi invasion of Kuwait in 1990, when severe disruptions in oil supply led households to immediately revise down their expectations regarding income and activity.

Corporate investment continued to be hampered by supply-side disruptions during the third quarter. In July and August 2021 capital goods production fell on average by 1.2% relative to the second quarter. The PMI for new orders of capital goods continuously declined during the summer months, amid persistent supply chain bottlenecks, although it remained at high levels. At the same time, the ESI is near its all-time high and the assessment of order books according to the Commission's industry survey has increased recently, indicating ongoing strong demand for capital goods. On balance, the available indicators suggest that business investment growth remained in positive territory in the third quarter. Developments in supply-side disruptions will remain a crucial source of uncertainty for investment dynamics over the next few quarters. Since the beginning of 2021 there has been an increasing divergence between capital goods production and supplier delivery times supporting the view that the supply-side disruptions, which have caused a lengthening of intermediate input delivery times, are likely hampering capital goods production and business investment. To the extent that supply bottlenecks are expected to be resolved only gradually, they could continue to weigh on future business investment.

Housing investment continued to be affected by supply bottlenecks in the third quarter, in an environment of buoyant demand. Housing investment had already exceeded the pre-crisis level recorded in the last quarter of 2019 by more than 2% in the second quarter of 2021.[6] Although robust demand continued to support the recovery, supply constraints increasingly hampered construction activity

[6] For a comprehensive assessment of the recent drivers and near-term outlook of the euro area housing market, see the article entitled "The euro area housing market during the COVID-19 pandemic" in this issue of the Economic Bulletin.

in the third quarter. In July and August building activity was, on average, around 1% below its level in the second quarter. According to the PMI for construction output, available up to September, supply bottlenecks materialised in historically long delivery times and high input prices. Furthermore, the European Commission's construction survey, available up to September, suggests that the main limits to production were shortages of materials and workers, with only negligible constraints from demand. The uncertain evolution of the balance between supply-side headwinds and demand-side tailwinds entails high uncertainty around the short-term prospects for housing investment. On the one hand, persistent bottlenecks may lead to further rises in construction costs, thus denting profitability for firms, and put upward pressure on house prices, hence reducing affordability for households. On the other hand, favourable financing conditions and income support measures, as well as a large stock of accumulated savings, could further sustain demand, as shown by households' intentions to purchase and renovate houses, which are well above their pre-pandemic levels.[7]

The recovery in euro area trade continues at two speeds, with exports of goods remaining subdued and exports of services rebounding somewhat. Euro area total exports increased by 2.7%, quarter on quarter, in the second quarter of 2021. However, goods exports momentum slowed at the end of the second quarter, and available data for July and August point to continued weak trade developments in the third quarter of 2021. Volumes of euro area exports and imports fell in July, and the decline was broad-based across major trading partners and goods categories. The weakness can be attributed to declining foreign demand for euro area products, visible in global imports (excluding the euro area) and order-based forward-looking indicators that have also moderated. Moreover, shipping and input-related bottlenecks continued to exert a drag, in particular on euro area goods trade, in the third quarter.[8] Leading indicators for services trade have also moderated somewhat yet continue to signal some rebound in the third quarter of 2021, driven by tourism.

The euro area economy is expected to continue its recovery path, supported by monetary and fiscal policies. At the same time, the pandemic may produce more lasting shifts in demand that could lead to lingering supply and demand imbalances across sectors. To support the recovery, ambitious, targeted and coordinated fiscal policy should continue to complement monetary policy. The results of the latest round of the Survey of Professional Forecasters (conducted in early October) show that GDP growth forecasts have been revised upwards for 2021, while remaining broadly unchanged for 2022 and 2023, relative to the previous round conducted in early July.

7 This evidence is confirmed by recent data from the ECB's new Consumer Expectations Survey. See Box 6 entitled "The recovery of housing demand through the lens of the Consumer Expectations Survey" in this issue of the Economic Bulletin.

8 See Box 4 entitled "The impact of supply bottlenecks on trade" *Economic Bulletin*, Issue 6, ECB, 2021.

4 Prices and costs

According to Eurostat's final release for September, euro area annual HICP inflation increased further to 3.4% in September, up from 3.0% in August 2021. Inflation is expected to rise further this year. While the current phase of higher inflation will last longer than originally expected, inflation is expected to decline in the course of next year. The upswing in inflation largely reflects a combination of three factors. First, energy prices have risen sharply and accounted for about half of overall inflation in September. Second, prices are going up because recovering demand related to the reopening of the economy is outpacing supply. These dynamics are especially visible in the prices of consumer services, as well as the prices of goods affected most strongly by supply shortages. Finally, base effects related to the end of the VAT cut in Germany are still contributing to higher inflation. The influence of all three factors is expected to ease in the course of 2022 or to fall out of the year-on-year inflation calculation. As the recovery continues, the gradual return of the economy to full capacity will underpin a rise in wages over time. Market and survey-based measures of longer-term inflation expectations have moved closer to 2%. These factors will support underlying inflation and the return of inflation to our target over the medium term.

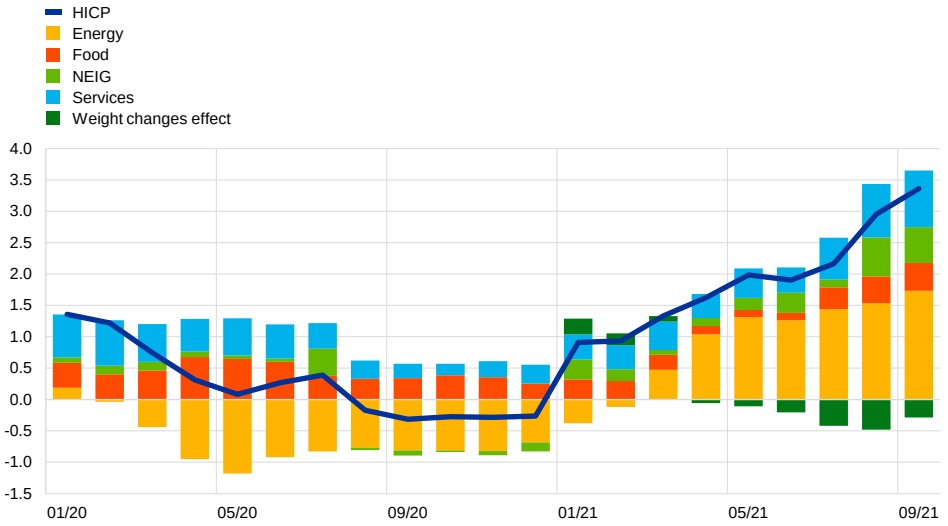
Annual HICP inflation increased further in September, owing to higher growth in energy and services prices (Chart 7). According to Eurostat's final release for September, the increase in headline HICP inflation to 3.4%, up from 3.0% in August, mainly reflects higher inflation for energy, amounting to an annual rate of change of 17.6% in September compared with 15.4% in August. However, HICP inflation excluding food and energy (HICPX) also increased further from 1.6% in August to 1.9% in September, as a result of stronger increases in services prices which stood at 1.7% in September, up from 1.1% in August. At the same time, the increase in non-energy industrial goods (NEIG) prices slowed to 2.1% in September, down from 2.6% in the previous month. In September, annual growth in food prices remained at 2.0%, while there was a decline in the dampening effect on inflation of changes in HICP weights. Using 2020 HICP weights, the September outcomes for headline HICP inflation and HICPX would have been 0.3 and 0.2 percentage points higher respectively, compared with 0.5 and 0.6 percentage points higher in August.[9]

[9] For a detailed overview of the role of the changes in HICP weights on the measurement of inflation in 2021, see Box 6 entitled "2021 HICP weights and their implications for the measurement of inflation", *Economic Bulletin*, Issue 2, ECB, 2021.

Chart 7

Headline inflation and its components

(annual percentage changes; percentage point contributions)



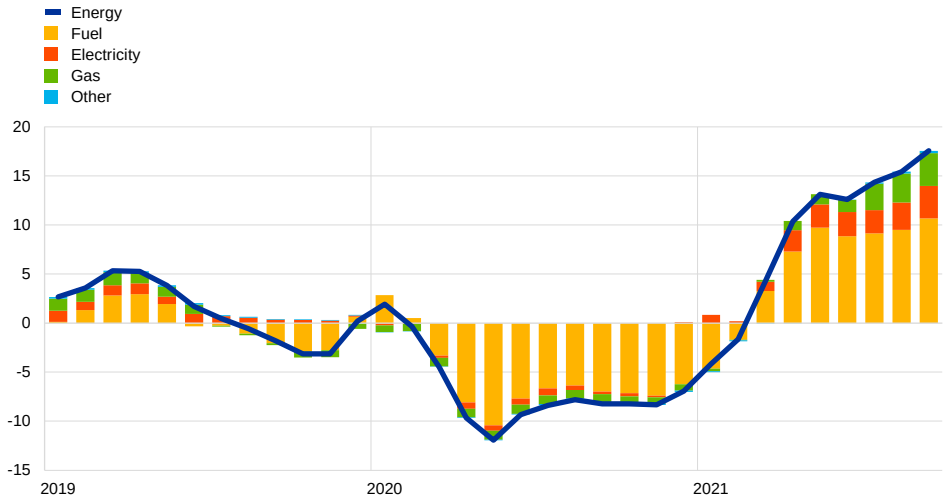
Sources: Eurostat and ECB calculations.
Notes: Contributions of HICP components are computed using HICP weights for 2020. The impact of the changes in weights is estimated by the ECB. The latest observations are for September 2021.

The surge in the energy components of HICP energy is broad-based, reflecting increases in the prices of energy commodities. Globally, energy commodity prices dropped sharply at the onset of the pandemic in 2020. They then started to recover at the end of 2020 and continued to increase in 2021. As prices have risen from the low levels recorded in 2020, these dynamics have resulted in a strong upward base effect, to a large extent explaining the current buoyant annual growth rates. However, current prices for energy commodities have surpassed pre-pandemic levels. The all-time high for HICP energy of 17.6% in September can be attributed to increases in the gas, electricity and fuel HICP components (Chart 8). Until May, the surge was driven mainly by an increase in the fuel component, reflecting the rebound in oil prices. Over more recent months, the contribution of the fuel component remained high, accompanied by increases in the gas and electricity components. The extent to which these increases translate into changes in consumer prices varies greatly from one country to another, and the impact is often lagged.

Chart 8

Energy inflation decomposition

(annual percentage changes; percentage point contributions)



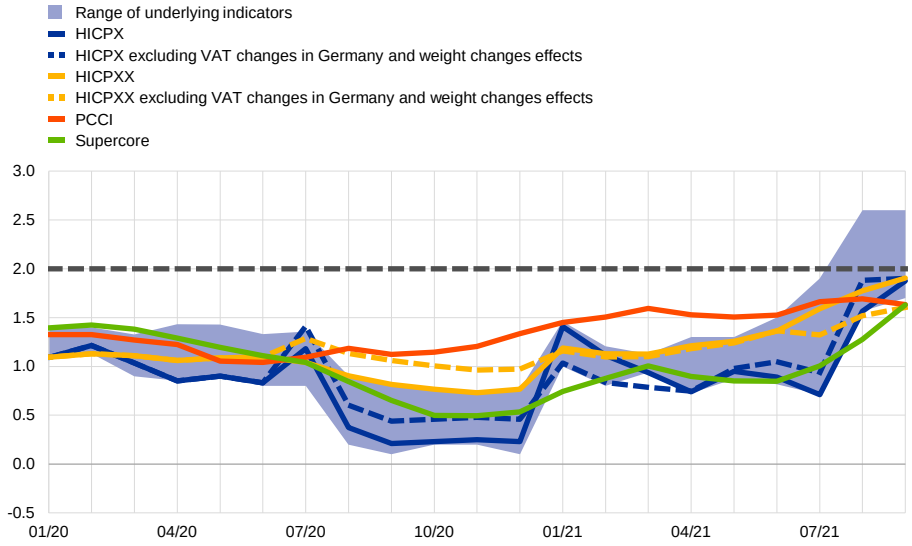
Sources: Eurostat and ECB calculations.
Notes: "Fuel" refers to the HICP component "liquid fuels and fuels and lubricants for personal transport equipment". "Other" includes "solid fuels" and "heat energy" COICOP5 items. The latest observations are for September 2021.

Most indicators of underlying inflation continued to increase (Chart 9). While the temporary VAT cut in Germany from July to December 2020 continues to have a small upward impact on HICPX inflation rates in the second half of 2021, the impact of changes in weights currently has a small dampening effect. Net of these special effects, HICPX inflation would stand at 1.9%. HICPXX inflation, which also excludes travel-related items, clothing and footwear, increased to 1.9% in September from 1.8% in August. The model-based Persistent and Common Component of Inflation (PCCI), which is less affected by the changes in weights and the temporary VAT rate reduction in Germany, declined marginally from 1.7% in August to 1.6% in September. The Supercore indicator lies at the lower end of the range of measures of underlying inflation and increased for the fourth consecutive month, edging up to 1.6% in September from 1.3% in August. Most measures of underlying inflation remain below the target of 2%.[10]

[10] Trimmed means (which remove around 5% or 15% from each tail of the distribution of annual price changes) stand above the target of 2% because they include some energy items that currently have very high inflation rates. For further information on these and other 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.

Chart 9
Measures of underlying inflation

(annual percentage changes)



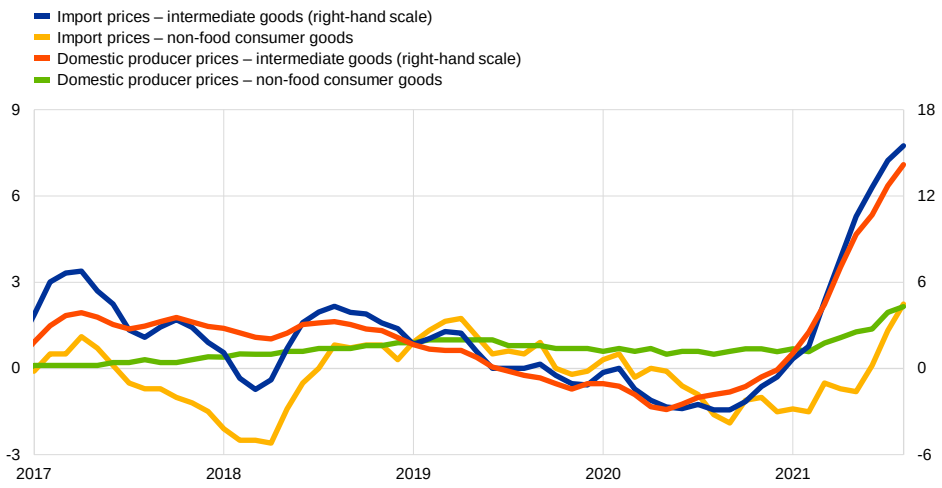
Sources: Eurostat and ECB calculations.
Notes: The range of indicators includes HICP excluding energy, HICP excluding energy and unprocessed food, HICPX (HICP excluding energy and food), HICPXX (HICP excluding energy, food, travel-related items, clothing and footwear), 10% and 30% trimmed means and the weighted median. The latest observations are for September 2021.

Pipeline price pressures for HICP non-energy industrial goods continued to build up in August, proving to be longer lasting than initially thought (Chart 10). Producer prices at different stages of the pricing chain continued to rise in July and August compared with June. At the earlier input stages, the annual rate of change in producer prices for intermediate goods rose from 12.7% in July to 14.2% in August, while for intermediate goods the annual rate of change in import prices increased from 14.5% in July to 15.5% in August. Focusing on the later stages of the pricing chain, domestic producer price inflation for non-food consumer goods – a key measure of pipeline pressures in NEIG inflation – continued to increase gradually for the sixth consecutive month, rising from 2.0% in July to reach the historically high value of 2.2% in August. The annual rate of change of import prices for non-food consumer goods also increased to 2.2% in August, up from 1.3% in July, mainly reflecting an exchange rate depreciation rather than selling prices in trading partner countries. As pipeline pressures materialise in NEIG prices with a delay, further upward pressure can be expected in the near term.

Chart 10

Indicators of pipeline price pressures

(annual percentage changes)



Sources: Eurostat and ECB calculations.
Note: The latest observations are for August 2021.

Wage pressures remain subdued overall. The latest available indicators of wage growth, such as growth in compensation per employee or growth in compensation per hour, continued to be strongly affected by measures to cushion the effects of the pandemic, such as job retention schemes. In spring 2020 these schemes pushed down compensation per employee and pushed up compensation per hour, which gave rise to strong base effects in the second quarter of 2021. Accordingly, compensation per employee increased by 8% in the second quarter of 2021, while compensation per hour decreased by 3.9%. By contrast, negotiated wages were not directly affected by developments in hours worked and the recording of benefits from job retention schemes in 2020, making them a more reliable indicator of wage pressure throughout the pandemic. At the same time, one-off pandemic-related payments recently introduced some volatility into this measure. Overall, growth in negotiated wages has remained low in recent months, and it is uncertain whether the upward impacts of recent increases in consumer price inflation will pass through to wages.[11]

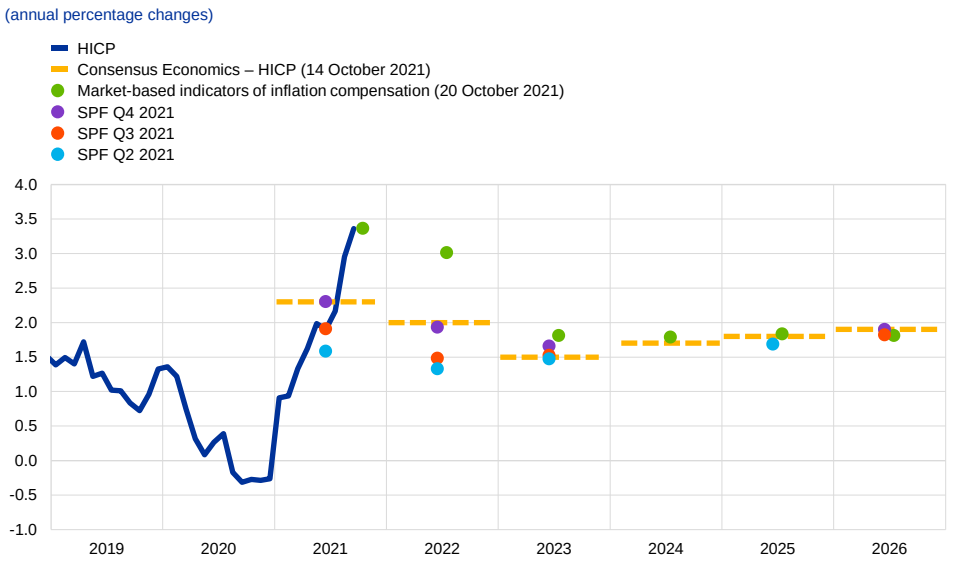
Market-based indicators of longer-term inflation expectations continued to increase further, with the five-year forward inflation-linked swap (ILS) rate five years ahead having surpassed 2% for the first time in seven years. Market-based indicators of longer-term inflation expectations reached new highs. Over the review period, the five-year forward ILS rate five years ahead rose above 2%, a level not seen since August 2014, and stood at 2.1% on 27 October 2021. While ILS rates rose across the maturity spectrum, the increase was most pronounced in short and medium-term maturities, in line with a transient but more persistent increase in near-term inflation. Markets priced in a stronger and longer transitory rise in near-term

[11] For an overview of the extent to which wages are indexed to inflation in the euro area and on the role this might play in second-round effects, see Box 7 in this issue of the Economic Bulletin: "The prevalence of wage indexation in the euro area and its potential role for the impact of inflation on wage developments".

inflation compensation than at the beginning of the review period. The increase in market-based indicators of inflation expectations, particularly in the near term, can mainly be attributed to ongoing supply-demand imbalances, namely, more persistent supply bottlenecks and rising energy prices. Nevertheless, over the next five years, inflation options markets still signal around a 40% risk-neutral probability of average inflation in the euro area staying below 2%, with the probability of inflation exceeding 3% having increased to 11%. According to the ECB Survey of Professional Forecasters (SPF) for the fourth quarter of 2021, inflation expectations have been revised upwards across the forecast horizon (Chart 11). HICP inflation expectations stand at 2.3%, 1.9% and 1.7% for 2021, 2022 and 2023 respectively. Compared with the previous round, this is an increase of 0.4 percentage points for 2021 and 2022 and 0.2 percentage points for 2023. Respondents attributed the upward revisions mainly to higher energy prices and the impact of supply chain tensions. Regarding the near-term inflation outlook, many respondents reported that they expected a further increase in the inflation rate in the last months of 2021, but continue to expect a sharp fall in inflation in the course of 2022. SPF five years ahead inflation expectations increased from 1.8% to 1.9%, moving closer to the 2% target.

Chart 11

Survey-based indicators of inflation expectations and market-based indicators of inflation compensation



Sources: Eurostat, Thomson Reuters, Consensus Economics, ECB (SPF) and ECB calculations.
Notes: The market-based indicators of the inflation compensation series are 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 compensation are for 20 October 2021. The ECB SPF for the fourth quarter of 2021 was conducted between 1 and 11 October 2021. The Consensus Economics cut-off date is 14 October 2021.

5 Money and credit

Money creation in the euro area continued to normalise in September 2021, reflecting an improving situation regarding the coronavirus (COVID-19) pandemic and policy support measures. Eurosystem asset purchases remained the dominant source of money creation. Growth in loans to the private sector stabilised at pre-pandemic levels and benefited from favourable financing conditions. Moreover, according to the euro area bank lending survey, credit standards remained broadly unchanged for loans to firms and tightened somewhat for housing loans in the third quarter of 2021, while demand for loans by firms and households continued to increase.

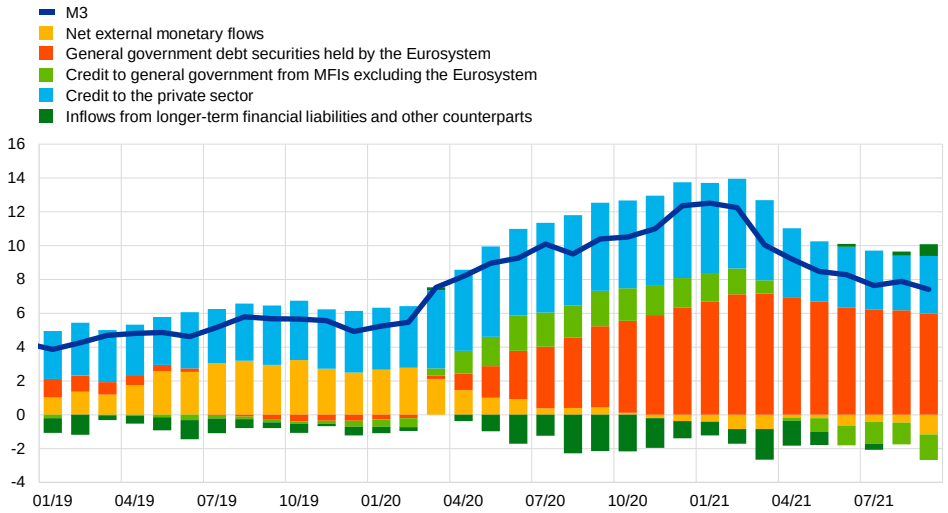
In September 2021 broad money growth moderated further. The annual growth rate of M3 declined to 7.4% in September, down from 7.9% in August (Chart 12), as it continued to be affected by negative base effects linked to the exceptional increase in liquidity between March and September 2020. The quarterly pace of money growth moved closer to its longer-term average, with shorter-run dynamics of M3 continuing to benefit from the significant support provided by monetary, fiscal and prudential policies. On the components side, the main driver of M3 growth was the narrow aggregate M1, which includes the most liquid components of M3. Having already started to moderate in the second quarter of 2021 from the high growth rates observed during the first year of the pandemic, the annual growth rate of M1 remained stable at 11.0% in September, mainly as a result of strong growth in overnight deposits. In the same month, although the contribution of other short-term deposits remained negative, notably owing to time deposits, marketable instruments continued to make a small contribution to annual M3 growth, reflecting the low level of interest rates and investors' search-for-yield behaviour.

Money creation continued to be driven by Eurosystem asset purchases. As in previous quarters, the largest contribution to M3 growth came from the Eurosystem's net purchases of government securities under the asset purchase programme (APP) and the pandemic emergency purchase programme (PEPP) (red portion of the bars in Chart 12). Further support for M3 growth came from credit to the private sector (blue portion of the bars). Bank credit to general government continued to make a negative contribution to money creation, owing to sales of government bonds and reduced issuance of government securities (light green portion of the bars). Net external monetary flows also had a slight negative impact on money creation, coinciding with a weakening of the effective euro exchange rate (yellow portion of the bars). However, other counterparts supported broad money growth (dark green portion of the bars), as favourable conditions for targeted longer-term refinancing operations provided incentives for the substitution of bank funding away from longer-term liabilities.

Chart 12

M3 and its counterparts

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

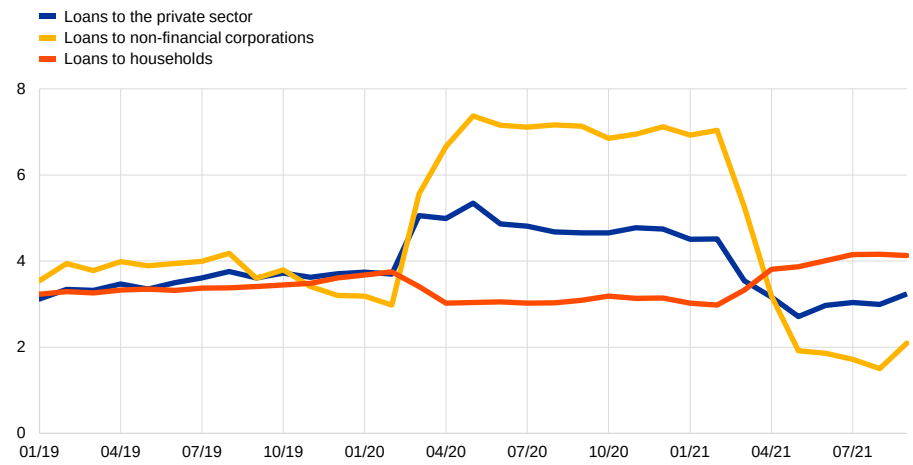


Source: ECB.
Notes: Credit to the private sector includes monetary financial institution (MFI) loans to the private sector and MFI holdings of securities issued by the euro area private non-MFI sector. As such, it also covers the Eurosystem's purchases of non-MFI debt securities under the corporate sector purchase programme and the PEPP. The latest observations are for September 2021.

Loan growth to the private sector increased in September 2021. Lending to firms and households continued to benefit from favourable financing conditions and the ongoing economic recovery. Loan growth to the private sector rose to 3.2% in September, up from 3.0% in August, driven by lending to firms and reflecting a positive base effect (Chart 13). The annual growth rate of loans to firms reached 2.1% in September, up from 1.5% in August, supported by a rise in longer-term loans. Despite that increase, the high cash balances and the availability of other non-bank funding sources might still weigh on firms' demand for bank loans. At the same time, the growth rate of loans to households edged down slightly to 4.1% in September (Chart 13). The growth in household borrowing was due mainly to a rise in mortgage lending, as consumer credit growth remained weak. This is attributable to the fact that the recovery has become less credit intensive, with households instead tending to finance their consumption with their disposable income and savings accumulated during the pandemic. Overall, loan developments are masking considerable differences across euro area countries, which, among other things, is a reflection of the uneven impact of the pandemic and progress of the economic recovery across countries.

Chart 13
Loans to the private sector

(annual percentage changes)



Source: ECB.
Notes: Loans are adjusted for loan sales, securitisation and notional cash pooling. The latest observations are for September 2021.

According to the October 2021 euro area bank lending survey**, credit standards for loans to firms and to consumers remained broadly unchanged, while those for housing loans tightened somewhat in the third quarter of 2021 (Chart 14).** Following a strong tightening in the earlier stages of the pandemic, credit standards for loans to firms remained broadly unchanged for the second consecutive quarter. This reflects an overall improvement in the euro area economy as containment measures have been gradually lifted and monetary, fiscal and supervisory authorities continue to provide support. Banks reported that risk perceptions and competition from other banks had had a slight net easing impact on credit standards, while banks' cost of funds and balance sheet constraints had had a broadly neutral impact, owing to banks' solid capital ratios and favourable funding costs. For housing loans, the net tightening of credit standards was related to banks' risk tolerance and their cost of funds and balance sheet constraints, whereas these factors had a broadly neutral impact on consumer credit. For the fourth quarter of 2021, euro area banks expect a moderate net tightening of credit standards for loans to firms and a further tightening of credit standards for loans to households for house purchase.

The survey shows that demand for loans continued to increase in the third quarter of 2021, albeit more among households than firms. This increase is attributable to improved consumer confidence, the historically low level of interest rates and housing market prospects. Banks also indicated that firms' financing needs for both fixed investment and inventories and working capital had contributed positively to loan demand. For the fourth quarter of 2021, banks expect a further rise in demand for loans by firms and no change in demand for loans by households for house purchase.

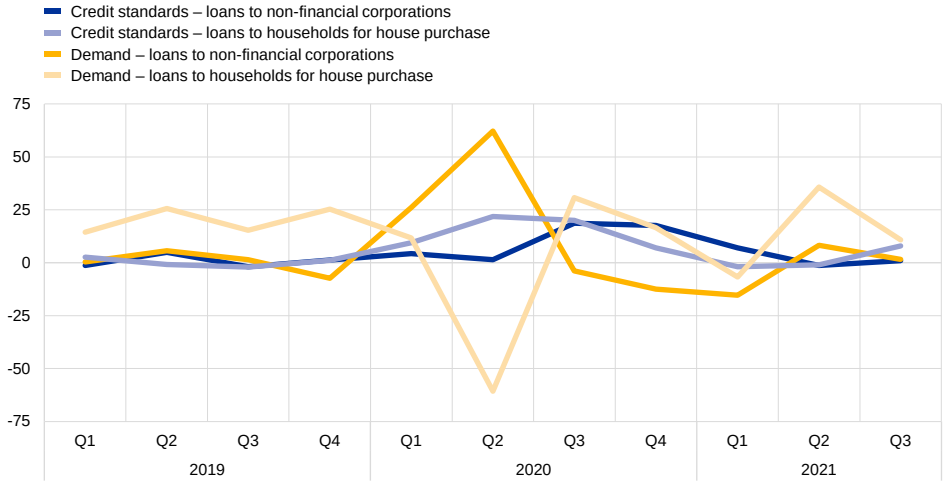
The survey also suggests that, on balance, the ECB's unconventional monetary policy measures supported banks' credit intermediation activities. Banks indicated that the ECB's asset purchase programmes (APP and PEPP), along with the third series of targeted longer-term refinancing operations (TLTRO III) had

had a positive impact on their liquidity position and market financing conditions. Furthermore, together with the negative deposit facility rate, banks reported that these measures had had an easing impact on bank lending conditions and a positive impact on lending volumes. At the same time, banks suggested that the ECB's asset purchases and the negative deposit facility rate had had a negative impact on their net interest income, while a large percentage of banks reported that the TLTRO III operations and the two-tier system had supported bank profitability.

Chart 14

Changes in credit standards and net demand for loans (or credit lines) to enterprises and households for house purchase

(net percentages of banks reporting a tightening of credit standards or an increase in loan demand)



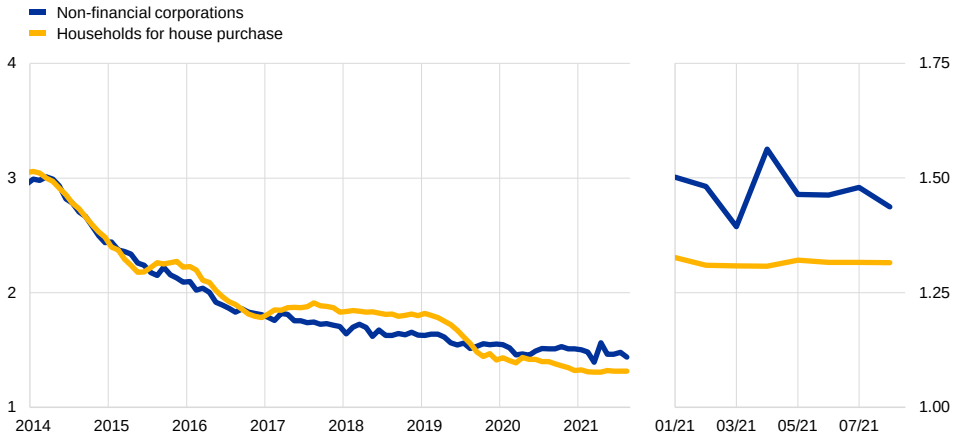
Source: Euro area bank lending survey.
Notes: For the bank lending survey questions on credit standards, "net percentages" are defined as the difference between the sum of the percentages of banks responding "tightened considerably" or "tightened somewhat" and the sum of the percentages of banks responding "eased somewhat" or "eased considerably". For the survey questions on demand for loans, "net percentages" are defined as the difference between the sum of the percentages of banks responding "increased considerably" or "increased somewhat" and the sum of the percentages of banks responding "decreased somewhat" or "decreased considerably". The latest observations are for the third quarter of 2021.

Bank lending rates have stabilised close to their historical lows. In August 2021 the composite bank lending rate fell slightly, to 1.44%, for loans to non-financial corporations and remained broadly unchanged, at 1.32%, for loans to households for house purchase (Chart 15). The decline in lending rates to firms was widespread across euro area countries. Moreover, the spread between bank lending rates on very small loans and those on large loans remained stable at low levels, mainly reflecting declines in rates on very small loans. There is still considerable uncertainty regarding the longer-term economic consequences of the pandemic, but policy support measures have prevented a broad-based tightening of financing conditions, which would have amplified the adverse impact it has had on the euro area economy.

Chart 15

Composite bank lending rates for non-financial corporations 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 observations are for August 2021.

Boxes

1 Scarring effects of the COVID-19 pandemic on the global economy – reviewing recent evidence

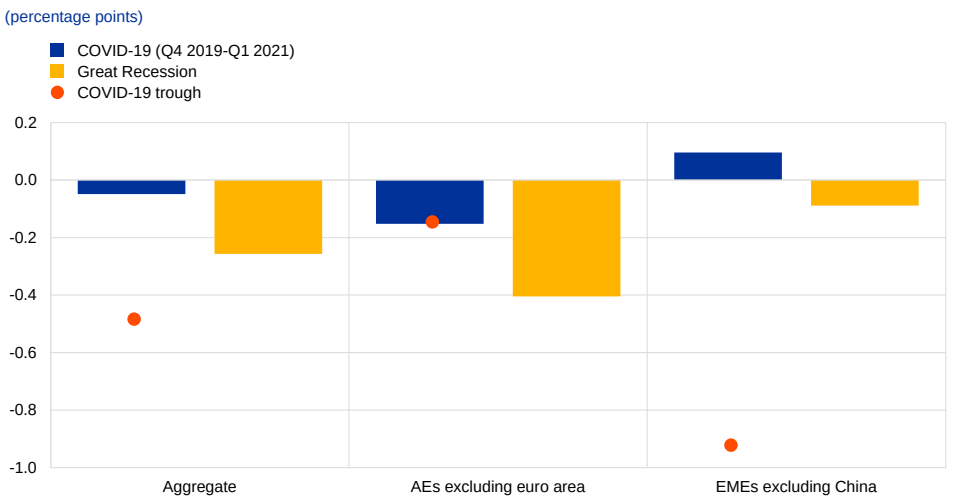
Prepared by Julia Doleschel and Ana-Simona Manu

The recession caused by the coronavirus (COVID-19) pandemic weighed on potential output across advanced economies and emerging market economies, but whether it will have a temporary or lasting impact remains to be seen. Taking a production function approach perspective, the decline in potential output can be explained by (i) smaller contributions from production factors (employment and capital), and/or (ii) lower technological gains (i.e. the efficiency with which inputs are combined). Although strong policy responses, particularly in advanced economies, cushioned the overall economic impact of the COVID-19 pandemic, there is still a risk of long-term output scarring. This relates, for instance, to hysteresis effects, as many workers have been at least temporarily excluded from the labour market, potentially resulting in skills losses and/or a permanent exit. While job retention schemes during the pandemic preserved employment and shielded productive but fragile firms, they might have partly hindered labour reallocation and hampered productivity. This box reviews evidence on the scarring effects of the COVID-19 shock and compares recent data relevant for determining the evolution of potential output with developments in the aftermath of the Great Recession.

The falloff in global investment stemming from the COVID-19 shock was short-lived and led to a slower accumulation of physical capital stock, although this was less pronounced than during the Great Recession. The surge in uncertainty regarding the economic outlook coupled with lockdown measures led to a reduction in new investment. In the first two quarters of 2020, world (excluding euro area) gross fixed capital formation declined by around 10% compared with the last quarter of 2019. This led to a slowing of aggregate growth in capital stock by 0.5 percentage points, although this was largely recovered in subsequent quarters (Chart A). By comparison, the Great Recession saw a much greater cumulative decline in global capital accumulation, although it occurred at a slower pace.

Chart A

Cumulative change in capital input



Sources: National sources and ECB calculations.
Notes: The blue bars refer to the change between the fourth quarter of 2019 and the first quarter of 2021, while the red diamonds depict the change between the fourth quarter of 2019 and the trough in the second quarter of 2020. The yellow bars refer to the change between the average for the period 2005-07 and the average for the period 2008-10. Advanced economies (AEs) include Canada, Japan, the United Kingdom and the United States. Emerging market economies (EMEs) include Brazil, India, Mexico, Russia, Turkey and South Korea.

By contrast, the contraction in hours worked during the pandemic was much stronger than during the Great Recession owing to both larger employment losses and reduced working hours per employee. Widespread lockdown measures prevented individuals from working as businesses closed or reduced operations, while school-related closures increased the need for childcare at home. In 2020 aggregate working hours declined by 8% compared with 2019, approximately 2.5 times more than during the Great Recession. This was due to a decline of equal proportion in employment and number of hours worked per employee.[1] The labour market deterioration was widespread across countries, but somewhat more pronounced in emerging market economies. By comparison, during the Great Recession, the reduction in total hours worked occurred mostly as a result of employment losses and was larger in advanced economies (Chart B). As the recovery takes hold, unemployed and marginally attached[2] workers are partly reabsorbed into employment, as indicated by the decline in the unemployment rate and the rise in the participation rate (Chart C).

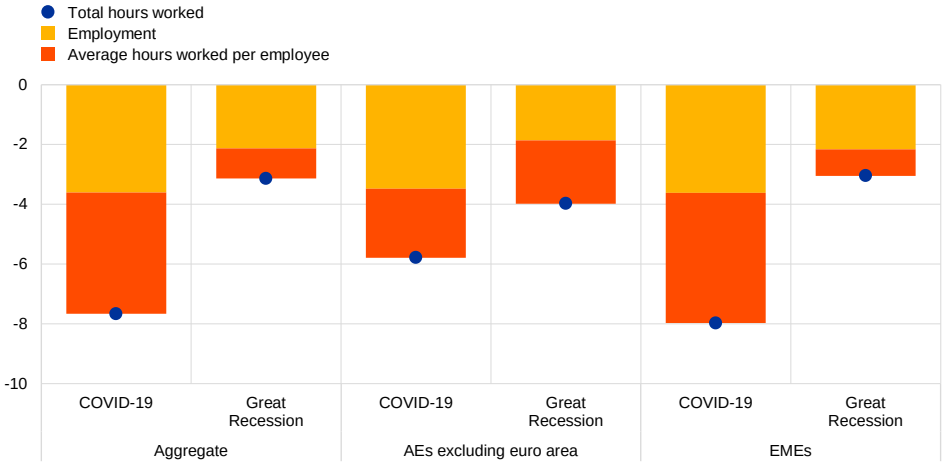
1 In order to isolate changes in hours worked from demographic trends, the preferred measure is the total number of hours worked over the year divided by the working age population. For emerging market economies, this figure was already on a downward path prior to the Great Recession, implying a larger reduction in working hours during the reference period shown in the chart for the Great Recession compared with the decline that occurred between 2009 and 2008 only.

2 The US Bureau of Labor Statistics defines marginally attached workers as “persons who are not in the labor force, want and are available for work, and had looked for a job sometime in the prior 12 months. They are not counted as unemployed because they had not searched for work in the prior 4 weeks, for any reason whatsoever. The marginally attached are a group that includes discouraged workers.”

Chart B

Changes in total hours worked

(percentage changes; percentage point contributions)



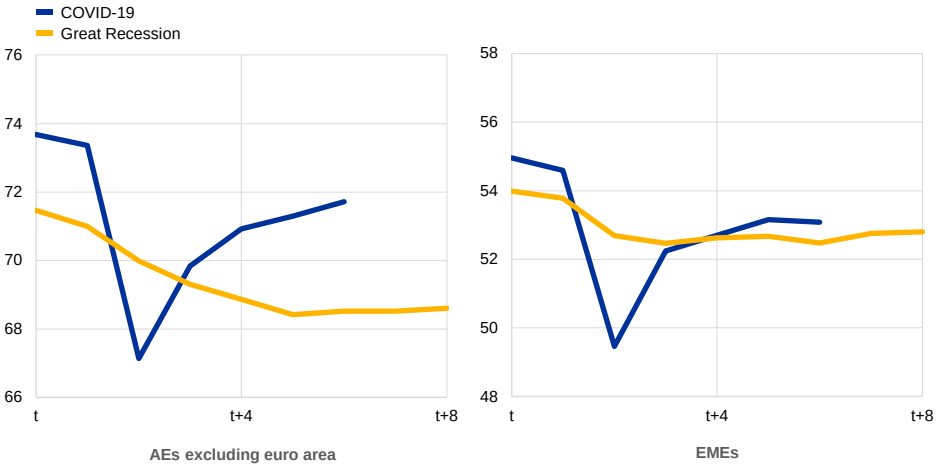
Sources: The Conference Board, World Bank and ECB calculations.
Notes: In order to isolate changes in hours worked from demographic trends, the measure used is the total number of hours worked over the year divided by the working age population. COVID-19 refers to the change between 2019 and 2020, while the Great Recession refers to the change between the average for the period 2005-07 and the average for the period 2008-10. Advanced economies (AEs) include Australia, Canada, Denmark, Japan, Norway, New Zealand, Sweden the United Kingdom and the United States. Emerging market economies (EMEs) include Brazil, China. India, Mexico, Russia, South Korea and Turkey.

Chart C

Labour market developments

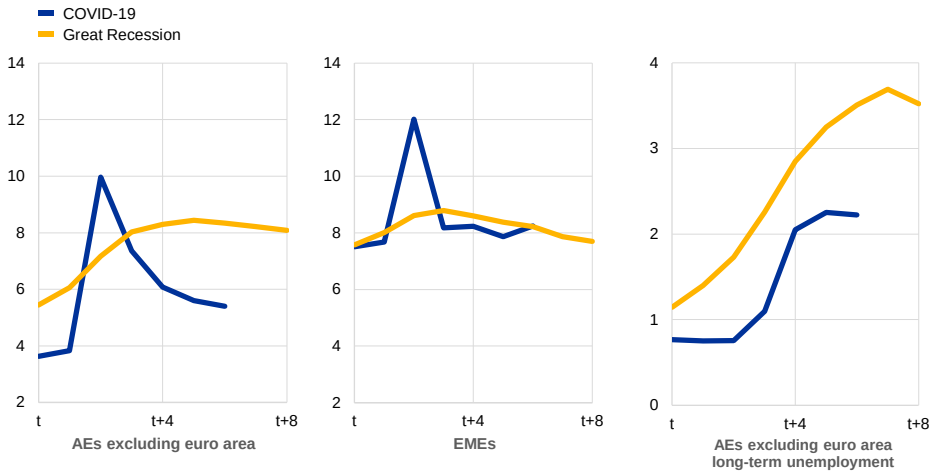
a) Employment rate

(percentages of working age population)



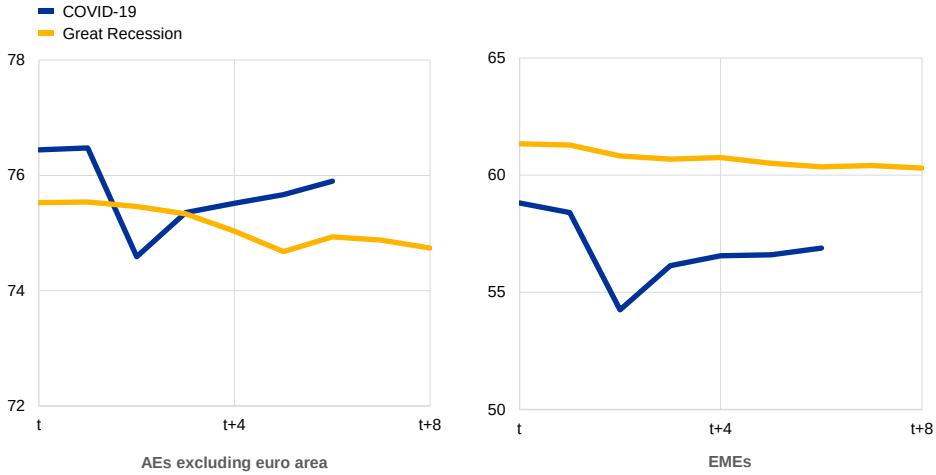
b) Actual and long-term unemployment rate

(percentages of labour force aged 15-64)



c) Labour force participation rate

(percentages of labour force aged 15-64)



Sources: National sources, Organisation for Economic Co-operation and Development and ECB calculations.
Notes: t=Q4 2019 for COVID-19 and Q3 2008 for the Great Recession. The advanced economies (AEs) aggregate is calculated as the weighted average across Australia, Canada, Denmark, Switzerland, Japan, New Zealand, Norway, Sweden, the United Kingdom and the United States (Australia, Canada, Switzerland, the United Kingdom and the United States for long-term unemployment). The emerging market economies (EMEs) aggregate includes Brazil, India, Mexico, Turkey, Russia and South Korea. Long-term unemployment is defined as being unemployed for 12 months or more (over 27 weeks for the United States). For Brazil and India, data refer to the labour force participation rate for all ages. The latest observations refer to the second quarter of 2021.

The weakness in the labour market translates partly into lower potential employment. People who entered early retirement schemes or left the labour market to meet childcare needs (i.e. who are interested in working, but not searching for work) are considered to lower the potential labour force participation rate and thus potential employment. This effect is likely to be temporary, at least in part, and to last until schools re-open fully, which will release parents from childminding, allowing them to re-integrate into the labour market.[3] Because mothers, in particular of younger children, were more prone to take over childcare responsibilities, the impact on potential employment is likely to be driven by a decline in labour force

[3] See, for example, Furman, J., Kearney, M.S. and Powell III, W., "The role of childcare challenges in the US jobs market recovery during the COVID-19 pandemic", *NBER Working Paper,* No 28934, June 2021; Bauer, L., "Mothers are being left behind in the economic recovery from COVID-19", Up Front, Brookings Institution, 6 May 2021; International Labour Organisation, "Fallout of COVID-19: Working moms are being squeezed out of the labour force", 27 November 2020.

participation by women. Where available, data suggest that the decline in labour force participation of mothers contributed by around 20% to the decline of total prime-age labour force participation.[4] At the same time, recessions can incentivise people to prolong their education or return to education for some years as a preferred alternative to being underemployed or unemployed. This would add downward pressure on labour force participation in the short term but raise productivity in the longer term.

Lasting damage to the labour market may arise from hysteresis effects if people remain out of work for longer, loose their skills or become discouraged. This phenomenon is likely to be concentrated in the hardest hit industries (for example, contact-intensive industries). However, strategic investment directed towards sectors that exhibited stronger bottlenecks coupled with the fact that some sectors are likely to expand as a result of new opportunities for business created by the recession (for example, chemicals, pharmaceuticals and logistics) could mitigate such adverse effects. Long-term unemployment in advanced economies increased by around 1.5 percentage points, which is less than during the Great Recession (Chart C, panel b). To the extent that the increase in long-term unemployment translates into a higher rate of structural unemployment[5] and participation rates do not fully recover, lower labour input is likely to remain a long-term drag on potential output going forward.

Total factor productivity (TFP) has also been suppressed by the COVID-19 shock, although its "residual" nature and inherited cyclicality requires cautious interpretation. In 2020 aggregate trend TFP growth fell by 0.2 percentage points compared with 2019, a decline similar to that seen during the Great Recession (Chart D).[6] Despite the significant uncertainty related to quantification of this unobserved variable, the balance of economic arguments suggests that the pandemic impaired the global efficiency of combining factors of production. Lower productive efficiency could be related to a less dynamic entry of new firms, amid heightened uncertainty about the economic environment and limited exit of inefficient firms in view of generous policy support. Moreover, supply chain disruptions increasingly lead to a less efficient reallocation of resources. Adjustments to the new remote working systems are also costly. On the positive side, progress with automation and digitalisation could improve efficiency, but such effects are likely to take longer to materialise fully.

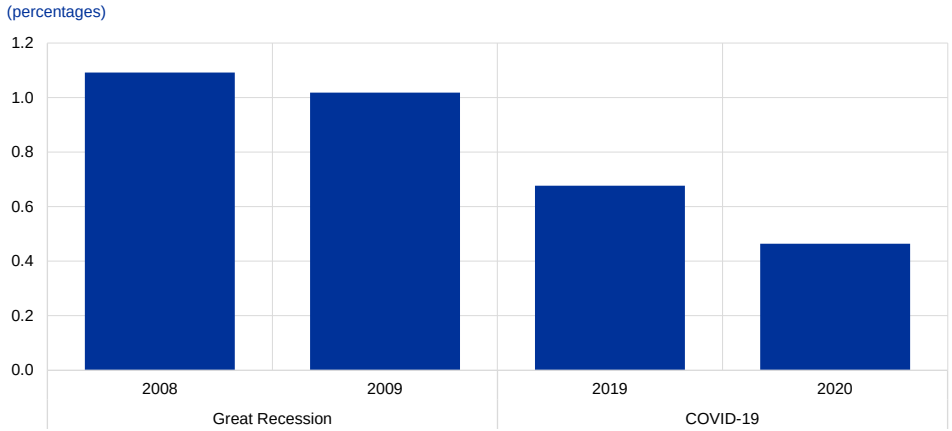
4 Despite a generally lower level of participation rates. See, for example, the ILO-UN Women study, which found that, based on data for 84 countries, the labour force participation rate of prime-age men is 95%, while prime-age women have a labour force participation rate of 52%.

5 As measured by the non-accelerating inflation rate of unemployment (NAIRU).

6 See Box 4 of this issue of the Economic Bulletin for a description of euro area developments in labour productivity during the COVID-19 pandemic.

Chart D

Trend total factor productivity growth



Sources: National sources and ECB calculations.
Notes: The global trend for TFP growth is computed by aggregating the trend TFP growth rates across nine economies (Brazil, China, India, Japan, Mexico, Russia, South Korea, Turkey and the United States) using GDP PPP weights. The country-specific trend TFP growth rates are obtained using a standard Cobb-Douglas Production Function Approach.

Overall, the level of global potential output has declined during the pandemic, albeit less than during the Great Recession and mostly on account of temporary factors. While investment was impaired, the drop was rather short-lived. Furthermore, the weakness in labour markets temporarily lowered potential employment and there are indications that TFP growth declined. Looking ahead, the prospects for global potential output depend on the adjustment to the post-pandemic economic landscape and, importantly, on the phasing-out of policy support measures. Far-reaching monetary and fiscal policy stimulus helped avert a wave of bankruptcies and mass unemployment. Accordingly, a premature withdrawal of policy support could be costly and hamper the economy's potential output (for example via inefficient bankruptcies[7] and capital retirement).Employing the right mix of labour market policies will be key to promoting an equitable and sustained recovery from the COVID-19 crisis and will help workers avoid becoming permanently detached from the labour market.

7 See, for example, Financial Stability Board, "COVID-19 support measures: Extending, amending and ending", 2021.

2 Main findings from the ECB's recent contacts with non-financial companies

Prepared by Gabe de Bondt, Friderike Kuik and Richard Morris

This box summarises the results of contacts between ECB staff and representatives of 68 leading non-financial companies operating in the euro area. The exchanges mainly took place between 4 and 13 October 2021.[1]

Contacts reported strong growth in activity overall, but many said that supply constraints were increasingly limiting their ability to meet demand. Manufacturers described healthy order books and long delivery times, but shortages of inputs made it difficult for production to keep pace with orders. The acute shortage of semiconductors continued, and the spread of the Delta variant of the coronavirus (COVID-19) in Asia had further affected chip supplies. This resulted in a sharp drop in automotive production and in demand for related intermediate inputs. By contrast, contacts reported growing demand for many non-durable consumer goods and continuing robust demand for household durables, in turn sustaining demand for most intermediate goods. Faced with strong order books, most contacts said that manufacturing activity was being hampered by shortages of materials and components, also related to congestion at container shipping ports. Activity in the construction sector was also hindered by shortages of materials and labour, despite strong or recovering demand for both residential and non-residential investment. Developments in retail and transport services reflected the continued strong demand for manufactured goods. Contacts elsewhere in the services sector generally reported steady or robust growth in activity. Leisure travel, hospitality and recreation services had recovered quite strongly over the summer, but activity in these sectors remained markedly below pre-pandemic levels. Demand for IT and telecommunications services remained solid, while media and advertising services were steadily recovering from pandemic-induced lows.

Looking ahead, most contacts were optimistic about the outlook for activity in the fourth quarter of 2021 and beyond. Strong order books would sustain the output of manufacturers for a number of months or quarters, while the further loosening of travel restrictions would give an added boost to related services industries. The recent rise in energy prices was, however, creating additional uncertainty regarding production in energy-intensive industries. Moreover, higher inflation could subdue real disposable income and final consumer demand. Supply chain disruption was likely to persist for several months before gradually easing in the course of 2022, while more substantial capacity investments would take effect in 2023.

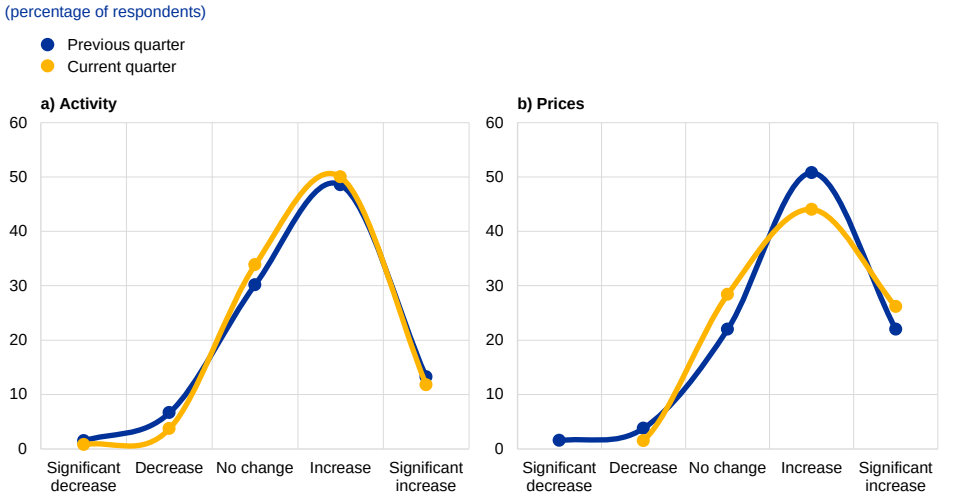
Contacts reported growing employment but also an increasing lack of available labour and high attrition, resulting in many unfilled positions. Numerous companies observed a scarcity of applicants, which acutely affected

[1] For further information on the nature and purpose of these contacts, see the article entitled "The ECB's dialogue with non-financial companies", *Economic Bulletin*, Issue 1, ECB, 2021.

those firms seeking to hire or rehire on a large scale. This was attributed to people moving to jobs in other industries, returning to their home countries (in the case of foreign workers) or adjusting their work-life balance – factors that could persist to varying degrees. There were also structural drivers related to job preferences and ageing. Pent-up demand to change jobs together with reduced geographical limitations (owing to home working) also led to higher attrition rates. Not only were some long-standing shortages (such as of software engineers and lorry drivers) becoming more acute, but shortages were also increasingly observed across a range of professions, albeit to differing degrees across geographical areas.

Chart A

Summary of views on developments in and the outlook for activity and prices



Source: ECB.
Notes: The scores for the previous quarter reflect the ECB staff assessment of what contacts said about developments in activity (sales, production and orders) and prices in the third quarter of 2021. The scores for the current quarter reflect the assessment of what contacts said about the outlook for activity and prices in the fourth quarter of 2021.

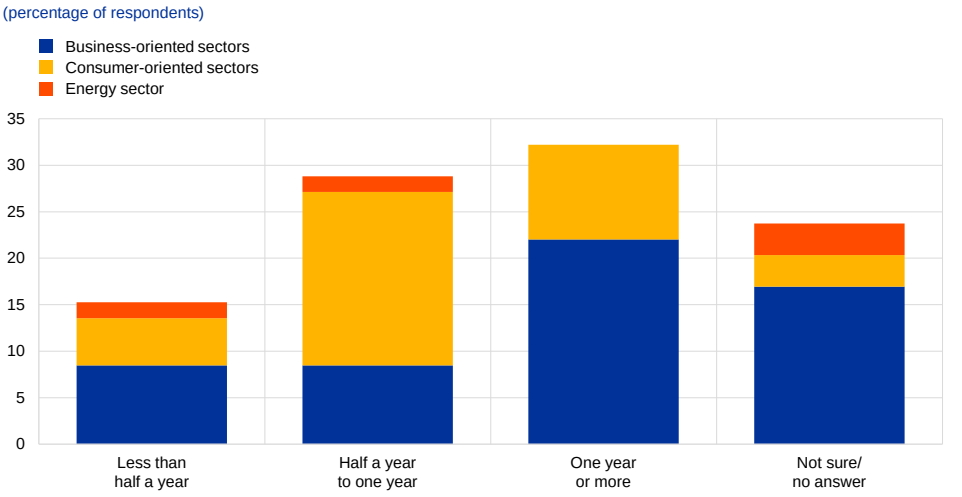
Contacts in the industrial sector reported significant increases in selling prices, while price developments in the services sector were less dynamic. This was not dissimilar to the situation described three months earlier, in which many input and selling prices were already rising at the fastest rate seen for many years. However, the persistence of the high or rising input costs, together with the recent surge in energy prices, did lead many contacts to raise their price expectations for next year and to anticipate a stronger pass-through to consumer prices. In particular, most contacts in business-oriented sectors described a favourable environment for passing higher costs on to their customers, given the latter's focus on securing supply, and many anticipated a significant further pass-through to consumers. At the same time, many of the contacts in more consumer-oriented sectors considered that strong competition among retailers and from online merchants would limit the pass-through to final consumer prices.

Industrial input prices were still expected to ease at some point in 2022, but contacts expected wage inflation to pick up. The prices of some commodities had already peaked towards the middle of this year, and while the prices of others were still increasing, most contacts still expected these to stabilise or ease in the coming

quarters. However, the transmission of pipeline pressures through the value chain would persist for some time. If not reversed, the recent surge in gas and electricity prices would further add to costs next year as contracts are rolled over. Most contacts anticipated higher wage increases in upcoming wage negotiations, broadly mirroring the recent pick-up in consumer prices. Besides pressure to sustain real incomes, wage negotiations would reflect improved business profits (in some cases reflected in bonuses rather than wages), a certain degree of catch-up in cases where wages had been restrained during the pandemic, and tighter labour market conditions. However, for some contacts the main concern was not negotiated wage increases but the higher wages that needed to be offered to attract new staff.

Chart B

Summary of views on the persistence of supply constraints and input price pressures

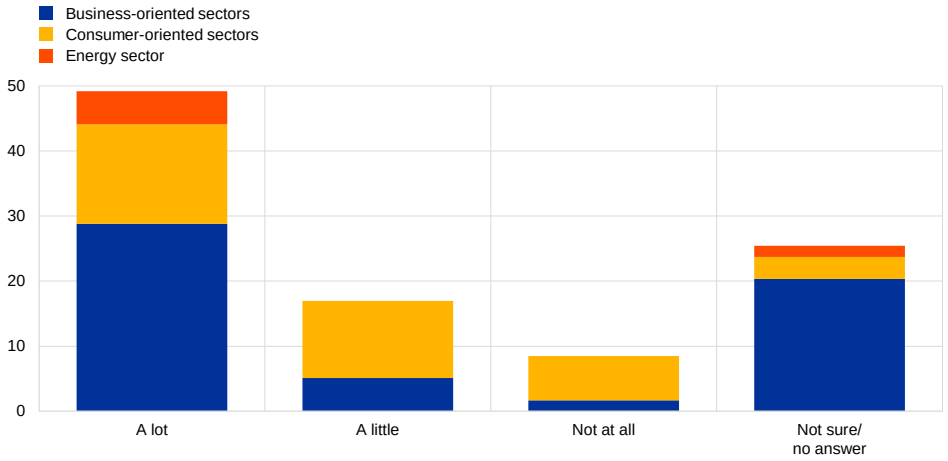


Source: ECB.
Notes: The chart presents the ECB staff interpretation of what contacts said about the likely duration of the supply constraints and input price pressures currently faced by their industry, including those related to the scarcity of inputs, transport delays, energy costs and labour shortages. The views are expressed as a percentage of the respondents who said that their firm or industry was experiencing supply constraints and/or input price pressures. Business-oriented sectors comprise intermediate and capital goods, construction, transport and business services. Consumer-oriented sectors comprise consumer goods (including food), retail and consumer services.

Chart C

Summary of views on the extent to which current cost pressures will be passed through to consumer prices

(percentage of respondents)



Source: ECB.
Notes: The chart presents the ECB staff interpretation of what contacts said about the extent to which the unusual cost pressures that they were facing would be passed through to consumer prices. The views are expressed as a percentage of the respondents who said that their firm or industry was experiencing supply constraints and/or input price pressures. Business-oriented sectors comprise intermediate and capital goods, construction, transport and business services. Consumer-oriented sectors comprise consumer goods (including food), retail and consumer services.

3 Labour supply developments in the euro area during the COVID-19 pandemic

Prepared by Katalin Bodnár and Derry O'Brien

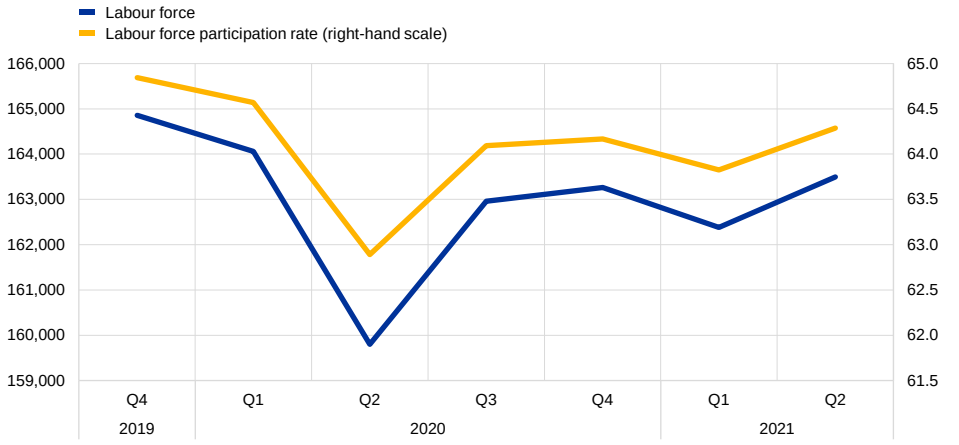
In this box we look at what has contributed to the evolution of labour force participation during the pandemic, as well as its outlook. This is relevant from a policy perspective as a depressed participation rate over a prolonged period could point to scarring effects in the labour market, whereas a continued recovery may help to address existing labour shortages, contain emerging wage pressures and support the economic recovery overall.

Labour supply in the euro area remains adversely affected by the pandemic. The labour force participation rate, one of the main indicators of labour supply, in the euro area was 64.3% in the second quarter of 2021, up from its low of 62.9% in the second quarter of 2020 (Chart A).[1] But it was still about 0.6 percentage points below its pre-pandemic level in the fourth quarter of 2019, corresponding to roughly 1.4 million fewer workers in the labour force.[2] More recent but still preliminary monthly unemployment data for July and August suggest that the labour force recovered slightly in the third quarter of 2021.

Chart A

Labour supply in the euro area

(thousands; percentage of working age population)



Sources: Eurostat Integrated European Social Statistics and ECB staff calculations.

Recent labour force developments have tended to partly mirror the stringency of pandemic containment measures. Across the euro area, the numbers in the

1 In this box the terms "labour supply" and "labour force" are used interchangeably. The labour force is the sum of workers who are either employed or unemployed (and aged between 15 and 74). The labour force participation rate is calculated as the ratio between the labour force and the working age population (those aged between 15 and 74).

2 These data should be interpreted with some caution as they may be subject to larger than usual revisions related to the ongoing implementation of the Integrated European Social Statistics (IESS) Directive.

labour force fell sharply in the second quarter of 2020 (Chart B), predominantly due to declines in employment as the number of workers in unemployment decreased only marginally. However, the widespread support from job retention schemes is likely to have stemmed flows from employment into inactivity, preventing a much larger decline in the labour force. Some easing in the stringency of the containment measures in the third quarter of 2020 saw a quick but partial rebound in the labour force, although this was partly driven by an increase in unemployed workers. The stringency of containment measures subsequently continued to be mirrored somewhat in movements in the labour force, explaining a temporary further dip in the labour force numbers in the first quarter of 2021. These labour force developments were closely aligned with opposite movements in the numbers of discouraged workers, i.e. those who are available to work but are not seeking a job (e.g. because they think they would not find one) and are thus considered to be inactive. Such a close alignment of labour force and discouraged workers runs contrary to the pre-pandemic pattern and may be partly explained by the fact that the working age population remained broadly unchanged during the pandemic, whereas it had been increasing before then. Already before the pandemic, the growth of the working age population was projected to slow down because of population ageing, as the cohorts entering working age are smaller than the cohorts leaving it. [3] Net immigration to the euro area was expected to counterbalance this and keep the working age population increasing. However, based on the statistics on population by citizenship, the foreign population in the euro area has stopped increasing since the start of the pandemic crisis, while it was rising before. While limitations to statistics make it challenging to assess how migration was affected, there is some evidence that some foreign workers returned to their home countries.[4] As a result of a moderation in net immigration, the working age population flattened out in the last quarters.

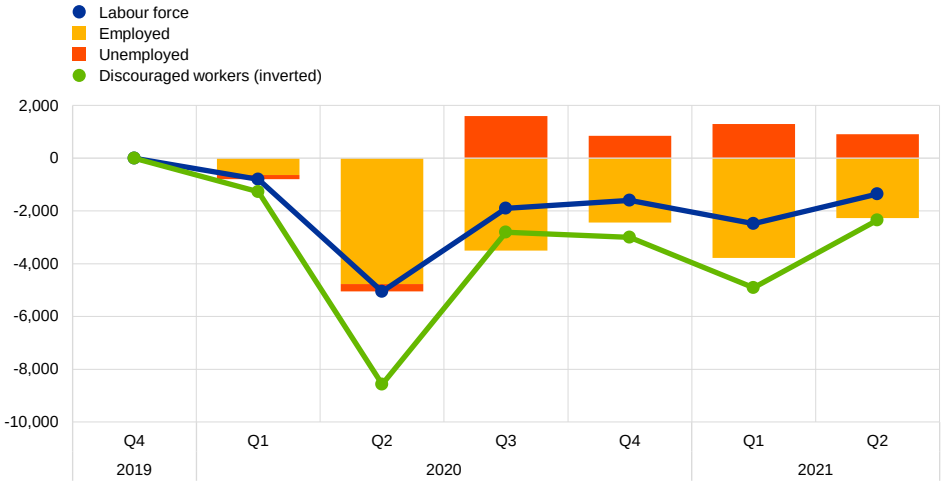
[3] See "'The macroeconomic and fiscal impact of population ageing", Box 1 in "Evolution of the ECB's analytical framework", *Occasional Paper Series*, No 277, European Central Bank, September 2021.

[4] See the box entitled "Main findings from the ECB's recent contacts with non-financial companies" in this issue of the Economic Bulletin and "International Migration Outlook 2021", OECD, 2021

Chart B

Labour force and discouraged workers in the euro area

(thousands, cumulative change since the fourth quarter of 2019)



Sources: Eurostat Integrated European Social Statistics and ECB staff calculations. Note: Series are seasonally adjusted.

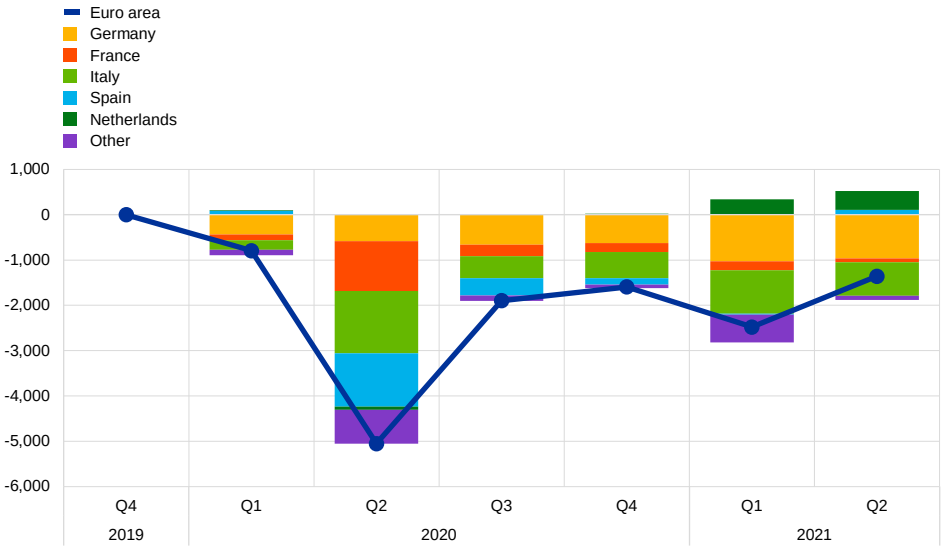
Developments in labour supply have been quite heterogeneous across larger euro area countries during the pandemic. The number of workers in the labour force remains well below pre-pandemic levels in Germany and Italy; it is close to pre-pandemic levels in France and Spain and is noticeably higher in the Netherlands (Chart C). Such cross-country heterogeneity, which has also been reflected in the corresponding labour force participation rates, may reflect several factors. First, countries are at different stages of population ageing and the working age population is already decreasing in some countries (for example, Germany), while it is still increasing in others (for example, Spain). Second, the labour force participation rate differs considerably across demographic groups, meaning that a shift in the structure of the working age population can affect the aggregate labour force. The share of older cohorts has been rising in all euro area countries, but because of differences in levels across the shares of older (and other) cohorts in their populations, the impact of the rising trend on the labour force has been quite heterogeneous.[5] Finally, the impact of the pandemic on migrant workers and, in turn, on labour supply, was also heterogenous across countries.

5 For more details, see the article entitled "Labour supply and employment growth", *Economic Bulletin,* Issue 1, ECB, 2018.

Chart C

Labour force in the euro area and the largest euro area countries

(thousands, cumulative changes since the fourth quarter of 2019)



Sources: Eurostat Integrated European Social Statistics and ECB staff calculations.

Understanding how structural and cyclical drivers affect the labour force participation rate of the different demographic groups helps us to better assess the impact of the pandemic and prepare forecasts. The labour force participation rate of young workers and prime-age men showed the greatest correlation with the business cycle before the pandemic (Chart D, panel a). At the same time, the labour force participation rate of older workers and prime-age women was more independent from the business cycle. The labour force participation rate of those with a medium level of education strongly co-moved with GDP growth, whereas movements in the rates for those with higher and lower levels of education were less cyclical or a-cyclical. Structural drivers also differed. The labour force participation rate of older workers was trending upwards before the pandemic, reflecting their rising educational level and the effect of past pension reforms, among other factors.[6] At the same time, the labour force participation rate of prime-age women was also trending upwards, although less strongly.[7]

The coronavirus (COVID-19) shock affected some demographic groups' labour force participation rate differently from what past cyclicality would suggest. The assessment, however, depends on the counterfactual scenario used, i.e. the assumption of what would have happened in the absence of the pandemic shock. Using counterfactual scenarios that take the pre-pandemic trends into consideration, the labour force participation rate gap – i.e. the difference between the observed labour force participation and the no-pandemic-shock counterfactual – is the widest for older workers and for workers with lower and medium levels of education, respectively (Chart D, panel b). The apparently strong effect of the shock on the

6 For more details, see the article entitled "Drivers of rising labour force participation – the role of pension reforms", *Economic Bulletin,* Issue 5, ECB, 2020.

7 For more details, see the article entitled "Hours worked in the euro area", *Economic Bulletin*, Issue 6, ECB, 2021.

labour force participation rate of older workers is not in line with past cyclical patterns. This reflects the special nature of the shock. Fear of infection may be one of the factors behind the findings for older workers.[8] By contrast, younger workers' labour force participation rate may have benefited from labour shortages and less fear of infection at workplaces.[9]

[8] There is some evidence that in the United States, early retirement increased. See, for example, Faria-e-Castro, M. "The COVID Retirement Boom", Federal Reserve Bank of St. Louis, *Economic Synopses*, Number 25, 2021.

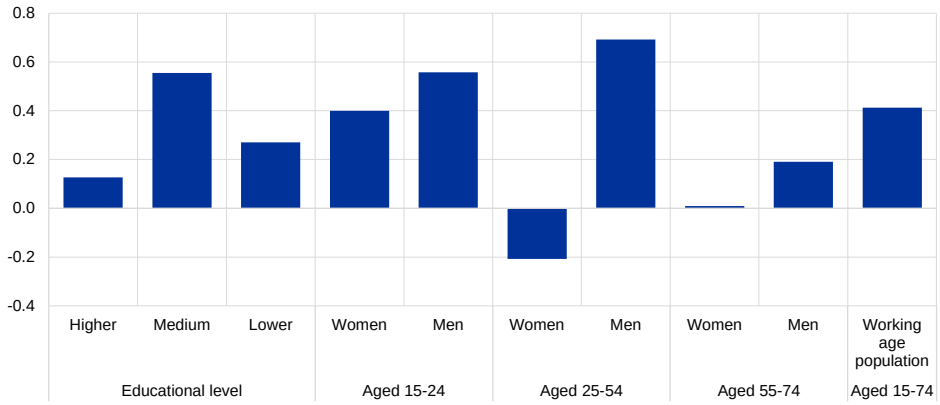
[9] Other aspects of heterogeneity may also be important, but an analysis of their role is subject to data constraints. One such aspect is the effect of the pandemic on immigration. Pre-pandemic increases in the labour force were strongly supported by immigration in some euro area countries. Net immigration flow may have slowed down, while some emigration may have occurred in the wake of the pandemic shock. However, data come with a time lag and are surrounded by a larger than usual uncertainty. Moreover, the effect on the labour force participation rate may be ambiguous.

Chart D

Cyclicality of the participation rate of different population groups, and the labour force participation gap in the second quarter of 2021

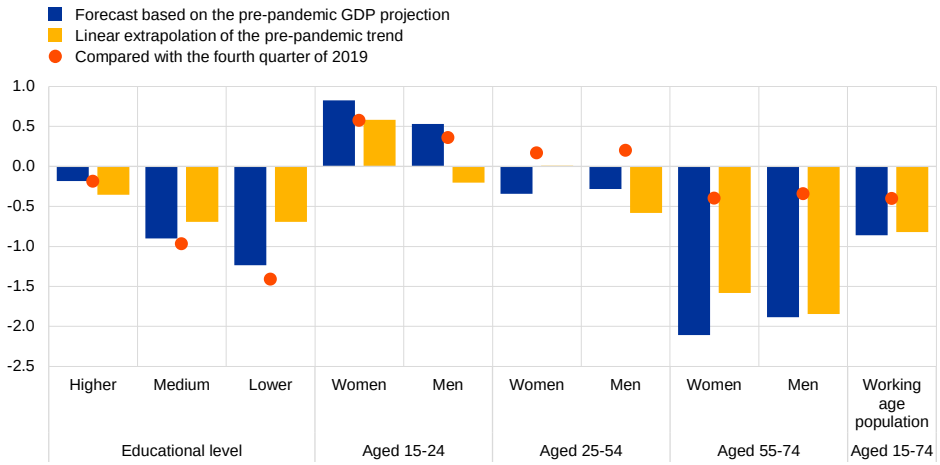
a) correlation of the cyclical part of the labour force participation rate with the output gap between the first quarter of 2000 and the last quarter of 2019[10]

(correlation coefficient)



b) gap between the labour force participation rate and different counterfactual scenarios

(percentage points)



Source: Eurostat and ECB staff calculations

Notes: On panel a, the correlation is calculated between the output gap and the one-quarter lagged value of the Hodrick-Prescott filtered value of the labour force participation rate for the period 2005-19. The output gap is calculated using the potential output estimates of the European Commission. The Hodrick-Prescott filter is applied to the labour force participation rate by age groups, disregarding the pandemic observations and using instead a counterfactual scenario for the years 2020-21, in order to mitigate end-point uncertainty and the impact of the pandemic shock on pre-pandemic trend due to smoothing. On panel b, the first counterfactual scenario is derived from regressions linking the change of the labour force participation rate to GDP growth and past levels of the labour force participation rate and forecasting the path using the pre-pandemic GDP projections (2019 December Broad Macroeconomic Projection Exercise).

Recovery to pre-pandemic levels of the labour force participation rate will take time, even if discouraged workers return quickly. Past crises have tended to weigh on the labour force participation rate over a prolonged period. After accounting for the upward trending behaviour in the labour force participation rate (Chart E), the current gap to pre-crisis dynamics is more evident and is estimated to be

[10] The correlation with the aggregate unemployment rate as an alternative business cycle indicator provides a very similar picture.

around -0.75 percentage points. This estimate is surrounded by some uncertainty.[11] It is not yet clear whether the pandemic affects the trend of the labour force participation rate and how big the scarring effects will be. The above estimations suggest that the groups that had made the largest contribution to the upward trend of the aggregate labour force participation rate before the pandemic are the main cause of that rate being below its counterfactual path. Should these changes persist, future increases in the labour force participation rate may be more limited than expected before the pandemic.

A gradual return of the aggregate labour force participation rate could also be seen as broadly consistent with past regularities. The high persistence tends to be mainly driven by the stickiness of non-market work activities. [12] This may be stronger if the pandemic, to a greater extent than past crises, has prompted workers to reassess their career goals and to learn new skills by returning to education. Discouraged workers can rejoin the labour force relatively quickly, but even if the number of discouraged workers returned to pre-pandemic norms, there would still be a shortfall. A recovery in the participation rate will also depend on the strength of the recovery in labour demand.

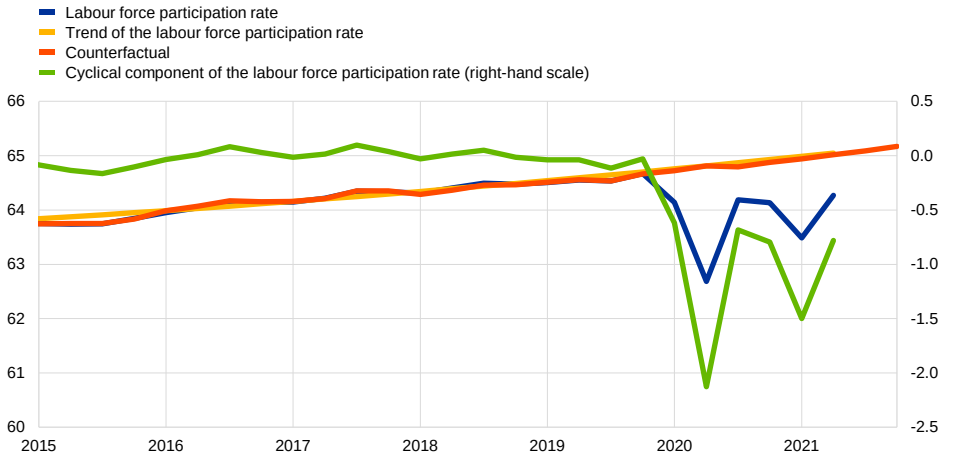
11 First, the data may be subject to larger than usual revisions due to the ongoing implementation of the IESS. Second, both the trend-cycle decomposition and the extrapolation embed some degree of uncertainty. Several alternative methods were tested to assess the robustness of the estimate for this gap. Given the persistence of the labour force participation developments, the estimate for the counterfactual is not very sensitive to the methodology used, and the estimated gap remains in the range of -0.7 to -0.9 percentage points.

12 For evidence on the role of non-market-work activities in driving the delayed cyclical recovery, see for example, for the United States, Cajner, T., Coglianese, J. and Montes, J., "The Long-Lived Cyclicality of the Labor Force Participation Rate", *Finance and Economics Discussion Series*, Board of Governors of the Federal Reserve System, No 2021-047, 2021; see also for 30 OECD countries, Duval, R., Eris, M. and Furceri, D., "The effects of downturns on labour force participation", *OECD Economics Department Working Papers*, No 875.I, 2011.

Chart E

Trend and cyclical component of the labour force participation rate

(percentage of working age population and percentage point deviation from trend)



Sources: Eurostat and ECB staff calculations.
Notes: The data refer to the 15-74 age group. The trend is derived using a Hodrick-Prescott filter (λ=1600), with forecast data for the post-2019 period included in the estimation sample to alleviate the end-of-sample issues and to exclude an effect of the pandemic on trend. The cyclical component is the deviation of the actual labour force participation rate and the Hodrick-Prescott filtered trend. The counterfactual is derived as an aggregation of the counterfactual paths of different population groups. The latter is derived from regressions linking the change in the labour force participation rate to GDP growth and past levels of the labour force participation rate, and forecasting the path using the pre-pandemic GDP projections (2019 December Broad Macroeconomic Projection Exercise). Eurostat population projections are used for the aggregation. The latest observations are for the second quarter of 2021.

4 The impact of the COVID-19 pandemic on labour productivity growth

Prepared by Paloma Lopez-Garcia and Bela Szörfi[1]

The growth of euro area labour productivity, measured by real GDP per hour worked, increased at the onset of the coronavirus (COVID-19) pandemic before declining in the course of the subsequent economic recovery. [2] This contradicts the general notion of productivity being procyclical and reflects the unique nature of this crisis.[3] This box discusses the recent patterns in labour productivity and considers the extent to which some of these developments might fade or consolidate after the crisis.

Between the last quarter of 2019 and the first quarter of 2021, euro area labour productivity growth remained positive and even accelerated compared with the period prior to the pandemic (Chart A). Average growth in annual real GDP per hour worked rose to 1.7% during this period, more than twice the average pre-pandemic (2014-19) rate, while real GDP and total hours worked declined by annual averages of 5.7% and 7.4% respectively. The fall in employment was much smaller, due mainly to the different job retention schemes set up in various euro area countries – on average, employment fell by an annual 1.6% over the same period. In the second quarter of 2021, however, these developments reversed, with hours worked and employment rebounding sharply, causing productivity growth to slow. Nevertheless, productivity is now more than 2% higher than the pre-pandemic level seen in the fourth quarter of 2019.

1 We would like to thank ECB colleagues Vasco Botelho, Rodrigo Barrela, Paul Reims and Charles Hoffreumon for their input.

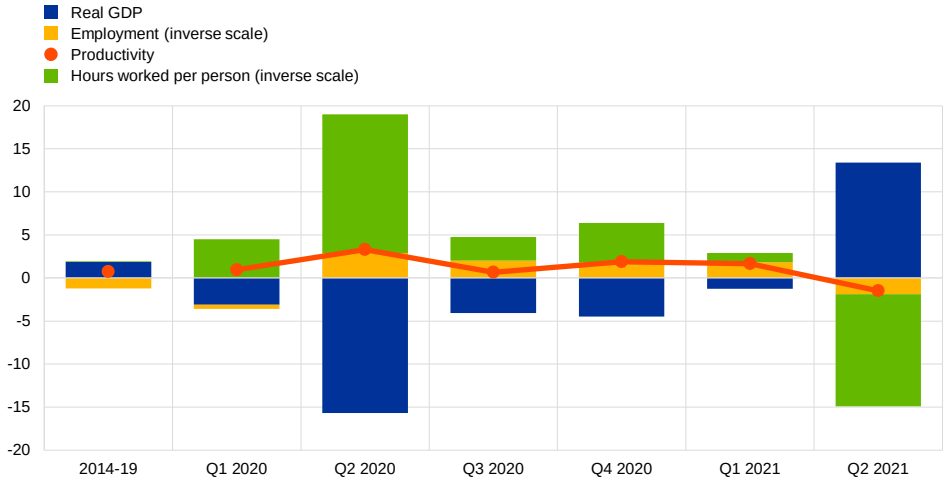
2 Total factor productivity (TFP) is another measure of productivity. Developments in TFP growth outside the euro area are discussed in Box 1.

3 A paper by Basu and Fernald, for instance, starts with the sentence: “Productivity rises in booms and falls in recessions.” See Basu, S. and Fernald, J., “Why Is Productivity Procyclical? Why Do We Care?”, *NBER Working Paper Series*, No 7940, October 2000.

Chart A

Real GDP per hour worked in the euro area

(year-on-year percentage changes)



Sources: Eurostat and ECB staff calculations

The pandemic and the associated containment measures have affected aggregate labour productivity growth in many different ways. The discussion in this box is organised by grouping the different channels into those with an impact on within-firm productivity growth and those with an impact on the reallocation of resources across firms within and across sectors of activity. Within-firm productivity growth depends on input quality, managerial practices, innovation and technology adoption. Resource reallocation results from the expansion or contraction of firms and from the process of creative destruction whereby new, productive firms displace obsolete ones. Reallocation can take place across sectors or within sectors.

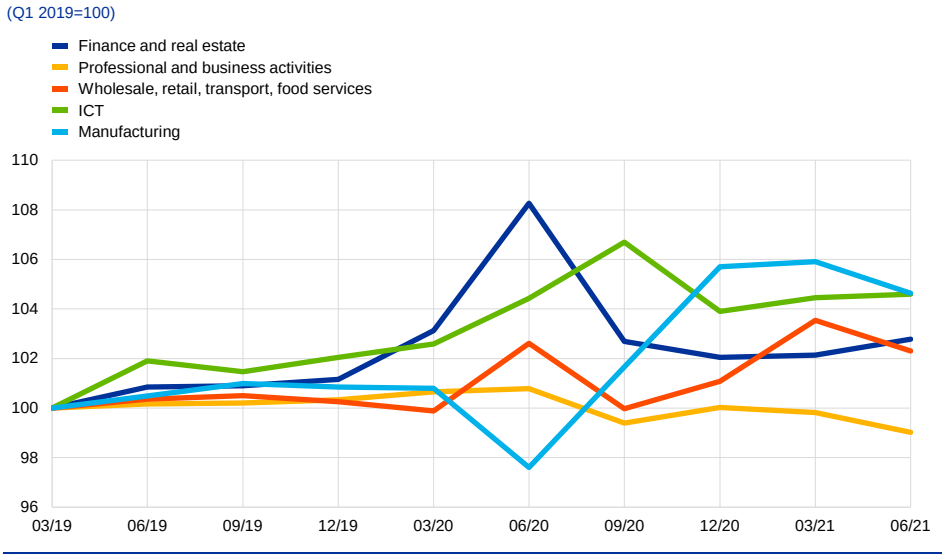
Within-firm productivity growth is benefiting from the acceleration in digital uptake brought about by the pandemic. Containment measures obliged firms to adjust quickly to remote working and establish new channels for sales and customer contact, which had an impact on their working and business arrangements. It can therefore be said that the pandemic has accelerated the trend for digitalisation that had already started well before the crisis. Chart B shows how productivity, measured as sector value added per hour worked, increased soon after the first wave of lockdowns in sectors such as information and communication (ICT) and finance, where staff could work remotely and firms could take advantage of new digital solutions. Some of those productivity gains were retained after the economies started to re-open. This was reinforced by events in manufacturing and in the wholesale, retail and accommodation sectors, where productivity gains started later but remained strong well into 2021. Survey-based evidence suggests that these sector-specific developments reflect rapid productivity gains from digital adoption, particularly in those firms and sectors that are relatively less technology-intensive.[4] Although part of the shift to remote working might reverse over time, some is likely to

[4] See Box 6 entitled "The long-term effects of the pandemic: insights from a survey of leading companies", *Economic Bulletin*, Issue 8, ECB, 2020.

persist, at least in some areas, and could potentially open the door to substantial gains in terms of productivity and employee well-being.[5]

Chart B

Real value added per hour worked, different sectors



Sources: Eurostat and ECB staff calculations
Note: The latest observation is for the second quarter of 2021.

Looking ahead, the pandemic might, however, also have a negative impact on within-firm productivity growth. An increase in firm exits as supporting policies are withdrawn could lead to the destruction of jobs, which could potentially lead to a deterioration of skills if the reallocation of displaced workers to other firms is slow. Human capital accumulation might also be affected by lockdown-induced interruptions to education and training. Supply chain disruption might persist, and firms might need to find new suppliers, new transport routes or new production locations. In addition, it will be important for favourable financial conditions to be maintained to make new productivity-enhancing projects viable and to prevent corporate debt overhangs, together with high uncertainty, weakening investment going forward.

The impact of the shock has been asymmetric, which has triggered a productivity-enhancing reallocation of resources across sectors, at least in the short run. The containment measures have had a major impact on service sectors relying on face-to-face interactions. These are, on average, relatively less productive than other less hard-hit sectors like manufacturing or technology-intensive sectors that have even benefited from the increased demand for online solutions. This redistribution of activity across sectors of varying productivity might serve to enhance productivity. A shift-share analysis using quarterly euro area data confirms that during the pandemic, the reallocation of resources across sectors has contributed

[5] The COVID-19 pandemic could also exacerbate the inequality between firms if only the most productive and largest companies adopt the latest digital technologies. The reason is that digital technologies are characterised by scalability, large fixed costs and low marginal costs, and benefit from network effects. See Haskel, J. and Westlake, S., *Capitalism without Capital: The Rise of the Intangible Economy*, Princeton University Press, Princeton, NJ, November 2017.

between 30 and 40% of aggregate productivity growth (Chart C, panel a).[6] This development contrasts sharply with the pre-crisis period when sector reallocation contributed little – and negatively – to aggregate productivity growth. Intra-sector developments in the areas least affected by the shock explain the rest of aggregate productivity growth. There are, however, two possible caveats looking ahead. First, it is not clear to what extent the contribution of sector reallocation will persist over time – the impact already seems to be declining in the second quarter of 2021, and this may accelerate as containment measures are gradually removed.[7] And second, reallocating jobs and capital across sectors is always harder, and takes longer, than within sectors, which might weigh on the recovery.

There are also signs that the creative destruction process could be productivity-enhancing. The exit of low-productivity firms is regarded as a silver lining in crises.[8] However, the exogenous and horizontal nature of this shock – affecting all firms in a given sector – was no guarantee that productivity-enhancing creative destruction would take place. Evidence shows that compared with other crises, exits have been muted as a result of the different policies supporting corporates enacted by governments.[9] But ECB simulations show that the firms most likely to exit as a result of the pandemic are less productive than other, more resilient firms within their sectors (Chart C, panel b).[10,11] Regarding firm entry, recent data show that firm entry declined at the onset of the crisis but recovered thereafter, to a higher level than before the crisis in some euro area countries, as well as in the United Kingdom and the United States.[12]

6 A shift-share analysis decomposes labour productivity growth into three terms: (i) intra-sector productivity growth, holding the economic weight of sectors constant (intra-sector contribution); (ii) change in sector economic weights holding sector productivity constant (inter-sector contribution); and (iii) the interaction between a change in sector economic weights and labour productivity growth (interaction or covariance).

7 See Bloom, N., Bunn, P., Mizen, P., Smietanka, P. and Thwaites, G., "The Impact of Covid-19 on Productivity", *NBER Working Paper Series*, No 28233, December 2020.

8 While the crisis might increase the exit of low-productivity firms and thereby support productivity growth, they might also undermine it depending on the nature of the shock and market distortions. See Foster, L., Grim, C. and Haltiwanger, J., "Reallocation in the Great Recession: Cleansing or Not?", *Journal of Labor Economics*, Vol. 34, No S1, 2016, pp. S293-S331.

9 See Criscuolo, C., "Productivity and Business Dynamics through the lens of COVID-19: the shock, risks and opportunities", working paper presented at the ECB Forum on Central Banking 2021.

10 This claim is based on a simulation of firm-level imbalances reflecting firms' financial conditions before the crisis and sector value added dynamics according to the Eurosystem staff projections for the euro area dated December 2020. Firms at risk are defined as those with negative working capital and at the top 25% of the leverage distribution within their country-sector.

11 These results are confirmed by survey data matched with administrative data for Spain (Fernández-Cerezo, A., González, B., Izquierdo, M. and Moral-Benito, E., "Firm-level heterogeneity in the impact of the COVID-19 pandemic", *Working Papers*, No 2120, Banco de España, May 2021) and in a multi-country framework by Criscuolo, C., op. cit.

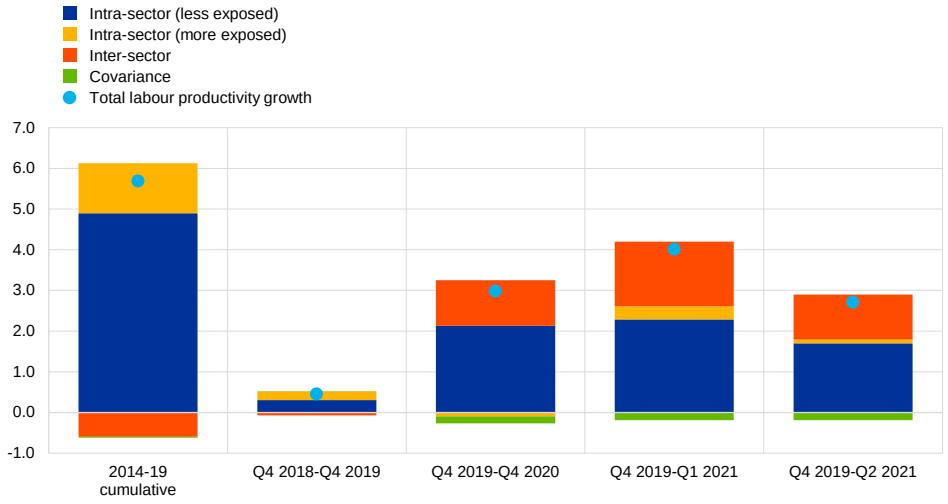
12 See Criscuolo, C., op. cit.

Chart C

Impact of the COVID-19 pandemic on resource reallocation and productivity

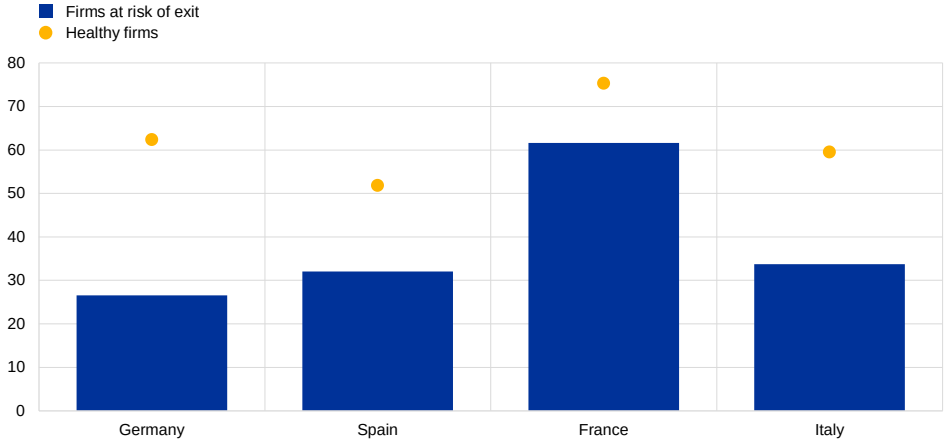
a) Contribution of inter- and intra-sector developments to aggregate productivity growth

(percentage points)



b) Productivity of firms at risk of exit and of healthy firms in the same country and sector according to ECB simulations

(EUR thousands)



Sources: Panel a: own calculations based on Eurostat data; panel b: ORBIS-iBACH and ECB staff calculations.
Notes: Panel a: sector labour productivity measured as real value added per hour worked. The intra-sector contribution is divided into the sectors least and most affected by the pandemic. The more exposed sectors are arts and entertainment, accommodation and food, transport and retail and wholesale trade. Panel b: productivity defined at the firm level as real value added per employee. Based on simulation of firm-level imbalances reflecting firms' financial conditions before the crisis and sector value added dynamics according to the Eurosystem staff projections for the euro area dated December 2020. The numbers refer to the quarter with the maximum number of firms at risk according to the simulations. Firms at risk of exit are defined as those with negative working capital and at the top 25% of the leverage distribution within their country-sector.

Looking ahead, productivity growth will depend heavily on the consolidation of widespread digital uptake and the design of the exit strategies from policy support. The accompanying article on productivity trends in this issue of the Economic Bulletin highlights a slowdown in the spread of innovation and technology in the euro area. Seen in this light, the observed acceleration in digital uptake could be a positive outcome from the crisis. However, the long-term productivity trend will depend heavily on institutions, infrastructure, skills and methods of production and management developing and digitising in tandem. Furthermore, digital adoption needs to be widespread, across sectors and firms. And finally, the massive policy

support granted to the corporate sector has been crucial in mitigating the initial impact of the shock. Once the recovery takes hold on a sustainable basis, however, policy support needs to be lifted gradually to avoid impairing the efficient reallocation of resources by setting wrong incentives. Accordingly, the design and timing of the exit strategies will determine how far aggregate productivity growth will be impacted by further after-effects from the shock.

5 Economic developments and outlook for contact-intensive services in the euro area

Prepared by Malin Andersson, Niccolò Battistini and Grigor Stoevsky

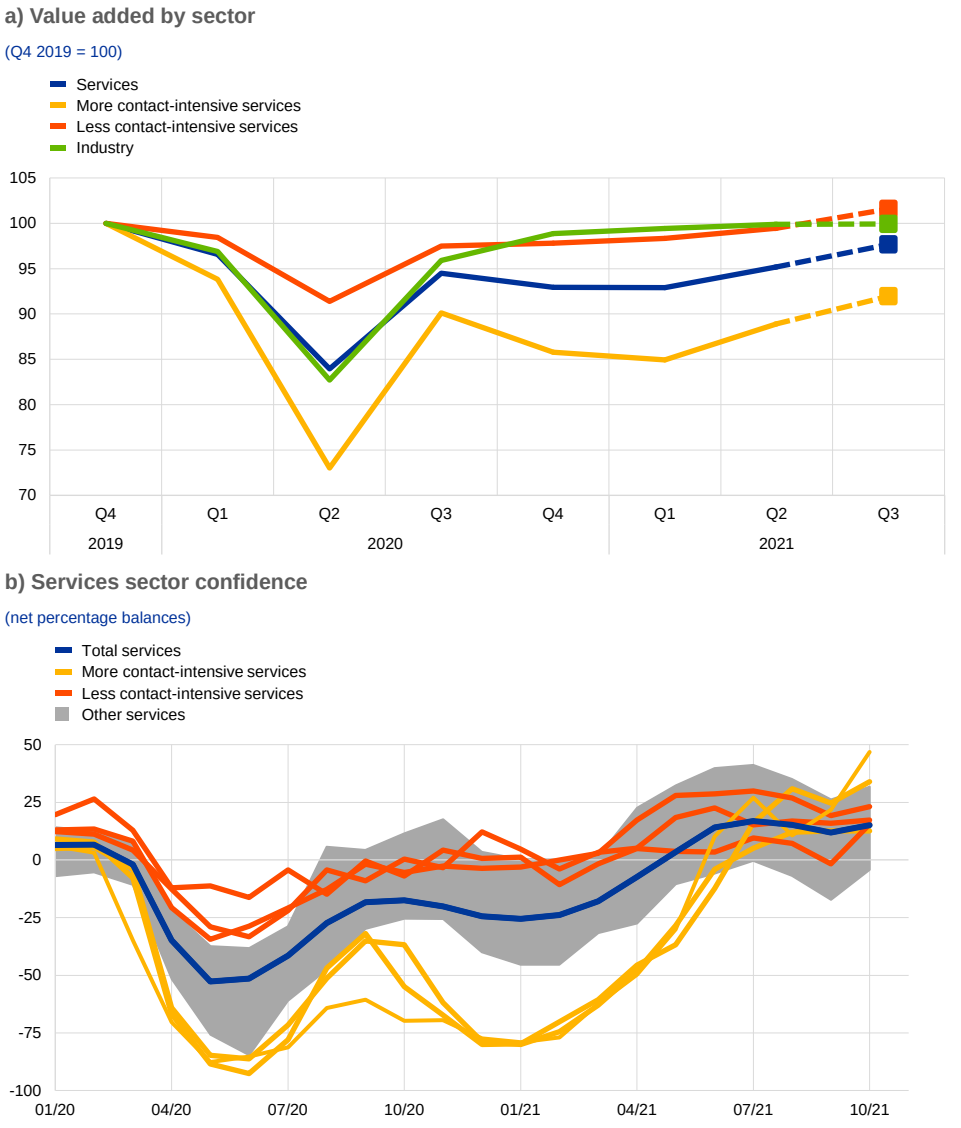
This box takes stock of the development of economic activity in euro area contact-intensive services that were adversely affected by the pandemic. During the first wave of the coronavirus (COVID-19) pandemic, value added in the manufacturing and services sectors behaved very similarly, contracting by more than 15% in the second quarter of 2020 compared with pre-pandemic levels. However, since then the recovery paths of the two sectors have been markedly different. The rebound in services activity was interrupted around the turn of the year, as some consumer services (henceforth "more contact-intensive services") were largely shut down as a result of the resurgence of the pandemic and the tightening of COVID-19 restrictions, while other consumer services (henceforth "less contact-intensive services") and manufacturing continued to recover (Chart A, panel a).[1]

After a bumpy 2020, more contact-intensive services began to rebound in spring 2021 and have been driving GDP growth since then. Preliminary flash GDP and production data imply a continued recovery in services value added in the third quarter of 2021. As the euro area economy reopened, tourism was a key driver of the strong upswing in more contact-intensive services activity. Together with the progress of vaccination campaigns, this has led to confidence in more contact-intensive sectors returning to and even overshooting pre-pandemic levels in recent months (Chart A, panel b). In addition, strong rises in credit card spending suggest more frequent use of more contact-intensive services like hospitality. However, despite this restored confidence, activity in these sectors has not fully regained its pre-crisis levels and there is still ample slack. Although perceived capacity utilisation has risen strongly since the second quarter of 2021, in the fourth quarter it amounted to only around 75% in the travel subsector and 85% in both the accommodation and food subsectors, which are the three most-affected subsectors. By the end of the third quarter, value added in more contact-intensive services was estimated to be approximately 8% below its pre-pandemic level.

[1] More contact-intensive services, representing 22% of the total economy before the pandemic, refer to wholesale and retail trade, transport, accommodation and food services (NACE2 Rev2 classification: G, H, I) as well as arts and entertainment (R, S, T, U). Less contact-intensive services, representing 33% of the total economy before the pandemic, cover information and communication (J), financial and insurance activities (K), real estate (L), professional, scientific and technical activities (M), and administrative and support service activities (N).

Chart A

Services sector developments



Sources: ECB calculations using Eurostat and ECFIN data.
Notes: Panel a): data for the third quarter of 2021 are based on quarterly data for value added in (1) manufacturing and other industry (referred to as "manufacturing" in the text), (2) construction and (3) other sectors. These data are imputed from available monthly data up to September for (1) industrial production excluding construction, (2) construction production and (3) residual with respect to real GDP according to the flash release. Panel b): the grey area refers to the interval between the maximum and minimum values of 17 other NACE services subsectors series covered by the European Commission's Economic Sentiment Indicator. Yellow lines refer to three selected more contact-intensive services sectors: accommodation, travel, and food and beverage. Red lines refer to three less contact-intensive services sectors: telecommunication, information and programming. The latest observations are for the second quarter of 2021 (value added) and October 2021 (confidence).

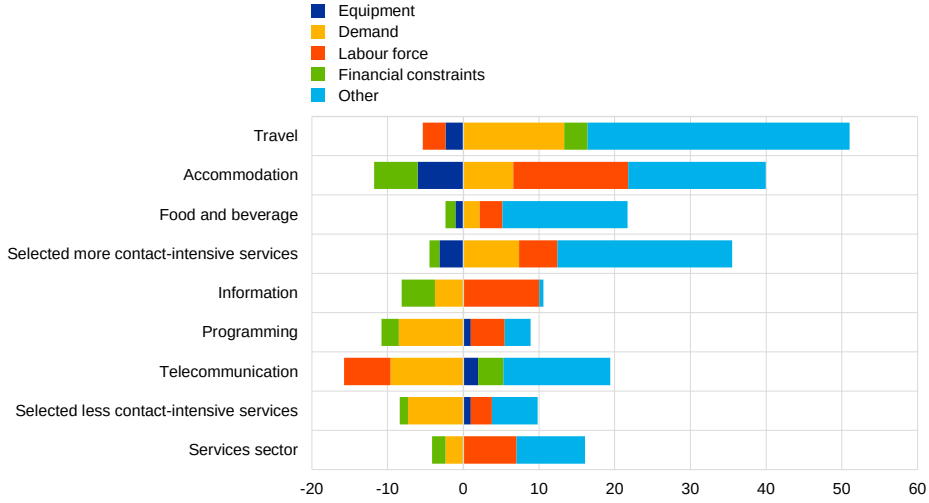
This notable slack in more contact-intensive services is confirmed by evidence that demand has been a more important factor limiting activity during the pandemic than it was before the pandemic. The limits on activity in more contact-intensive services are perceived as stemming largely from "other" factors, which are

mostly related to preventive pandemic containment measures,[2] and also to some extent from demand and labour input, while financial constraints play a broadly similar role in the fourth quarter of 2021 as they did before the pandemic (Chart B). Labour is perceived as an increasingly limiting factor to activity in more contact-intensive services, such as in the accommodation and the food and beverage subsectors. Unlike the manufacturing sector, the services sector is not experiencing shortages of materials, but it is more sensitive to pandemic-related constraints. From a cyclical perspective, the entire services sector is now in an expansionary phase. A majority of surveyed firms in more contact-intensive services report rising past and expected demand, suggesting an ongoing expansion (Chart C). These subsectors saw very strong expansions following the two pronounced dips during the earlier pandemic waves, which is also reflected in accelerating price pressures. In comparison, the less contact-intensive services subsectors exhibited much more contained cyclical variation over the past 18 months.

Chart B

Limits on activity in the services sector in the fourth quarter of 2021

(deviations from fourth quarter of 2019 in net percentage balances)



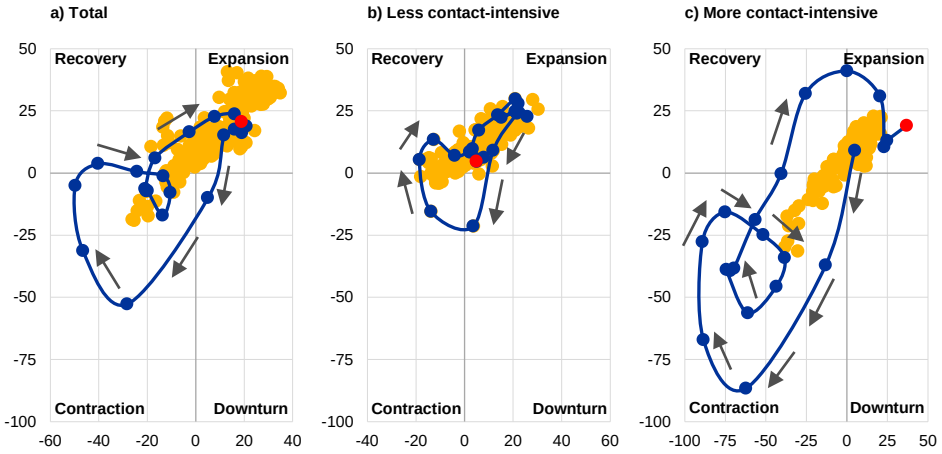
Source: ECFIN data.
Notes: Values for both more and less contact-intensive services refer to the average of the values for the three subsectors shown immediately above them. The latest observations are for the fourth quarter of 2021 (survey undertaken in October).

2 It is worth noting that in recent months mobility indices related to recreational activities (e.g. Google mobility index for retail and recreation) – which broadly reflect the extent of voluntary social distancing – recovered to pre-crisis levels, while indices related to more regulated activities (e.g. Google mobility index for workplaces) remained below pre-crisis levels. Based on data for the United States, much of the shift in mobility appears voluntary and lifting constraints may yield a quick recovery, provided the reduction in COVID-19 risk is deemed credible (see Maloney, W. and Taskin, T., "Determinants of Social Distancing and Economic Activity during COVID-19: A Global View", *Policy Research Working Paper Series*, No 9242, World Bank Group, May 2020). The reduction in voluntary social distancing and the improvement in confidence would therefore point to a continued recovery.

Chart C

Cycles across selected services sectors

(percentage balances; x-axis: demand over past three months; y-axis: demand over next three months)



Sources: ECB calculations using ECFIN data.
Notes: Yellow dots refer to the period from January 2011 to January 2019. Blue lines refer to the period from February 2020 to September 2021. "Less contact-intensive " and "more contact-intensive" refer to the selected subsectors exhibited in Chart B. The latest observations are for October 2021 (red dot).

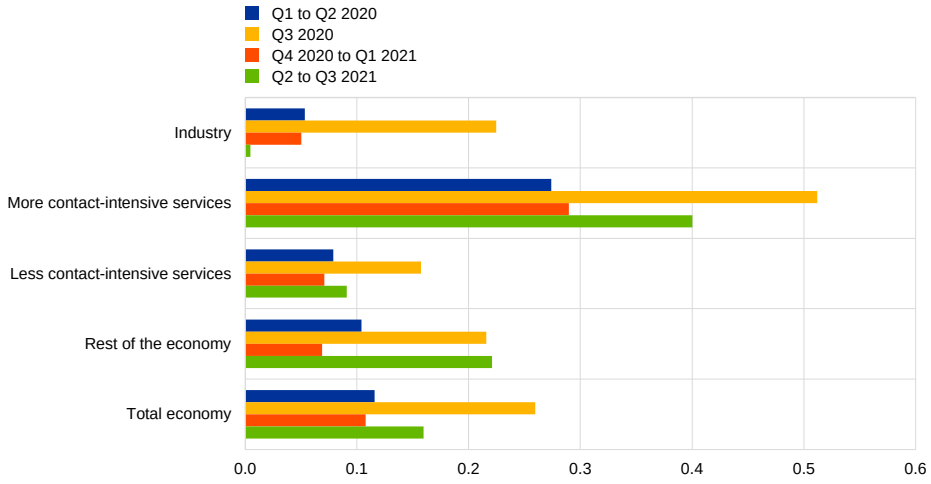
The stringency of containment measures has been an important factor affecting activity in more contact-intensive services since spring 2021. Model-based results suggest that the estimated sensitivity of aggregate economic growth to changes in the stringency of restrictions in the middle of 2021 increased from its average level at the turn of the year, but remained below the level reached in the third quarter of 2020 (Chart D).[3] The pattern observed for the total economy was largely driven by services, in particular more contact-intensive services subsectors, while the responsiveness of industry declined throughout recent quarters. Activity in more contact-intensive services appears to be more responsive to a loosening of containment measures than to a tightening, as shown by the relatively higher average estimated elasticities in the third quarter of 2020 and the second and third quarters of 2021, when the stringency of containment measures was relaxed. Overall, this evidence suggests that the continued reopening of the economy over the coming quarters will remain a key factor in the recovery of more contact-intensive services.

[3] For further details on the model, see the box entitled "The impact of containment measures across sectors and countries during the COVID-19 pandemic", *Economic Bulletin*, Issue 2, ECB, 2021.

Chart D

Estimated elasticities of sectoral activity to the stringency of containment measures

(impact of a one point decrease in the Oxford Stringency Index on real gross value-added quarter-on-quarter growth; percentage points)



Sources: Eurostat and authors' calculations.
Notes: Estimated sectoral elasticities for the third quarter of 2021 are based on quarterly data for value added in (1) manufacturing and other industry, (2) construction and (3) other sectors. These data are imputed from available monthly data for (1) industrial production excluding construction, (2) construction production and (3) residual with respect to real GDP according to the flash release. "Rest of the economy" refers to agriculture and public services.

As the public health crisis abates and economies reopen further, activity in more contact-intensive services is expected to continue to expand, but the medium-term outlook remains uncertain. The need to replace obsolete productive capacity, expand labour input and reallocate resources across subsectors could durably alter the trend growth of more contact-intensive services. At the same time, if containment measures are long-lasting or policy support is withdrawn abruptly, there may be an increase in insolvencies.[4,5] Moreover, changes in preferences, such as moving away from business travel and long-distance tourism towards hybrid working solutions and local vacation destinations, could cause permanent shifts in consumption patterns necessitating the sectoral reallocation of activity.[6]

To summarise, the COVID-19 pandemic has had a marked impact on more contact-intensive services in the euro area. While these subsectors made a significant contribution to economic growth in the middle of 2021, their growth potential will be determined by the evolution and containment of the pandemic in the near term, coupled with a number of structural factors in the medium term. The likely

4 For instance, bankruptcies in the accommodation and food services sector increased by 23% between the fourth quarter of 2019 and the second quarter of 2021, according to data from Eurostat. In other more contact-intensive services bankruptcies were lower in the second quarter of 2021 than at the onset of the crisis, in an environment where policy support remained strong.

5 In a study by the Federal Reserve Bank of New York, each additional week of closure in more contact-intensive services subsectors reduces the probability of a business reopening by 2 percentage points. Recent evidence from Banca d'Italia suggests that the COVID-19 pandemic has not significantly affected the number of active Italian firms in the tourism sector, but their relatively higher recourse to bank lending than before the pandemic will undermine their recovery when policy support is eventually withdrawn.

6 See IMF, "Managing Divergent Recoveries", *World Economic Outlook*, April 2021 and de Vet, J.M, et al., "Impacts of the COVID-19 pandemic on EU industries", Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, Luxembourg, 2021.

need for sectoral reallocation and the possible increase in company insolvencies might impair a quick and full recovery of more contact-intensive services.

6 The recovery of housing demand through the lens of the Consumer Expectations Survey

Prepared by Desislava Rusinova[1]

This box reports past trends and future expectations related to housing demand based on the ECB's new Consumer Expectations Survey (CES).[2] The decisions of households to purchase a house or flat depend on many factors, including their working status and financial situation, income and wealth, and their expectations regarding the general level of prices, housing prices and mortgage credit conditions. The CES can provide micro-level insights into the purchasing decisions of households as well as some of the determining factors. For instance, the share of CES respondents who have purchased a house/flat in the past 12 months can be seen as an indicator of recent housing demand for different socioeconomic groups. Similarly, the share of respondents who intend to buy a house/flat in the next 12 months provides a forward-looking indicator of housing demand. House purchases reported by CES respondents increased between the second and third quarters of 2020 and then plateaued (Chart A, panel a). At the same time, expected purchases in the next 12 months remained relatively stable throughout the period (dark blue bars).

1 The author would like to thank Pedro Neves, Niccolò Battistini, Johannes Gareis, Virginia di Nino and Moreno Roma for their input and comments.

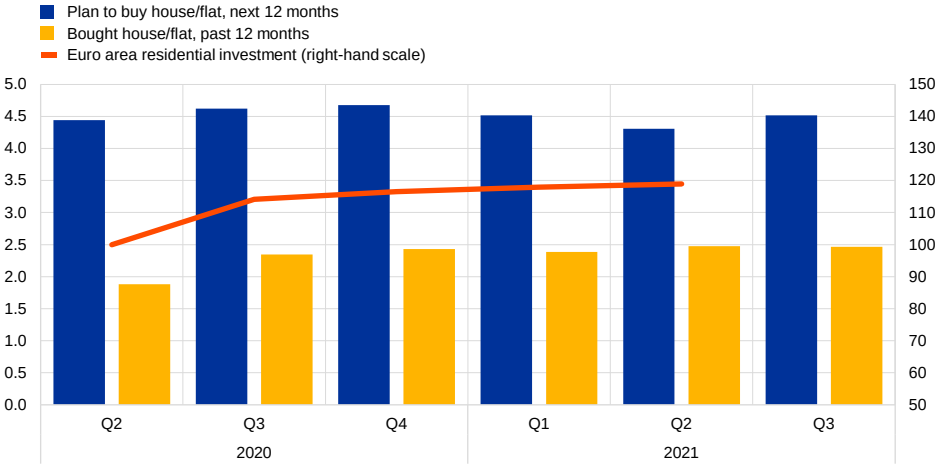
2 More detail on the CES is available in "ECB Consumer Expectations Survey: an overview and first evaluation", *Occasional Paper Series*, ECB, forthcoming.

Chart A

Recent and expected housing demand according to CES data

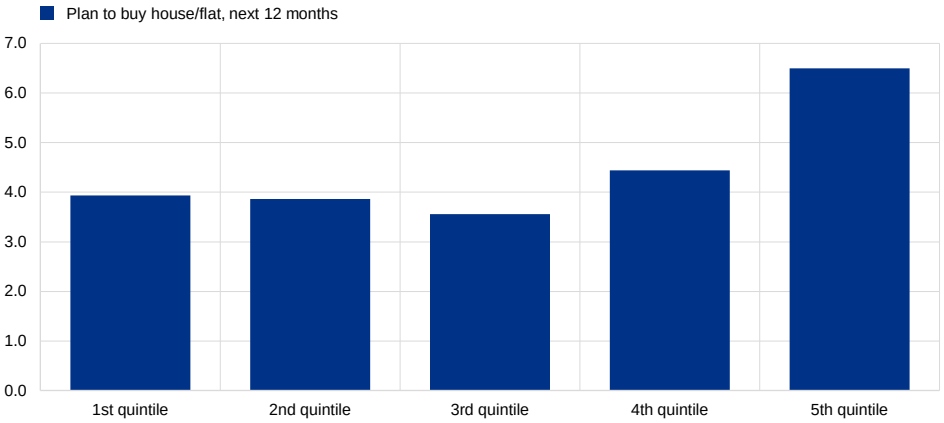
a) Share of respondents who have bought a house or flat in the past 12 months or plan to buy a house or flat in the next 12 months and residential investment

(left-hand scale: percentages; right-hand scale: index: Q2 2020 = 100)



b) Share of respondents who intend to buy a house/flat in the next 12 months, by income quintile

(percentages)



Source: CES.
Notes: Weighted averages of the six largest euro area countries. Panel a: shares of respondents who replied "yes" to whether they had purchased a house or flat in the past 12 months or whether they intend to buy a house or flat in the next 12 months. Quarterly averages are used to smooth sample composition effects as the sample is relatively small. The red line shows real residential investment from the national accounts, normalised to 100 in the second quarter of 2021. Panel b: shares of respondents planning to buy a house/flat by income quintile; averages over the period February-August 2021.

The intention to buy a house/flat differs according to household income.

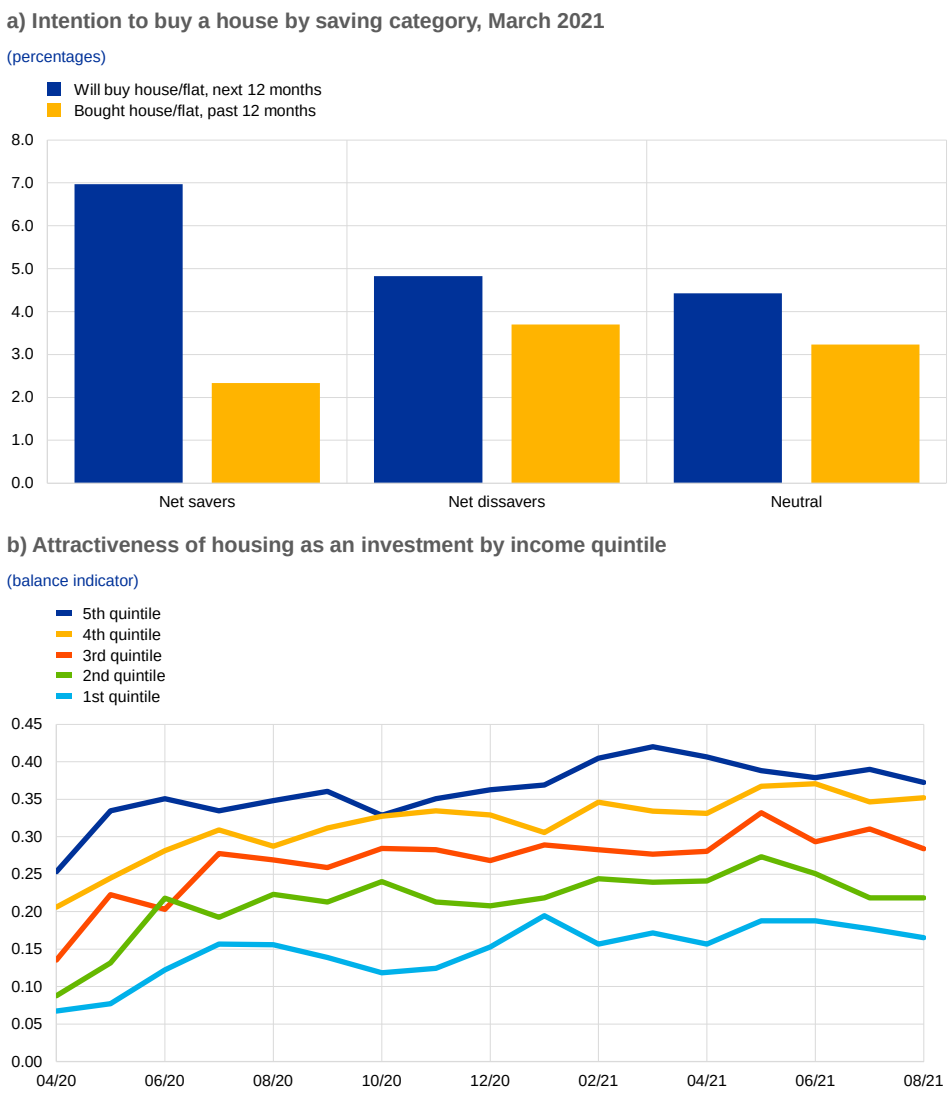
Households from higher income quintiles are much more likely to intend to buy a house or flat in the next 12 months than lower-income households (Chart A, panel b) and are therefore likely to provide stronger support for housing demand. Moreover, these households are also the most likely to have actually bought a house or flat in the past 12 months. In addition to level of income, expected income dynamics also play an important role in decisions to invest in housing: respondents intending to buy a house in the next 12 months tend to have substantially higher income growth expectations than those who do not intend to do so.

While accumulated savings are likely to have already been used for house purchase, these may still boost housing demand over the near term. The amount of accumulated savings, or savings behaviour in general, can have an impact on the decision to purchase a house or flat. In March 2021, the CES collected information about respondents' accumulated savings since the beginning of the coronavirus (COVID-19) pandemic, distinguishing between net savers, net dissavers, and a neutral category (those who have saved approximately as much as they have dissaved).[3] An analysis of these data shows that net dissavers generally had the highest share of home buyers in the past 12 months (Chart B, panel a). When also asked about the reasons for dissaving, 36% of dissavers indicated that "An increase in my household spending because of a major purchase that I/we had planned for (e.g. house, car, etc.)" had been important or very important. This suggests that, at least to some extent, accumulated savings may have already been used for house purchases by March 2021, and some households are net dissavers because they have paid for house purchases. Looking forward, net savers had the highest share of expected house buyers. Hence, although some transactions driven by excess savings during the pandemic may have already materialised, the large stock of accumulated savings may still boost housing demand over the near term. About 44% of net savers declare that "a desire to put aside enough money to make a major purchase in the future (e.g. house, car, etc.)" has been an important or very important reason for accumulating savings since January 2020.

[3] The descriptions are based on the following response options in the questionnaire: net savers – "the household has added more money than it has withdrawn since January 2020"; net dissavers – "the household withdrew more money than it added"; and neutral – "the household added as much money as it withdrew". The responses of non-savers – "the household has neither added nor withdrawn money" and "we do not have any money in savings or financial investments" – are less relevant for the purposes of this box and are not considered.

Chart B

The link between savings, housing demand and housing attractiveness



Source: CES.
Notes: Balance indicator calculated as the sum of "good" and "very good" responses minus the sum of "bad" and "very bad", divided by the number of respondents in the respective group. Weighted average of the six largest euro area countries.

The attractiveness of housing as an investment has increased since the start of the pandemic and remains high, particularly for households in the higher income quintiles. A useful indicator of potential housing demand for investment purposes is the degree of attractiveness of housing as an investment in the respondents' own neighbourhood, which is measured on a five-step scale. The balance indicator for housing attractiveness rose across all income categories over the survey period, before levelling off in spring 2021. The increase was particularly pronounced among respondents in the highest income quintiles (Chart B, panel b).[4]

[4] The choice of neighbourhood is likely to depend on income, so higher-income households are likely to invest in higher-quality neighbourhoods, which in turn makes them a better investment.

Expectations for credit conditions and housing prices point to a dynamic housing market. As factors increasing housing demand, CES respondents pointed to, among other things, expectations of easier access to credit in the future and declining mortgage rates. At the same time, in the period between April 2020 and May 2021, respondents almost continuously increased their expectations for house price growth. This suggests continued strong demand in the housing sector but also possible affordability issues for the lower income quintiles, as expected growth in housing prices has been much stronger than expected growth in household income and the general price index.

7 The prevalence of private sector wage indexation in the euro area and its potential role for the impact of inflation on wages

Prepared by Gerrit Koester and Helen Grapow

Shocks to inflation can have longer-lasting effects in the presence of second-round effects and second-round effects are more likely in the presence of wage indexation. Second-round effects can occur if households and/or firms attempt to compensate the loss of real income incurred by higher inflation when setting wages and/or prices. The potential effects of wage indexation mechanisms on wage setting and inflation developments depend not only on the prevalence of wage indexation to inflation, but also on the inflation indicator used for indexation. This box investigates the prevalence of wage indexation mechanisms in the private sector.[1] As wage-setting mechanisms differ considerably across euro area countries, regulations across countries are analysed and a euro area indicator is derived by aggregating characteristics of national wage indexation schemes using country shares in euro area private sector employment as weights.

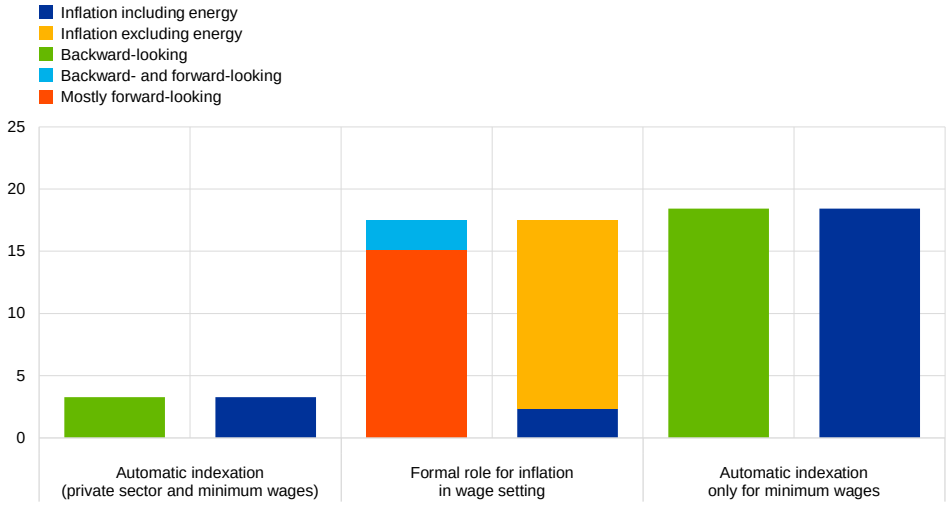
Across euro area countries, four different wage indexation regimes can be identified, ranging from automatic wage indexation schemes to regimes with no formal role for inflation in wage setting (Chart A). The first, more general automatic wage indexation scheme functions in a way that inflation developments automatically feed into wage setting – therefore aiming to neutralise the effects of inflation on the purchasing power of labour incomes. Under the second regime, inflation plays a formal role in wage negotiations, for example in the form of an explicit inflation benchmark guiding wage negotiations. However, this may only apply to some sectors of the economy and the effects of inflation on wage setting is also often less direct and less automatic than under automatic wage indexation. The third regime deploys inflation indexation for minimum wages only – therefore aiming to neutralise the effects of inflation on purchasing power for employees on the lowest labour incomes. All other regimes which have no formal role for inflation indexation in wage setting fall into the fourth category.

1 This box focuses primarily on inflation effects through the indexation of private sector wages to inflation. Additional effects could stem from the public sector, for example, through the indexation of public sector pensions to inflation or through other special indexation schemes.

Chart A

Prevalence of wage indexation to inflation in the euro area

(share of total private sector employees in the euro area in percentages; 2021)



Sources: Eurosystem and ECB staff calculations.

With regard to the inflation indicator, wage indexation can be forward- or backward-looking and can include or exclude energy prices. Backward-looking indicators imply a lagged adjustment of wages to observed inflation, while forward-looking indicators need to rely on forecasts. There is evidence that wage indexation based on backward-looking inflation measures makes the effect of inflationary shocks longer-lasting and inflation stabilisation harder than wage indexation that is based on forward-looking measures.[2] In some cases, backward- and forward-looking indicators are combined – linking wage growth to inflation forecasts but incorporating, for example, ex post compensation for inflation forecast errors. Where the inflation measure used for wage indexation includes energy, global oil price shocks can have persistent effects on domestic underlying inflation through wage indexation and the possibly resulting wage-price spiral.

In the euro area, general automatic wage indexation schemes only apply to a very small share of employees. All in all, only around 3% of private sector employees in the euro area have their wages and minimum wages automatically indexed to inflation.[3] For most of the employees covered by these regimes, the inflation measure is backward-looking and includes energy (first two columns of Chart A).[4]

2 See, for example, Crowley, J., "The Effects of Forward-Versus Backward-Looking Wage Indexation Price Stabilization Programs", *IMF Working Papers*, Issue 38, IMF, April 1997.

3 Automatic wage indexation applies to a large share of private sector employees in Belgium, Cyprus, Malta and Luxembourg.

4 In Belgium, the relevant inflation index excludes petrol, tobacco and alcohol.

Indexation regimes with a formal role for inflation developments in wage negotiations apply to around 18% of employees in the euro area. In these cases, they consider mostly forward-looking inflation measures that exclude energy.[5]

Around 18% of euro area private sector employees work in countries where only the minimum wages are automatically indexed to inflation. These indexation mechanisms are usually backward-looking with an inflation measure that includes energy. While usually only a relatively small share of employees in euro area countries earns the minimum wage,[6] the indexation of minimum wages to inflation usually acts as a floor in other wage agreements. Furthermore, increases in minimum wages often play an important role as a general benchmark for sectoral wage agreements.[7]

For more than half of the private sector employees in the euro area, inflation does not play a formal role in wage setting but can be an important factor in wage negotiations. That said, where there is no formal role for inflation, inflation developments have often been of little importance (compared with regimes where inflation does play a formal role), for example, during times of high uncertainty or large external shocks, with the focus instead being on job security.

Since the Great Financial Crisis, indexation regimes with a formal role for inflation in wage setting have become somewhat less prevalent (Chart B).[8] The share of private sector employees with a formal role for inflation in wage setting has decreased in the euro area by around 6 percentage points since 2008, with the decline in the share of workers covered by contracts with backward-looking inflation indexation in Spain playing a key role. The remaining share of contracts for which a formal role for inflation is foreseen now refer predominantly to forward-looking inflation measures that exclude energy.[9] As a consequence of the fall in the share of indexation regimes with a formal role for inflation in wage setting, the share of private sector employees for which inflation plays no formal role in wage setting has increased in the euro area since the Great Financial Crisis. As for more general automatic indexation regimes that cover private sector wages and regimes that only index the minimum wages to inflation, there have been no significant changes in their importance since the Great Financial Crisis, and the type of inflation measures used for the indexation has not altered much either.

5 The most prominent example is Italy, where the Italian National Institute of Statistics' annual three-year forecast of the Consumer Price Index excluding energy is the central benchmark for wage agreements at the sectoral level.

6 For the share of minimum wage earners, see "Eurostat's minimum wage statistics" and the box entitled "Recent developments in social security contributions and minimum wages in the euro area", *Economic Bulletin, Issue 8, ECB, 2019.*

7 For further details on France, see Fougère, D., Gautier, E and S. Roux, "Wage floor rigidity in industry-level agreements: Evidence from France", *Labour Economics,* Vol. 55, September 2018.

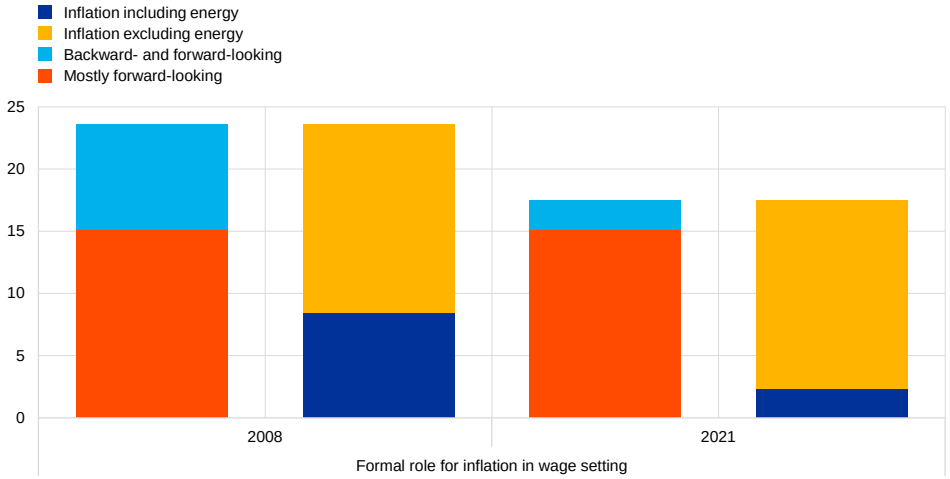
8 For further details on wage indexation regimes at the time of the Great Financial Crisis, see the box entitled "Wage indexation mechanisms in euro area countries", *Monthly Bulletin,* ECB, May 2008.

9 These regimes are prevalent in Italy.

Chart B

Prevalence of wage indexation in the euro area in 2008 compared with 2021

(share of total private sector employees in the euro area in percentages; 2021)



Sources: Eurosystem and ECB staff calculations.
Note: Only regimes with a formal role for inflation in wage setting are shown in this chart, as there were no significant changes to the other regimes shown in Chart A.

Overall, the likelihood of wage-setting schemes triggering second-round effects based on inflation indexation is relatively limited in the euro area, particularly when it comes to energy inflation. In some countries, the recent hikes in energy inflation could therefore be expected to lead to automatic increases predominantly in minimum wages, since the corresponding indexation mechanisms usually consider an inflation measure that includes energy. These minimum wage increases could then be passed through to generally higher wage agreements, given that minimum wage increases can serve as a benchmark for wage structures in the overall economy. For wage indexation regimes with a formal role for inflation in wage negotiations, only very limited direct effects from the recent energy inflation hikes are to be expected, since these regimes predominantly use an inflation measure that excludes energy. Overall, unless the shock to inflation leads to a significant increase in wage indexation, a broadly based and automatic pass-through of recent inflation hikes to wage growth seems rather unlikely given the prevailing mechanisms.[10]

[10] See the discussion in Nickel, C. et al., "Understanding low wage growth in the euro area and European countries", *Occasional Paper Series,* No 232, ECB, September 2019.

8 Results of a special survey of professional forecasters on the ECB's new monetary policy strategy

Prepared by Aidan Meyler, Marta Saez Moreno, Rodolfo Arioli and Franziska Fischer

Along with the Survey of Professional Forecasters (SPF) for the fourth quarter of 2021, participants were asked to complete an additional special survey on the ECB's new monetary policy strategy. The aim of that survey was to gain an insight into how the participants in the regular SPF have assessed the new strategy and into whether it has already had, or will have, an impact on their forecasts. The questionnaire, together with the aggregate results, is available on the "Background on the survey of professional forecasters" webpage. This box summarises some of the findings.

A vast majority of respondents considered the ECB's new monetary policy strategy to be an improvement and, on balance, thought that it made it more likely that the ECB would meet its primary objective of price stability in the euro area (Chart A). Two-thirds of respondents were of the opinion that the new monetary policy strategy was either "somewhat better" or "much better", with only a small minority viewing it as "somewhat worse". The so-called net percentage balance[1] was clearly positive at +45%. Almost 40% of respondents thought that the new strategy would make it either "somewhat more likely" or "much more likely" that the ECB would meet its mandate, and just over half thought it would be "about the same" (i.e. neither more nor less likely). Only a few respondents thought it would make it "somewhat less likely" and none thought it would be "much less likely". The net percentage balance was positive at +19%.

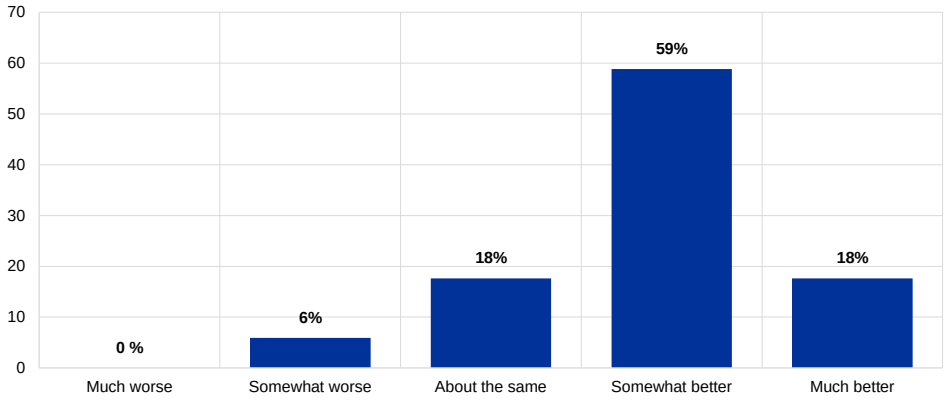
[1] The net percentage balance is calculated as (a) the portion of respondents saying "much better" plus half of the portion saying "somewhat better" minus (b) half of the portion saying "somewhat worse" and the portion saying "much worse". This score is bounded in the range ±100%, with +100% meaning that all respondents stated "much better" and -100% meaning that all respondents stated "much worse". A positive (negative) net percentage balance generally indicates that more respondents thought that it was better (worse).

Chart A

What is your overall assessment of the ECB's monetary policy strategy compared with the situation before and will it make it more or less likely that the ECB will meet its mandate and primary objective?

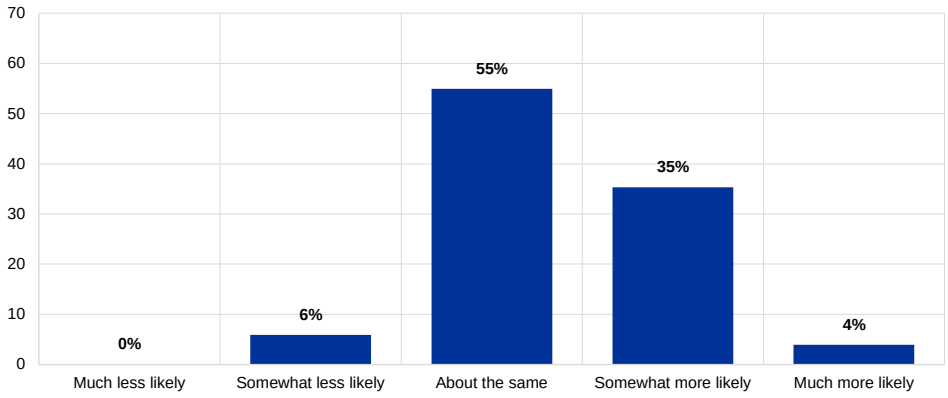
a) What is your overall assessment of the ECB's new monetary policy strategy compared with the situation before?

(percentage of responses)



b) In your opinion, will the new strategy make it more or less likely that the ECB will meet its mandate and primary objective of price stability in the euro area?

(percentage of responses)



Source: Special SPF survey in the fourth quarter of 2021.
Note: There were 51 responses for each question.

Respondents identified the clearer 2% and symmetric inflation target as the key elements of the new strategy. They also viewed those elements as the key improvements, particularly as they made the target more understandable for the general public. Respondents also considered that they facilitated the understanding of the ECB's reaction function. Some respondents stated that it was the practical implementation in terms of actual policy changes that would ultimately determine the success of the new strategy. When asked about negative or missing aspects, a relatively common theme was that participants saw some ambiguity in various aspects of the new strategy, such as the inclusion of owner-occupied housing and the possible extent and duration of an overshooting of the inflation target that might be tolerated. A number of respondents also thought that monetary policy might be distracted from its primary objective by the consideration of other aspects, such as climate change. Some respondents were of the opinion that the new strategy did not

adequately clarify some dimensions of asset purchases (in particular possible limits on holdings).

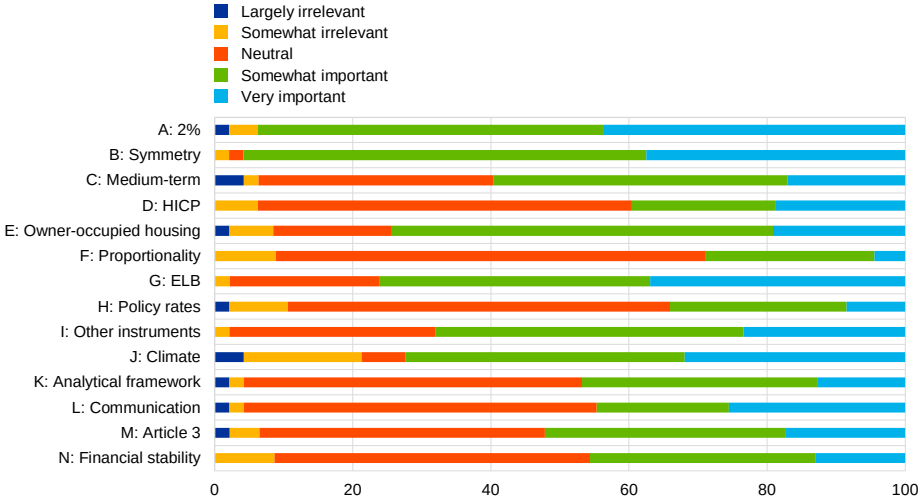
When asked explicitly about the importance of specific elements of the new strategy and whether these were better or worse, most respondents considered them all to be at least "somewhat important" and all at least "somewhat better" (Chart B). For example, with regard to the "move away from 'below, but close to, 2%' to '2%'", a clear majority of respondents considered it to be either "very important" (44%) or "somewhat important" (50%). In terms of whether that change was viewed as an improvement or deterioration, again a clear majority thought it had made the strategy either "much better" (31%) or "somewhat better" (60%).

Chart B

Respondents were asked for their opinion of the following elements/statements in terms of their unimportance/importance and whether they represent a deterioration/improvement in the strategy.

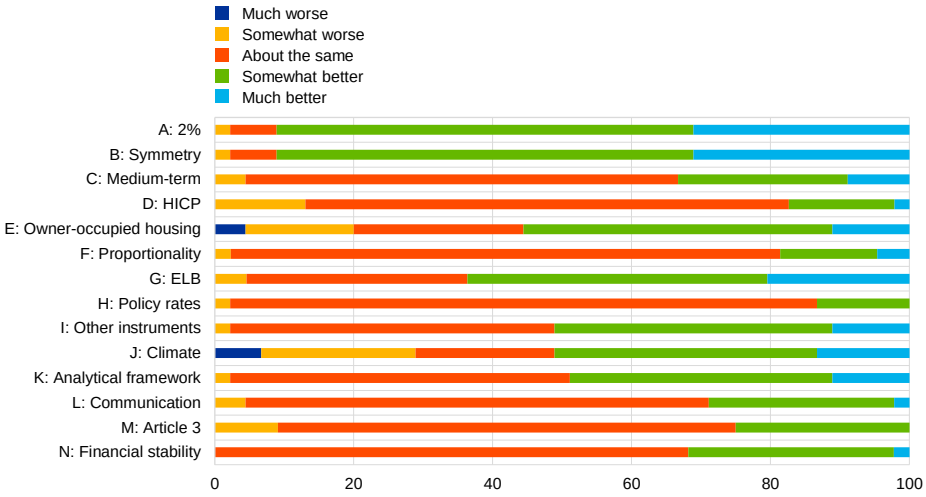
a) What is your assessment of the following elements/statements in terms of their unimportance/importance?

(percentage of responses)



b) What is your assessment of the following elements/statements in terms of whether they represent a deterioration/improvement in the strategy?

(percentage of responses)



Source: Special SPF survey in the fourth quarter of 2021.
Notes: There were 43-48 responses for each element/statement. Element A refers to "Move away from 'below but close to 2%' to '2%'"; Element B refers to "Explicit reference to symmetry in the 2% inflation target"; Element C refers to "Confirmation of medium-term orientation"; Element D refers to "HICP remaining appropriate index for quantifying the price stability objective"; Element E refers to "Recommendation of roadmap to include owner-occupied housing in the HICP"; Element F refers to "Proportionality assessment"; Element G refers to "Especially forceful or persistent monetary policy measures when close to effective lower bound (ELB)"; Statement H refers to "Primary monetary policy instrument is the set of ECB policy rates"; Statement I refers to "Other instruments (forward guidance, asset purchases and longer-term refinancing operations) will remain an integral part of the toolkit"; Element J refers to "Adoption of climate-related action plan"; Element K refers to "Analytical framework (from two-pillar to integrated assessment of economic and monetary and financial analysis)"; Element L refers to "Communication"; Statement M refers to "Without prejudice to the price stability objective, the Eurosystem shall support the general economic policies in the EU with a view to contributing to the achievement of the Union's objectives as laid down in Article 3 of the Treaty on European Union"; and Statement N refers to "The Eurosystem shall also contribute to the smooth conduct of policies pursued by the competent authorities relating to the prudential supervision of credit institutions and the stability of the financial system".

In general, there was a strong correlation between the ranking of the various elements/statements in terms of their perceived importance in the new

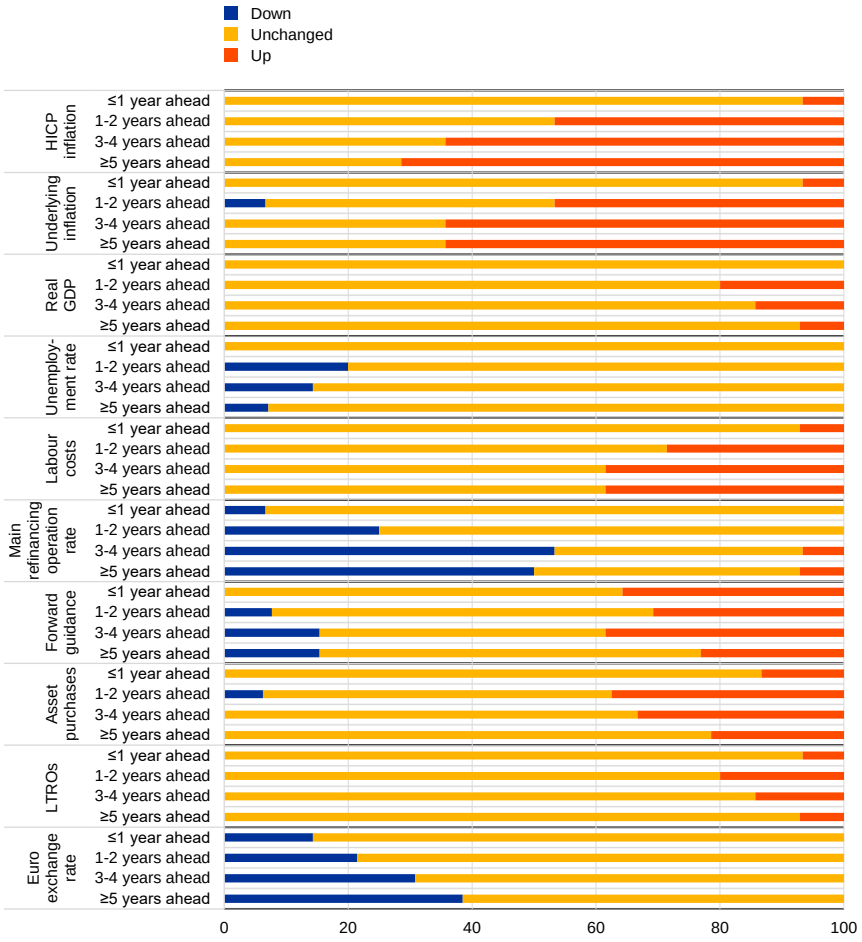
strategy and their perceived improvement on the previous strategy. Taking the percentage balance between positive and negative assessments as a summary statistic, respondents ranked the explicit reference to symmetry and the move away from "'close to, but below, 2%'" to '2%'" as the two most important or relevant elements. Other elements with relatively high net percentage balances include the reference to especially forceful or persistent monetary policy action when the economy is close to the effective lower bound, the permanently expanded toolkit and climate-related action. It should also be noted that there was a positive net percentage balance for all of the elements/statements surveyed, indicating that respondents viewed them as important. In terms of their improvement on the previous strategy, the first four items (i.e. symmetry, 2%, forceful action at the effective lower bound and the toolkit) received the same ranking as for their importance.

Around one-third of respondents stated that they had changed their macroeconomic expectations more generally in response to the new strategy. Chart C lists the variables and the direction of the revisions. For headline inflation, underlying inflation and labour costs, changes to near-term forecasts were limited, while changes to longer-term forecasts were revised upwards. For real economy variables (real gross domestic product (GDP) and the unemployment rate), the changes reported were generally to medium-term forecasts. For elements of the ECB's monetary policy toolkit (interest rates, forward guidance, asset purchases and longer-term refinancing operations (LTROs)) respondents had generally revised their forecasts in response to the new strategy in the direction of an easing of the policy stance.

Chart C

For each variable/assumption and horizon, respondents were asked to indicate the direction (down, unchanged or up) in which they had changed their macroeconomic forecasts.

(percentage of responses)



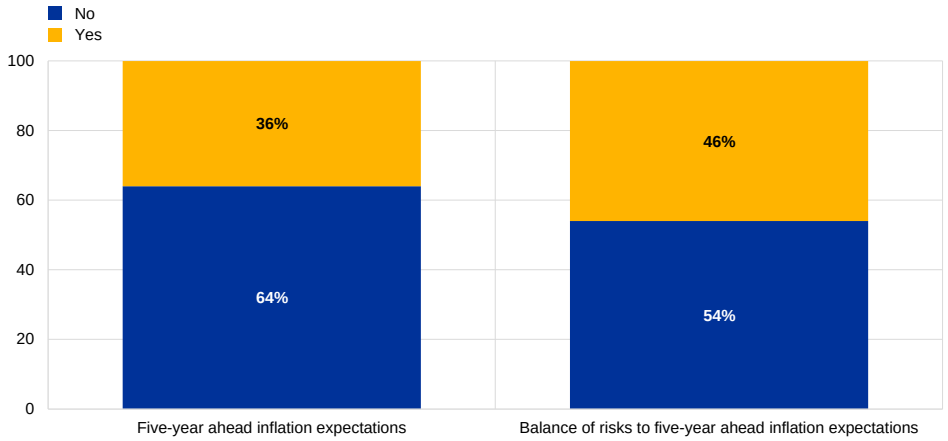
Source: Special SPF special survey in the fourth quarter of 2021.
Notes: There were 13-16 responses for each variable and horizon. For forward guidance, "shorter" is represented by "down" and "longer" is represented by "up"; for the euro exchange rate, "down (depreciation)" is represented by "down" and "up (appreciation)" is represented by "up".

Considering longer-term inflation expectations specifically, some respondents reported that they had changed both their point longer-term inflation expectations and the balance of risks surrounding them in response to the new strategy. While a large portion (around 60%) of respondents had kept their five-year ahead inflation expectations unchanged in response to the new monetary policy strategy, over one-third had revised them upwards (Chart D). When asked how by much they had changed their five-year ahead inflation expectations, two-thirds said by 0.1 percentage points. With regard to their point expectations, more respondents (nearly half) indicated that they had revised upwards their assessment of the balance of risks to the five-year ahead inflation expectations.

Chart D

In response to the new monetary policy strategy, respondents were asked if they had revised or changed their assessments of…

(percentage of responses)



Source: Special SPF survey in the fourth quarter of 2021.
Note: There were 50 responses for each question.

Articles

1 The predictive power of equilibrium exchange rate models

Prepared by Michele Ca' Zorzi, Pablo Anaya Longaric and Michał Rubaszek[1]

1 Introduction

Central banks carefully monitor the evolution of exchange rates. In the case of the European Central Bank (ECB) and other major central banks, the exchange rate is not a policy target. But the "market value" of the euro is highly relevant for understanding the medium-term inflation outlook via its impact – through import prices and through general equilibrium effects – on the real economy.

It would therefore be very useful to be able to anticipate future exchange rate movements, but this has proven rather elusive, especially at short horizons. The view that exchange rates are largely disconnected from economic fundamentals at short horizons has mainly predominated since the seminal paper by Meese and Rogoff (1983), which showed that exchange rate models were unable to deliver more accurate nominal exchange rate forecasts than the simple prediction of "no change" associated with the random walk (RW) model.[2] The difficulty of predicting exchange rates with systematically better results than by using the RW model, especially at short-horizons, was reiterated by Rogoff (2008)[3] and, more recently, in the influential articles by Rossi (2013)[4] and Cheung et al. (2019)[5].

Exchange rates have an important role beyond their key contribution to understanding the inflation outlook. While, in line with their monetary policy strategies, the ECB, the US Federal Reserve System and other major central banks

1 This article has benefited from helpful comments by Philip Lane, Fabio Panetta, Livio Stracca, João Sousa, Michael Fidora, David Lodge, Arnaud Mehl, Chiara Osbat and Alexandra Buist.

2 Meese, R. A. and Rogoff, K., "Empirical exchange rate models of the seventies: Do they fit out of sample?", *Journal of International Economics*, Vol. 14(1-2), 1983, pp. 3-24. The authors showed that these results hold even when the models have the advantage of using known, realised economic fundamentals. A theoretical explanation of these findings is presented by Engel et al. (2008), who showed that, under certain conditions, model-based forecasts may be less accurate than an RW benchmark, even if the model reflects the true underlying data-generating process. For more details, see Engel, C., Mark, N.C. and West, K.D., "Exchange rate models are not as bad as you think", in Acemoglu, D., Rogoff, K. and Woodford, M. (eds.), *NBER Macroeconomics Annual 2007*, Vol. 22 of NBER Chapters, National Bureau of Economic Research, 2008, pp. 381–441.

3 Rogoff, K., comment on the paper by Engel, C., Mark, N.C. and West, K.D., "Exchange rate models are not as bad as you think", in Acemoglu, D., Rogoff, K. and Woodford, M. (eds.), *NBER Macroeconomics Annual 2007*, Vol. 22 of NBER Chapters, National Bureau of Economic Research, 2008, pp.443–452, https://www.nber.org/system/files/chapters/c4076/c4076.pdf

4 Rossi, B., "Exchange rate predictability", *Journal of Economic Literature*, Vol. 51, 2013, pp. 1063-1119.

5 Cheung, Y.-W., Chinn, M.D., Pascual, A.G. and Zhang, Y., "Exchange rate prediction redux: New models, new data, new currencies", *Journal of International Money and Finance*, Vol. 95, 2019, pp. 332–336.

do not treat the exchange rate as a target variable,[6] they are mindful that if large and persistent nominal exchange rate fluctuations occur, real exchange rate misalignments may develop over time that could have significant implications for the economic outlook. This is because over- and undervalued currencies, in an environment of price rigidity, could lead to competitiveness imbalances, excessive real exchange rate volatility and, potentially, sharp economic adjustments with adverse effects on consumption and production.[7] This is the context in which currencies' "fair value" is often discussed. In exceptional instances, major central banks have intervened directly or only verbally in foreign exchange markets in a concerted manner to influence exchange rate dynamics. It is hence not surprising that academics and policymakers have continued to strive in recent decades to improve their methodological frameworks for assessing equilibrium exchange rates (e.g. Bussière et al., 2010; Phillips et al., 2013; Fidora et al., 2017; Couharde et al., 2018; and Cubeddu et al., 2019).[8]

Recent papers have argued that concepts of equilibrium exchange rates, besides their intrinsic interest, could be helpful for understanding and predicting exchange rate movements. These papers suggest that, even if the dynamic adjustment of exchange rates cannot be fully anticipated, it is known that they should eventually adjust to their equilibrium, i.e. a terminal condition defined by economic theory. For example, Ca' Zorzi et al. (2016) and Ca' Zorzi and Rubaszek (2020)[9] show that it is sufficient to assume that the real exchange rate gradually converges to the simplest definition of the equilibrium exchange rate, i.e. relative purchasing power parity (PPP), to produce surprisingly accurate real and nominal exchange rate forecasts. In theory, this approach is best suited to predicting real exchange rates, as the concept of the equilibrium exchange rate is defined in real terms. But empirical evidence shows that real exchange rate adjustments occur primarily through currency movements rather than via relative price changes. Thus, at least for countries with moderate inflation rates, measures of real equilibrium exchange rates can also be employed to forecast nominal exchange rates.[10] From a

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6 For a review of the role of the exchange rate in the case of the ECB, see the Work Stream on Globalisation, "The implications of globalisation for the ECB monetary policy strategy", *Occasional Paper Series*, No 263, ECB, September 2021.

7 The concept and measurement of the equilibrium exchange rate is particularly relevant also for central banks adopting managed exchange rate regimes or for countries joining the exchange rate mechanism and later fixing their parity irrevocably to the euro.

8 Bussière, M., Ca' Zorzi, M., Chudik, A. and Dieppe, A., "Methodological advances in the assessment of equilibrium exchange rates". *Working Paper Series*, No 1151, European Central Bank, 2010; Phillips, S., Catao, L., Ricci, L.A., Bems, R., Das, M., di Giovanni, J., Unsal, D.F., Castillo, M., Lee, J., Rodriguez, J. and Vargas, M., "The External Balance Assessment (EBA) Methodology", *IMF Working Papers*, No 13/272, International Monetary Fund, 2013; Couharde, C., Delatte, A.L., Grekou, C., Mignon, V. and Morvillier, F., "EQCHANGE: A world database on actual and equilibrium effective exchange rates", *International Economics*, Vol. 156, 2018, pp. 206–230; Cubeddu, L.M., Krogstrup, S., Adler, G., Rabanal, P., Dao, M.C., Hannan, S.A., Juvenal, L., Buitron, C.O., Rebillard, C., Garcia-Macia, D. and Jones, C., "The External Balance Assessment Methodology: 2018 Update", *IMF Working Papers*, No 19/65, International Monetary Fund, 2019.

9 Ca' Zorzi, M., Muck, J. and Rubaszek, M., "Real exchange rate forecasting and PPP: This time the random walk loses", *Open Economies Review*, Vol. 27, 2016, pp. 585–609; Ca' Zorzi, M. and Rubaszek, M., "Exchange rate forecasting on a napkin", *Journal of International Money and Finance*, Vol. 104, 2020.

10 This property is also partly embedded in theoretical sticky price models. However, in these models the obtained co-movement between real and nominal exchange rates tends to be smaller than in the actual data.

different starting point, Ca' Zorzi et al. (2017)[11] and Eichenbaum et al. (2020)[12] suggest that more advanced macroeconomic models, known as dynamic stochastic general equilibrium (DSGE) models – which assume that real and nominal exchange rate fluctuations are driven by differences in the monetary policy stance adjusted for risk premia – also offer a fairly good description of exchange rate dynamics and perform well overall in forecasting real and, to a lesser extent, nominal exchange rates. The explanation for this is that, like simpler approaches, such models imply a gradual return of the real exchange rate toward its equilibrium PPP value, but they tend to underestimate the empirical regularity of a strong co-movement between real and nominal exchange rates.

The key question addressed in this article is whether concepts of equilibrium exchange rates other than PPP might strengthen the predictability of exchange rates. To the extent that long-term drivers of exchange rates can be understood, and hence the equilibrium exchange rate can be estimated more precisely, it should in theory be possible to better forecast the future trajectory of the real and nominal exchange rate. For that purpose, this article evaluates the predictive power of three popular equilibrium exchange rate models. Besides the PPP model, we also investigate simplified versions of the behavioural equilibrium exchange rate (BEER) and the macroeconomic balance (MB) approaches along the lines of Ca' Zorzi et al. (2022).[13]

2 Three methods for assessing equilibrium exchange rates

Equilibrium exchange rate models are employed to decompose the real exchange rate (rer) into its equilibrium (rer^{eq}) and misalignment (rer^{mis}) components:

$$rer = rer^{eq} + rer^{mis}$$

The split between the two components depends in part on the time horizon that is used. As discussed by Driver and Westaway (2005), exchange rate movements are driven by long, medium and short-term economic fundamentals and by an unexplained component.[14] The approach taken in this article is to distinguish between movements of the equilibrium exchange rates, and movements of the exchange rate *around* the equilibrium. The former are driven by long and medium-term economic fundamentals, while the latter are driven by short-term fundamentals and an unexplained component. This is consistent with theoretical general

11 Ca' Zorzi, M., Kolasa, M. and Rubaszek, M., "Exchange rate forecasting with DSGE models", *Journal of International Economics*, Vol. 107, 2017, pp. 127–146.

12 Eichenbaum, M., Johannsen, B.K. and Rebelo, S., "Monetary policy and the predictability of nominal exchange rates", *The Review of Economic Studies*, Vol. 88, 2020, pp. 192–228.

13 In particular, this Economic Bulletin article updates the results that are described in detail in the study by Ca' Zorzi, M., Cap, A., Mijakovic, A. and Rubaszek, M., "The reliability of equilibrium exchange rate models: A forecasting perspective", *International Journal of Central Banking*, forthcoming. A previous version of this paper is available as ECB Working Paper No 2358.

14 Driver, R. and Westaway, P., "Concepts of equilibrium exchange rates", *Bank of England Working Paper*, No 248, Bank of England, 2005.

equilibrium models,[15] in which over the business cycle fluctuations in exchange rates around their equilibria are partly driven by central banks' relative monetary policy stance, adjusted for risk premia.[16] The definition of equilibrium exchange rates is hence important from a monetary policy perspective.

The first equilibrium exchange rate model considered here is the PPP model, i.e. the oldest theory of real exchange rate determination, which was restored to prominence in modern times by Gustav Cassel and is still today a key benchmark for determining exchange rate parities in fixed exchange rate regimes.[17] In a nutshell, the PPP model starts from the law of one price, which states that international arbitrage helps to equalise the price of any tradable product denominated in a common currency. The concept of strong PPP emerges from applying this law to consumption baskets, i.e. the same basket of goods should cost the same across countries when denominated in a common currency. In contrast, the weak version of PPP theory states that, in equilibrium, the relative cost of the same basket of goods across countries is constant over time but might deviate from unity owing to factors such as taxes and/or transportation costs. The weak version of PPP is empirically more relevant and appealing from a practical perspective, as it implies that a long-run sample mean of the real exchange rate is a good proxy for the PPP-based equilibrium real exchange rate.

The BEER model generalises PPP theory by assuming that persistent PPP deviations should not be treated as "disequilibria" if they are driven by economic fundamentals. In other words, while the PPP model suggests that the long-term equilibrium exchange rate is a constant, in the BEER model the medium-term equilibrium fluctuates over time in line with changes in a set of economic fundamentals. In practice, the level of the BEER is estimated from a regression linking the real exchange rate to a set of economic variables indicated by economic theory considerations (Fell, 1996; MacDonald, 1998; Maeso-Fernandez et al., 2001; and Lee et al., 2008).[18] The literature has discussed at length the best choice of fundamentals for the BEER and the expected sign and magnitude of the parameters (for a comprehensive literature review, see Fidora et al., 2017).[19] In this analysis the choice of economic fundamentals is limited to three key ones: relative per capita GDP, net foreign assets and the terms of trade. All three variables aim to explain medium and long-term exchange rate movements while, as discussed above, the analysis does not include real interest rate differentials, fiscal variables or other

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15 Examples of these models are found in Ca' Zorzi, M., Kolasa, M. and Rubaszek, M., 2017, op. cit.; Eichenbaum, M., Johannsen, B.K. and Rebelo, S., 2020, op. cit.; and Itskhoki, O. and Mukhin, D., "Exchange rate disconnect in general equilibrium", *Journal of Political Economy*, Vol. 129(8), 2021.

16 This notion is implicit in the uncovered interest rate parity as discussed in Engel, C., "Exchange rates, interest rates, and the risk premium", *American Economic Review*, Vol. 106, 2016, pp. 436-474.

17 Cassel, G., "Abnormal deviations in international exchanges" *Economic Journal*, December 1918, pp. 413–415.

18 Fell, J., "Balance of payments equilibrium and long-run real exchange rate behaviour", mimeo, European Monetary Institute, 1996; MacDonald, R., "What determines real exchange rates?: The long and the short of it", *Journal of International Financial Markets, Institutions and Money*, Vol. 8, 1998, pp. 117–153; Maeso-Fernandez, F., Osbat, C. and Schnatz, B., "Determinants of the Euro Real Effective Exchange Rate: A BEER/PEER Approach", *Australian Economic Papers*, Vol. 41(4), 2002, pp. 437–461; Lee, J., Ostry, J.D., Prati, A., Ricci, L.A. and Milesi-Ferretti, G.M., "Exchange Rate Assessments: CGER Methodologies", *IMF Occasional Papers*, No 261, International Monetary Fund, 2008.

19 Fidora, M., Giordano, C. and Schmitz, M., "Real exchange rate misalignments in the euro area", *Working Paper Series*, No 2108, European Central Bank, 2017.

short-term factors. In most of the literature it is taken for granted that a rise in relative per capita GDP (gdp) leads to an appreciation of the real exchange rate. The explanation is twofold. From a demand perspective, an increase in relative income should lead to stronger demand for domestic non-traded goods and hence to an increase in their price relative to traded goods, i.e. a real exchange rate appreciation. The supply perspective is based on the Balassa-Samuelson effect, which suggests that a relative increase in productivity in the production of tradable goods leads to an increase in gdp and a real exchange rate appreciation (Lee et al., 2013; and Zhang, 2017).[20] Another frequently cited explanation for long-run trends in equilibrium real exchange rates emphasises the role of net foreign assets (nfa). The rationale is that a rise in nfa increases the interest income on the current account that must be counterbalanced by a trade balance deterioration, requiring in turn a real exchange rate appreciation (Lane and Milesi-Ferretti, 2002).[21] The terms of trade (tot) is the third most used explanatory variable in BEER regressions. A rise in tot should lead to an improved trade balance, and therefore a real exchange rate appreciation is needed to restore the trade balance to its initial level. For the above reasons we estimate the level of the BEER with the specification used by Faruqee (1995) and Lane and Milesi-Ferretti (2004),[22] so that the value of the BEER for country i in period t is given by:

$$rer_{it}^{BEER} = \mu_i + \alpha_1 gdp_{it} + \alpha_2 nfa_{it} + \alpha_3 tot_{it} \quad (1)$$

where all explanatory variables are expressed relative to a trade-weighted average of foreign values and the estimated signs of the regression match the theoretical predictions.

The MB approach defines equilibrium exchange rates from a current account sustainability perspective. The methodology of the MB approach differs substantially from that of the PPP and BEER models. Instead of estimating an equilibrium exchange rate, the MB approach estimates or calibrates/postulates an equilibrium current account (or norm) and the current account gap, i.e. the distance of the current account from this norm.[23] It then seeks to estimate or calibrate a relationship between the current account balance and the real exchange rate in order to establish to what degree the real exchange rate needs to adjust so as to close the current account gap. For that reason, this definition is closely connected with the debate on global (current account) imbalances and the role played by the exchange rate in unwinding them. Technically, to calculate the equilibrium exchange

[20] Lee, J., Milesi-Ferretti, G.M. and Ricci, L.A., "Real exchange rates and fundamentals: A cross-country perspective", *Journal of Money, Credit and Banking*, Vol. 45, 2013, pp. 845–865; and Zhang, Q., "The Balassa-Samuelson relationship: Services, manufacturing and product quality", *Journal of International Economics*, Vol. 106, 2017, pp. 55–82.

[21] Lane, P.R. and Milesi-Ferretti, G.M., "External wealth, the trade balance, and the real exchange rate", *European Economic Review*, Vol. 46, 2002, pp. 1049–1071.

[22] Faruqee, H., "Long-run determinants of the real exchange rate: a stock-flow perspective", *IMF Staff Papers*, Vol. 42, 1995, pp. 80–107; Lane, P.R. and Milesi-Ferretti, G.M., "The transfer problem revisited: Net foreign assets and real exchange rates", *The Review of Economics and Statistics*, Vol. 86, 2004, pp. 841–857. As explained in Lane and Milesi-Ferretti, this specification represents a long-run cointegration relationship, necessitating panel cointegration estimators.

[23] See Williamson, J., (ed.) *Estimating Equilibrium Exchange Rates*, Institute for International Economics, 1994; and Lee et al. (2008), op. cit.

rate with the MB framework, three issues must be addressed. The first consists of projecting the level at which the current account balance would stabilise if exchange rates remained unchanged and output gaps were closed ($\widetilde{ca}$). The second relates to setting the current account norm (ca^{norm}), which is typically estimated using a panel data regression with similar fundamentals to those chosen for the above-mentioned BEER regressions. The third is estimating how changes in the real exchange rate affect the current account (elasticity η). Addressing these issues as in Ca' Zorzi et al. (2022),[24] the equilibrium exchange rate (rer_{it}^{MB}) can then be simply computed as:

$$rer_{it}^{MB} = rer_{it} - \frac{\widetilde{ca}_{it} - ca_{it}^{norm}}{\eta_{it}} \quad (2)$$

Equation (2) reveals the critical role played by the current account elasticity η, which measures the current account adjustment in response to a 1% exchange rate appreciation. For example, doubling the value of this elasticity would halve the exchange rate adjustment required to bring back the long-run value of the current account ($\widetilde{ca}$) to its norm (ca^{norm}). The academic literature has shown that the value of the current account elasticity is uncertain and dependent on some critical assumptions about the extent to which exchange rate changes pass through to export and import prices.[25]

In terms of country coverage, the analysis in this article includes the group of advanced economies that issue so-called G10 currencies, namely Australia (AU), Canada (CA), Switzerland (CH), the euro area (EA),the United Kingdom (UK), Japan (JP), Norway (NO), New Zealand (NZ), Sweden (SE) and the United States (US) and our quarterly dataset spans the period between the first quarter of 1975 and the fourth quarter of 2020. Such a sample is comparable to those used in studies evaluating exchange rate trading strategies for the ten globally most traded currencies (e.g. Opie and Riddiough, 2020), as well as recent studies on exchange rate forecasting (e.g. Engel and Wu, 2021).[26] There are two additional criteria for the country selection, namely the presence of flexible exchange rate regimes for most of the sample and the availability of sufficient macroeconomic data for a meaningful forecast evaluation exercise.[27] A full description of the data sources, estimated

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[24] This consists in forecasting the underlying current account with an RW model, defining the current account norm based on a panel regression and choosing appropriate current account elasticities.

[25] For evidence of the large amount of uncertainty surrounding the estimation of trade elasticities, see Bussière at al. (2010), op. cit. For the baseline we have assumed producer currency pricing. This means that export prices do not react to exchange rate changes, whereas import prices are affected one-to-one, implying perfect pass-through. Given the large estimation uncertainty regarding the magnitude of foreign trade elasticities, we followed the literature and set the long-run price elasticities equal to minus one. These assumptions translate into a set of elasticities that are both country- and time-dependent as they are a function of import and export shares. For evidence of the impact on the forecasting performance of the three models using different currency pricing assumptions, see Ca' Zorzi et al. (2022), op. cit.

[26] Opie, W. and Riddiough, S.J., "Global currency hedging with common risk factors", *Journal of Financial Economics*, Vol. 136, 2020, pp. 780–805; and Engel, C. and Wu, S.P.Y. (2021), op. cit.

[27] For each of the ten analysed economies, the foreign sector is represented by the other nine countries plus Denmark, which is excluded from the analysis owing to its fixed exchange rate regime. The weights are computed based on the narrow effective exchange rate index published by the Bank for International Settlements (BIS). We take BIS weights for the year 1995 and adjust them so that they sum to unity. The exact values are presented in Table 1 in Ca' Zorzi et al. (2022), op. cit., and cover 75% to 96% of the BIS index.

regressions and equilibrium exchange rate estimates is available in Ca' Zorzi et al. (2022), which for the purpose of this article was updated to the fourth quarter of 2020.

3 In-sample adjustment

A key question considered in our analysis is to what extent the euro, the US dollar and other major currencies tend to converge to their long-run exchange rate equilibria. For each equilibrium exchange rate model, currency and horizon h we estimate the parameters of the local projection regression:

$$rer_{t+h} - rer_t = \alpha_h - \beta_h(rer_t - rer_t^{eq}) + \epsilon_{t+h} \quad (3)$$

in which the parameter β_h measures the average fraction of misalignment eliminated at horizon h. If the real exchange rate reverts to its equilibrium over time, the value of β_h should converge to 1 as h increases. In parallel, we estimate the local projection:

$$ner_{t+h} - ner_t = \gamma_h - \delta_h(rer_t - rer_t^{eq}) + \eta_{t+h} \quad (4)$$

which enables the extent to which the nominal exchange rate accomplishes the required adjustment to be evaluated.

The evidence points to a clear tendency for exchange rates to converge to their equilibrium and for the pace of the convergence to be model-dependent. In Table 1, for each country the first line reports the fraction of the real exchange rate misalignment absorbed by the real exchange rate change (β_h) and the second line reports the fraction absorbed by the nominal exchange rate change (δ_h) at each horizon h.

Table 1

Fraction of the adjustment achieved by the real and nominal exchange rates relative to the initial misalignment across models

		PPP	BEER	MB	PPP	BEER	MB
		1-quarter horizon			4-quarter horizon		
Euro	real exchange rate	0.07**	0.07**	0.00	0.28***	0.31***	0.01
	nominal exchange rate	0.05*	0.05*	0.01	0.23**	0.24**	0.03
US dollar	real exchange rate	0.05*	0.06**	0.05***	0.20**	0.26**	0.18***
	nominal exchange rate	0.04	0.05	0.05***	0.16*	0.22**	0.20***
Panel	real exchange rate	0.05***	0.06***	0.04***	0.20***	0.25***	0.12***
	nominal exchange rate	0.04***	0.06***	0.04***	0.18***	0.24***	0.15***
		12-quarter horizon			20-quarter horizon		
Euro	real exchange rate	0.72***	0.79***	0.00	1.10***	1.23***	0.10**
	nominal exchange rate	0.63***	0.68***	0.05	1.03***	1.14***	0.06
US dollar	real exchange rate	0.74***	0.90***	0.48***	1.25***	1.49***	0.68***
	nominal exchange rate	0.69***	0.84***	0.52***	1.24***	1.48***	0.72***
Panel	real exchange rate	0.56***	0.69***	0.24***	0.72***	0.86***	0.26***
	nominal exchange rate	0.54***	0.68***	0.33***	0.73***	0.90***	0.38***

Source: Authors' calculations.
Notes: The table presents the estimates of adjustment parameters β_h and δ_h from regressions (3) and (4). Asterisks $***$, $**$ and $*$ denote respectively the 1%, 5% and 10% significance levels. The panel comprises all of the G10 currencies.

Four interesting findings are evident from Table 1:

First, the adjustment of the real exchange rate starts almost immediately. In the case of the PPP model, for example, in one quarter the real exchange rate moves to absorb 7% of the real exchange rate misalignment for the euro and 5% for both the US dollar and the full panel of G10 currencies.[28] The adjustment is similar and marginally stronger in the case of the BEER model. It is remarkable that within the short horizon of one quarter a small fraction of the required exchange rate adjustment is already accomplished. It is hence not the case – despite being often stated – that short-run exchange rate movements are entirely unpredictable. The adjustment toward equilibrium is very slow but starts well before the one-year horizon.

Second, nominal exchange rate changes are at least in part predictable. The reason for this is that the required real exchange rate adjustment takes place via currency movements and not via an adjustment in relative prices across countries. This is apparent from the observation that the fraction of adjustment completed by the nominal exchange rate δ_h is almost as sizeable as the fraction achieved by β_h.[29] In the case of the PPP model, the numbers are only slightly lower than for the real exchange rate: the nominal exchange rate absorbs 5% of the real exchange rate misalignment in the case of the euro and 4% for both the US dollar and on average for the panel. This is true across different models and horizons

[28] The panel results are estimated using fixed effects for the ten countries in the sample and correcting errors for autocorrelation and heteroskedasticity.

[29] For the PPP model the ratio of nominal to real adjustment, δ_h/β_h tends to be below unity, which means that a small fraction of the real exchange rate adjustment is completed by relative inflation.

irrespective of the degree of exchange rate predictability, which differs across models.

Third, the pace of the adjustment toward the equilibrium varies considerably across models. With the PPP model, within three years the real exchange rate absorbs 72% of the required adjustment for the euro, 74% for the US dollar and 56% for the full panel of G10 currencies. However, the pace of adjustment is not the same for different equilibrium exchange rate concepts. It is somewhat stronger for the BEER model: within three years 79% of the adjustment is completed for the euro, 90% for the US dollar and 69% for the full panel.[30]

Fourth, the pace of the real exchange rate adjustment is much weaker with the MB model. After three years it is basically nil for the euro, 48% for the US dollar and only 24% for the full panel. This suggests that the in-sample explanatory power of equilibrium exchange rates estimated with the current account-based model is overall very poor. A similar pattern emerges if we focus on the adjustment of the nominal exchange rate (see Table 1).

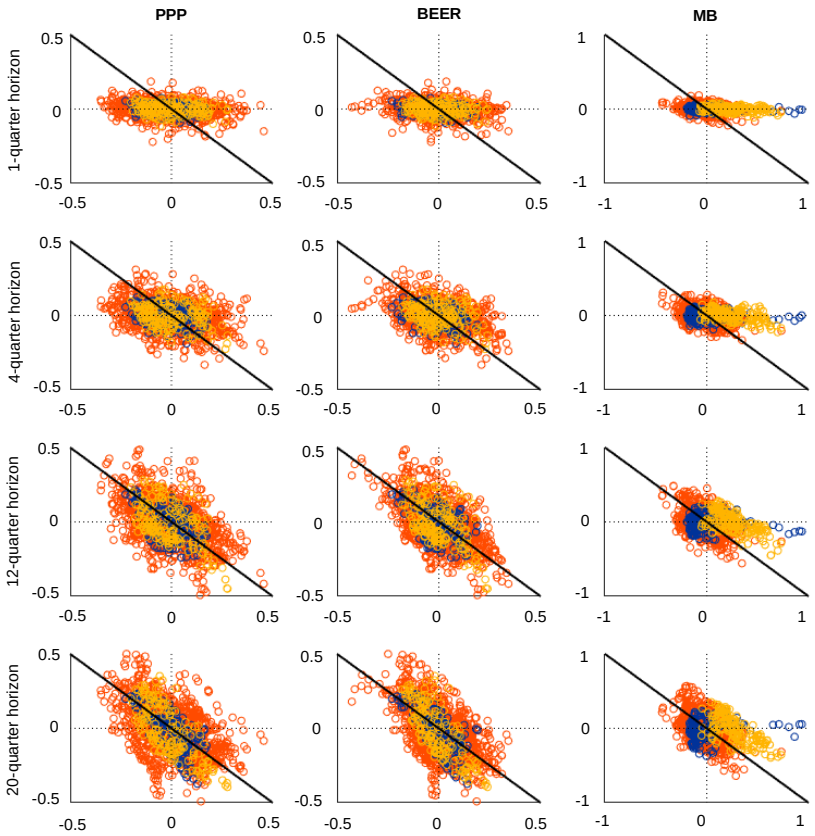
Finally, there is an elegant graphical equivalent way to show that nominal exchange rates over time absorb past exchange rate misalignments. Below we produce a set of scatter plots showing nominal exchange rate changes at different horizons against the initial real exchange rate misalignment, i.e. the deviation of the real exchange rate from its model-consistent equilibrium value. To the extent that there is an adjustment, this relationship should be negative, and, in the case of full adjustment accomplished by the nominal exchange rate and no movements in the equilibrium exchange rate, the slope of the regression should be equal to minus one. Chart 1 shows the results for the three models at different time horizons, indicating with yellow circles the observations for the US dollar, with blue circles those for the euro and with red circles those for all other G10 currencies.

[30] At the four-year horizon there is evidence of overshooting in the case of the euro and the US dollar, suggesting that the estimated misalignment flips in the opposite direction.

Chart 1

Scatter plot of nominal exchange rate changes vs. misalignments for the euro, the US dollar and all other G10 currencies

(percentage changes)



Source: Authors' calculations.
Notes: The x-axis of the chart represents deviations of real effective exchange rates from their full-sample equilibrium, whereas the y-axis represents subsequent real exchange rate adjustments. The US dollar and the euro are marked with yellow and blue circles respectively. All other G10 currencies are marked with red circles. The diagonal line represents perfect adjustment to the equilibrium.

The chart confirms visually that for both the PPP and BEER models there is an adjustment mechanism at play, which ensures that the initial real exchange rate misalignment is absorbed through a nominal exchange rate movement. This is already visible at the one-year horizon and becomes particularly evident at longer horizons. For the MB model the adjustment is again much weaker and visible only for the US dollar at the five-year horizon.

4 Out-of-sample evidence

The evidence that exchange rates converge to their long-term equilibria begs the key question: can this information be exploited to forecast real and nominal exchange rates? To find the answer, in the next step we evaluate the out-of-sample forecast accuracy for horizons ranging from one to 20 quarters ahead in

the period from the first quarter of 1995 to the fourth quarter of 2020 on the basis of our full panel of data. In particular, for each vintage period *s*, the local projection regressions (5) and (6) are employed to calculate forecasts for real and nominal exchange rates:

$$rer_{s+h}^{f} = rer_s + \alpha_{h|s} - \beta_{h|s}\left(rer_s - rer_{s|s}^{eq}\right) \quad (5)$$

$$ner_{s+h}^{f} = ner_s + \gamma_{h|s} - \delta_{h|s}\left(rer_s - rer_{s|s}^{eq}\right) \quad (6)$$

where $\alpha_{h|s}$, $\beta_{h|s}$, $\gamma_{h|s}$, $\delta_{h|s}$, and $rer_{s|s}^{eq}$ are the parameters and equilibrium exchange rate estimates based on a sample ending in period s.

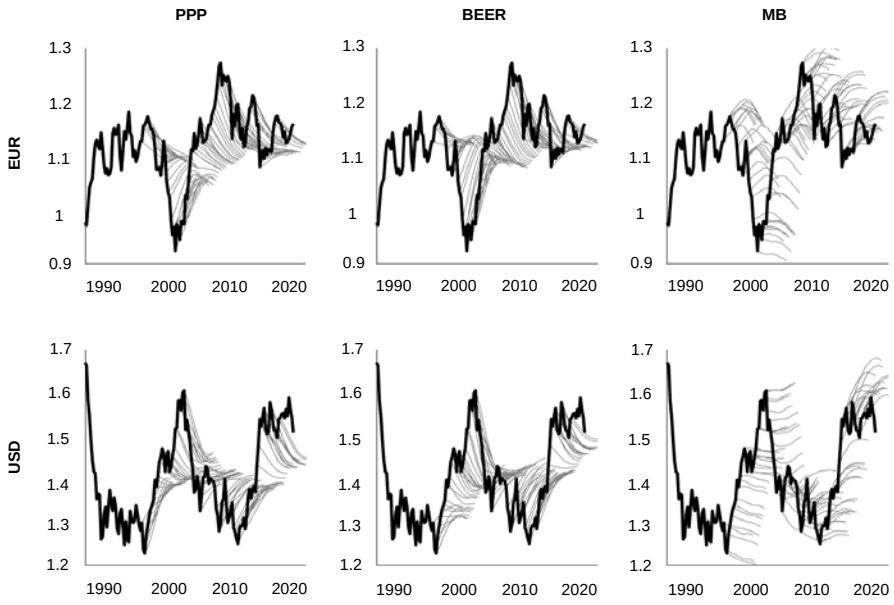
The chart showing sequential forecasts illustrates the predictive content of three equilibrium exchange rate models and immediately indicates that the PPP and BEER models perform relatively well. Chart 2 presents sequential forecasts for the US dollar and the euro. It shows that by predicting a gradual reversion of the real exchange rate to the corresponding equilibrium, the PPP and BEER models both usually deliver relatively accurate forecasts. By contrast, the MB model performs poorly[31] as forecasts obtained from this model are only weakly correlated with subsequent outcomes.[32]

[31] A similar result is found by Yesin (2016). See Yesin, P., "Exchange rate predictability and state-of-the art models", *SNB Working Paper Series*, No 2/2016, Swiss National Bank, 2016.

[32] This can be explained by two factors: high volatility of the MB-implied equilibria and low estimates of the adjustment parameter β_h, which suggests that there is limited convergence to equilibrium for current account-based equilibrium exchange rate models. If β_h is close to nil, forecasts calculated with equation (4) resemble those that would be obtained using an RW model with a drift, which is the case for the MB model. This confirms our in-sample insight of a very limited adjustment of exchange rates toward equilibrium exchange rate estimates when the latter are derived with the MB model.

Chart 2
Sequential forecasts

(log of the real effective exchange rate)

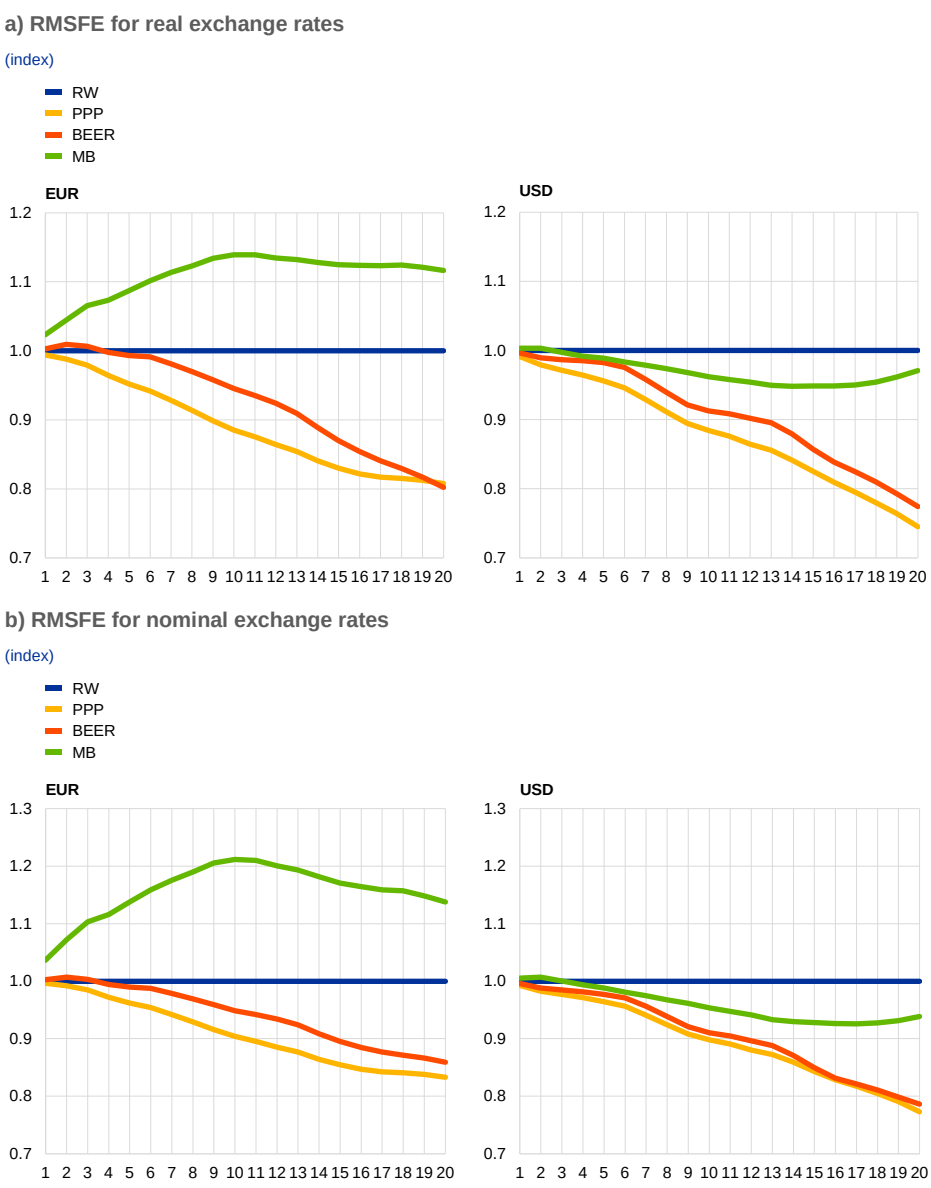


Source: Authors' calculations.
Note: The black line represents the actual outcome while the grey lines represent the 20-quarters ahead forecast calculated at different points in time.

The above anecdotal evidence on the relative performance of the three models can also be shown more formally vis-à-vis the RW benchmark. To this end, in Chart 3 we plot an indicator of the performance of each model (i.e. the root mean squared forecast error – RMSFE) measured relative to the performance of the RW model. If this indicator is below unity, the model concerned delivers more accurate forecasts than those obtained using the simple assumption of an unchanged exchange rate.

Chart 3

RMSFE of the euro and the US dollar at different horizons across different models relative to the RW benchmark



Source: Authors' calculations.
Notes: The chart shows on the y-axis the ratios of the root mean squared forecast error from the models in comparison with the RW benchmark. The x-axis is ordered in terms of quarterly horizons.

The findings confirm that the PPP and BEER models perform well in relative terms while the MB model performs poorly for the euro area. In the cases of the euro and the US dollar, the PPP model (yellow line) and the BEER model (red line) clearly outperform the RW model (blue line) in terms of forecasting both real (Chart 3, panel a) and nominal (Chart 3, panel b) exchange rates, as this indicator of forecasting performance is always below the threshold of 1. Interestingly, for the PPP model the result is already statistically significant at the one-year horizon. The MB model (green line) conversely fails to outperform the RW model in the case of the

euro, while it outperforms the RW model for the US dollar at horizons longer than one year.

More mixed results are obtained for other G10 currencies. Table 2 presents the results for all countries that issue G10 currencies, with nominal and real exchange rates at the four-quarter and 20-quarter horizons. The results at short horizons show that equilibrium-based model forecasts beat the RW model forecasts approximately half of the time, albeit in only in a few instances in a significant way. However, at the longer, 20-quarter horizon, the PPP and BEER models show a stronger forecast performance than the RW model, while the MB model is generally inaccurate.[33] The PPP model is the best performing among the three models participating in the forecasting competition.

[33] A similar result is found in Yesin (2016), op. cit. The analysis shows that, despite the usefulness of the MB model in the context of the global imbalances debate, the BEER model has stronger forecasting properties.

Table 2

RMSFE for real and nominal exchange rates across different models relative to the RW benchmark; estimated adjustment path

	PPP (estimated)	BEER (estimated)	MB (estimated)	PPP (estimated)	BEER (estimated)	MB (estimated)
Real exchange rate	**4-quarter horizon**			**20-quarter horizon**		
AU	1.01*	0.91**	1.05	1.06**	0.55***	1.24
CA	0.99*	1.00*	1.01	0.84***	0.73***	1.11
CH	1.02	1.11	1.06	1.14	1.26	1.02
EA	0.96**	1.00	1.07	0.81***	0.80***	1.12
UK	0.95***	1.05*	1.00	0.80***	1.14	1.05
JP	0.94**	0.88***	1.03	0.90***	0.66***	1.10
NO	0.95**	1.30	0.99*	0.86***	2.59	0.95**
NZ	1.02	0.98*	1.00	0.98**	0.84***	0.97*
SE	1.14	1.09	1.01	1.61	1.19	0.87***
US	0.96**	0.99*	0.99*	0.75***	0.77***	0.97
Nominal exchange rate	**4-quarter horizon**			**20-quarter horizon**		
AU	1.04	0.92**	1.08	1.23**	0.66***	1.43
CA	0.99*	0.98*	1.01	0.81***	0.77***	1.11
CH	0.97**	1.06	1.08	0.83***	0.95*	0.88***
EA	0.97*	0.99	1.12	0.83***	0.86***	1.14
UK	0.99*	1.05	1.02	0.87***	1.11*	1.00
JP	1.00	0.95**	1.05	1.13**	0.85***	1.20
NO	0.96**	1.21	0.97**	0.87**	1.95	0.84**
NZ	1.14	1.10	1.02	1.56	1.43	1.22
SE	1.03	1.07	1.01	1.08	1.19*	1.16*
US	0.97**	0.98*	0.99*	0.77***	0.79***	0.94**

Source: Authors' calculations.
Notes: The table shows the ratios of the root mean squared forecast error from the models in comparison with the RW benchmark, where values below unity indicate that forecasts from the respective model are more accurate than those from the benchmark. Asterisks ***, ** and * denote respectively the 1%, 5% and 10% significance levels of the Clark-West test, where the long-run variance is calculated with the Newey-West method.

The analysis highlights that the RW model still remains a strong contender, which is most likely due to the role of estimation error. Indeed, the effort made to estimate the pace of the adjustment to equilibrium with the local projection regressions (5) and (6) has not been very helpful in terms of forecasting. To show this, the previous exercise can be repeated with the only differences being that (i) this time the nominal exchange rate moves to ensure a movement of the real exchange rate toward its equilibrium value and that (ii) such adjustment is calibrated to be rather slow in line with the real exchange rate literature. Table 3 reports the results for a half-life adjustment of three years, but the results are valid for the wider range of between two and a half years and five years, while for half-lives longer than five years the forecasts are almost the same as those given by the RW model.

Table 3

RMSFE for real and nominal exchange rates across different models relative to the RW benchmark; adjustment calibrated with a half-life of three years

	PPP (calibrated)	BEER (calibrated)	MB (calibrated)	PPP (calibrated)	BEER (calibrated)	MB (calibrated)
Real exchange rate	**4-quarter horizon**			**20-quarter horizon**		
AU	0.98**	0.91**	1.05	0.92***	0.63***	1.27
CA	0.99*	0.98*	0.98**	0.80***	0.78***	0.85***
CH	1.04	1.07	1.08	1.12	1.13	1.17
EA	0.95**	0.96*	1.13	0.77***	0.78***	1.26
UK	0.95***	0.99**	0.98	0.78***	0.97**	0.93**
JP	0.91**	0.89***	1.03	0.79***	0.67***	1.02*
NO	0.96**	1.11	1.07	0.86***	1.81	1.51**
NZ	1.02	0.97*	0.97**	0.98**	0.86***	0.99*
SE	1.19	1.08	1.19	1.74	1.30	1.80
US	0.96**	0.96**	1.11	0.77***	0.79***	1.19*
Nominal exchange rate	**4-quarter horizon**			**20-quarter horizon**		
AU	0.99***	0.95**	1.04	0.95***	0.79***	1.28
CA	0.99***	0.98*	0.98**	0.79***	0.78***	0.85***
CH	1.11	1.13	1.07	1.19	1.17	1.09
EA	0.96**	0.97*	1.13	0.77***	0.79***	1.32
UK	0.97***	1.02	0.97*	0.85***	1.04	0.87***
JP	0.92**	0.93**	1.02	0.86***	0.85***	0.95***
NO	0.98*	1.14	1.06*	0.94*	1.68	1.37*
NZ	1.01	0.97*	0.97**	0.96***	0.84***	0.97**
SE	1.17	1.08	1.15	1.65	1.24	1.72
US	0.95**	0.96**	1.05	0.77***	0.78***	0.99**

Source: Authors' calculations.
Notes: The table shows the ratios of the root mean squared forecast error from the models in comparison with the RW benchmark, where values below unity indicate that forecasts from the respective model are more accurate than those from the benchmark. Asterisks ***, ** and * denote respectively the 1%, 5% and 10% significance levels of the Clark-West test, where the long-run variance is calculated with the Newey-West method.

The forecasting power of the PPP equilibrium exchange rate (i.e. the sample mean) becomes fully evident in this setting. The PPP model beats the RW benchmark seven times out of ten in real exchange rate forecasting and eight times out of ten in nominal exchange rate forecasting. The performance of the BEER model is almost as good as that of the PPP model, but not better as it is also affected by other sources of estimation error. The predictive power of the MB model is generally considerably worse than that of the other two models.

An additional insight gained from this result is that most of the forecasting power that the models possess relative to the RW benchmark arises directly from the mean-reverting properties of the real exchange rate.[34] It is enough to

[34] A similar conclusion is reached by Engel and Wu (2021), op. cit., by showing that the mean-reverting property of the bilateral US dollar exchange rate can be exploited in nominal exchange rate forecasting, while additional explanatory variables, like the risk premium, do not improve the predictability of the nominal exchange rate out-of-sample.

set up a simple “rule of thumb”, whereby the nominal exchange rate gradually moves to restore the real exchange rate to its mean, in order to outperform the RW model and most other models. In summary, PPP is both a competitive model in terms of equilibrium exchange rate estimation and an accurate benchmark for real and nominal exchange rate forecasting. The BEER model has good in-sample properties and a similar out-of-sample performance. Conversely, the MB model is highly unreliable in predicting future exchange rate changes.

5 Concluding remarks

Exchange rates are not a policy target for major central banks but are an important variable in their information set. They are important because anticipating their future movements could help to gauge the transmission mechanism of monetary policy. And they are important because sharp, large deviations from fair values could presage a large adjustment with potentially adverse repercussions for the outlook for inflation and for output. This article has presented an analysis bringing together the literature on equilibrium exchange rates and exchange rate forecasting. Several important, unexpected lessons can be drawn from an analysis of the predictive power of equilibrium exchange rate models.

The first is that in-sample, on average, real exchange rates tend to slowly converge to their equilibria if the latter are defined by the PPP or BEER models. This is not the case for equilibrium exchange rate models based on the current account. The equilibrium exchange rate estimates based on such models tend to be unstable and unreliable in explaining real exchange rate movements.

The second is that this convergence property can be exploited to forecast not only real exchange rates but also nominal exchange rates. The reason is intuitive as most of the adjustment toward equilibrium is achieved by a currency movement and not through relative price changes across countries. While the RW model remains, in some cases, a formidable competitor, the PPP and BEER models can help to forecast future exchange rate movements. The MB model estimates conversely are not indicative of future exchange rate movements.

The third is that most of the forecasting power comes from the mean-reverting properties of real exchange rates rather than from exploiting the relationship between exchange rates and economic fundamentals. While the notion of PPP is much more compatible with economic theory and hence offers reassurance as to the usefulness of macroeconomic theory and the role of the exchange rate in the transmission of monetary policy, the original insight of Meese and Rogoff (1983) – that the future path of exchange rates cannot easily be better extrapolated from economic models than by using a “rule of thumb” – remains largely true. In this article we have qualified this result by suggesting that the most competitive “rule of thumb” is often one which foresees a gradual adjustment of the exchange rate to restore the real exchange rate to its mean value rather than one that assumes “no change”. The key fundamentals that need to be known for out-of-sample forecasting are the real and nominal exchange rates, while there is relatively little information to

be extracted from other economic fundamentals in normal times. Large current account surpluses or deficits may influence the path of adjustment of the exchange rate but, in line with theory, they have a limited influence on the long-term value of the exchange rate.

2 Key factors behind productivity trends in euro area countries

Prepared by Paloma Lopez-Garcia and Bela Szörfi

1 Introduction

Productivity, defined broadly as efficiency in production, plays a key role in the economic resilience and social welfare of countries.[1] Productivity growth influences the economy in important ways, affecting key variables such as output, employment and wages. Productivity is also relevant for monetary policy as it is a fundamental determinant of potential output growth and the natural rate of interest and, therefore, of the monetary policy space needed to deliver price stability over the medium term. As such, changes in productivity can influence the transmission mechanism of monetary policy and should be closely monitored.

The primary responsibility for enhancing productivity growth lies with national policies. National fiscal and structural policies can strengthen productivity growth by fostering greater efficiency in product, labour and financial markets, thereby providing the means and incentives for productive firms to thrive. High-quality education and public administration and the rule of law are also important institutional prerequisites for a competitive business environment, which in turn facilitates technological progress and increases incentives to invent and innovate. National governments therefore have ample scope to set the right framework conditions and incentives for productive investment and innovation decisions that determine long-term productivity growth. Cyclical polices, including monetary policy, may also support productivity growth under certain circumstances by increasing demand and stimulating investment.

Global trends, such as population ageing and the slowdown in the pace of globalisation, have a bearing on productivity developments. Globalisation can increase productivity growth through a variety of channels, namely: i) enhancing export opportunities and market competition;[2] ii) promoting "learning by exporting";[3]

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1 Productivity can be defined in several ways. From a single-factor perspective, labour productivity is defined as units of output (real GDP or value added) produced per unit of labour input, where labour input can be the number of employed persons or the total hours they work. However, the productivity of any single input of production, such as labour input, depends on the quantity of the other inputs. To capture the efficiency with which all inputs are used, economists use a broader concept of productivity, namely, total factor productivity (TFP), unobservable and computed as a residual. In a production function framework, labour productivity growth is determined by TFP growth and the growth of capital per labour input (capital deepening).

2 See Bustos, P., "Trade Liberalization, Exports, and Technology Upgrading: Evidence on the Impact of MERCOSUR on Argentinian Firms", *American Economic Review*, Vol. 101, No 1, February 2011, pp. 304-340.

3 That is, a firm's efficiency may benefit from knowledge gained through its presence in foreign markets. See De Loecker, J., "Detecting Learning by Exporting", American Economic Journal: Microeconomics, Vol. 5, No 3, August 2013, pp. 1-21.

iii) increasing the variety and quality of production inputs;[4] and iv) improving the allocation of resources across firms.[5] Regarding euro area population ageing, empirical evidence shows that workers' physical abilities and innovativeness decline with age, as does the speed with which they adapt to new technologies.[6] As population ageing causes the share of older workers in the labour force to rise, the above might have negative effects on overall productivity. There are, however, some counterbalancing factors, including increased longevity, more healthy years of life and higher education levels among the older population.

This article looks at the key factors behind productivity developments over recent decades in the euro area. The article summarises the new insights provided by a report drafted for the ECB's strategy review that documents productivity trends and drivers over the past few decades.[7] For a more complete picture, we refer the reader to the full report, which draws from the extensive literature on productivity drivers, existing work within the European System of Central Banks (ESCB), and new analysis. The article is complemented by Box 4 in this issue of the Economic Bulletin, which presents preliminary evidence on the impact of the (coronavirus) COVID-19 pandemic, and of policy responses to it, on productivity.

The article has five sections. Section 2 introduces the most important productivity-related stylised facts, using macroeconomic and sector-level data to set the context. Section 3 uses firm-level data to discuss the key drivers behind productivity growth, distinguishing between those affecting within-firm productivity growth and those affecting the allocation of production factors across firms. Section 4 focuses on the interplay between monetary policy and those drivers of productivity growth. Section 5 offers a few concluding remarks.

2 Key productivity developments in the euro area

This section presents three stylised facts related to productivity growth in the euro area.

First, aggregate labour productivity growth has been trending downwards for decades, both in the euro area and in other major economies. Average annual growth in labour productivity – measured as real GDP per hour worked – in those euro area countries that have sufficiently long time series has continuously declined from about 7% in the 1960s to just 1% since the early 2000s (Chart 1). This decline results from a variety of interacting factors, including global, country-specific, sector-specific, structural and temporary factors, as well as events with potential scarring

4 See Halpern, L., Koren, M. and Szeidl, A., "Imported Inputs and Productivity", *American Economic Review*, Vol. 105, No 12, December 2015, pp. 3660-3703.

5 See Melitz, M.J., "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity", *Econometrica*, Vol. 71, No 6, 2003, pp. 1695-1725.

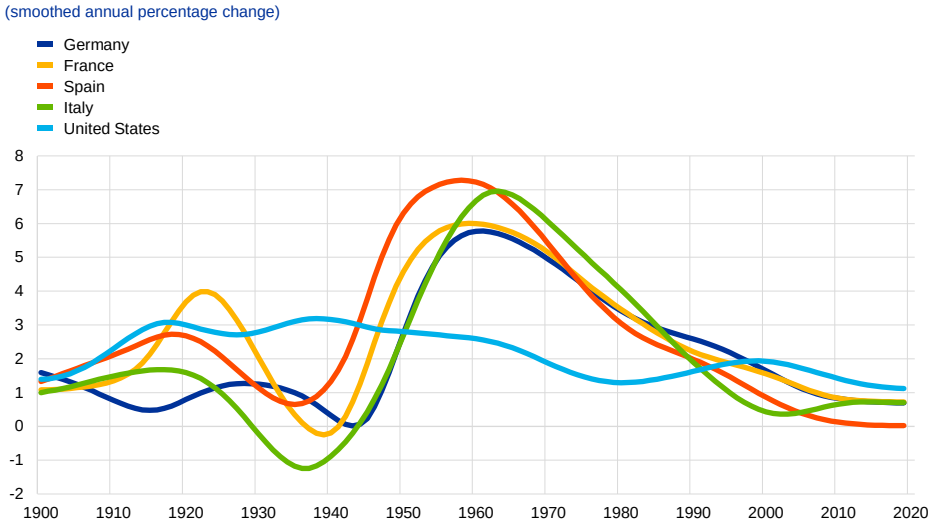
6 See for example Aiyar, S., Ebeke, C. and Shao, X., "The Impact of Workforce Aging on European Productivity", *IMF Working Papers*, WP/16/238, International Monetary Fund, 2016.

7 The report was drafted by experts from 15 national central banks and the ECB. See "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No 268, ECB, September 2021."

effects on productivity and potential output growth, such as the global financial crisis (GFC).

Chart 1

Trends in labour productivity (GDP per hour worked) growth in selected euro area countries and the United States



Sources: Own calculations based on Bergeaud, A., Cette, G. and Lecat, R., "Productivity Trends in Advanced Countries between 1890 and 2012", *Review of Income and Wealth*, Vol. 62, No 3, 2016, pp. 420-444.
Note: The trend is calculated using a Hodrick-Prescott filter with a smoothing parameter lambda of 10.

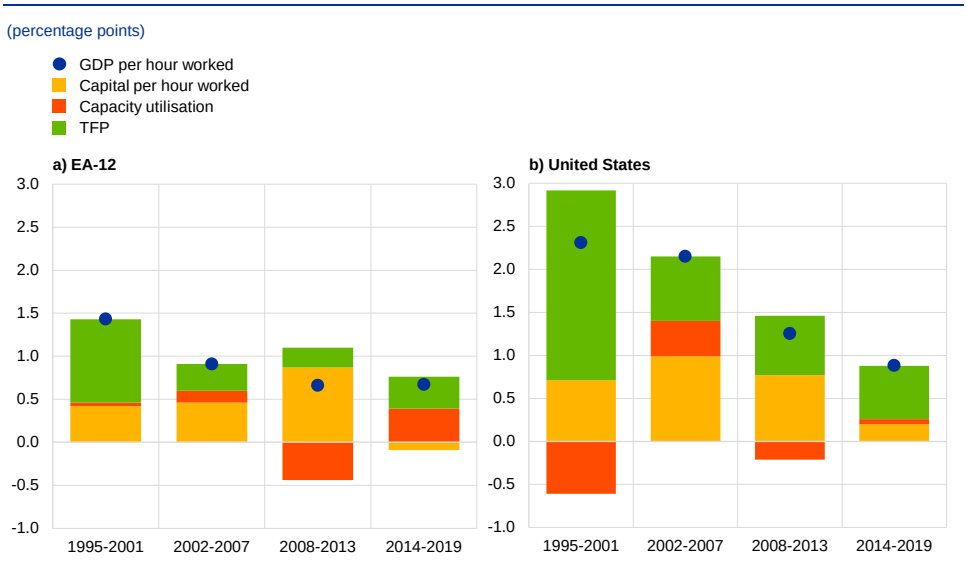
Second, on average across years and countries, total factor productivity (TFP) growth accounts for about 60% of labour productivity growth. By decomposing growth in GDP per hour worked in the 12 countries that adopted the euro in 1999 (EA-12)[8] into capital deepening, capital capacity utilisation and TFP growth, we find that, from 1995 to 2019, TFP growth accounted for about 60% of labour productivity growth on average (Chart 2 – left panel).[9] The contribution of TFP growth, however, has declined over time (from 68% in the period 1995-2001 to 55% in 2014-19). Capital deepening, defined as the change in capital per hour worked, accounted on average for about 40% of labour productivity growth. That average masks a very high contribution during the GFC as a result of the large drop in total hours worked, and a very small negative contribution during the post-GFC period owing to weak investment and employment recovery. Although the average contribution of capacity utilisation over the whole period is rather small, it plays an important role during specific periods. The picture is similar for the United States (Chart 2 – right panel).

8 This selection is data-driven as information on late euro adopters typically starts in 2000. "EA-12" refers to Belgium, Germany, Ireland, Greece, Spain, France, Italy, Luxembourg, Netherlands, Austria, Portugal and Finland.

9 Note that in this standard accounting decomposition, the portion of output that cannot be explained by the amount of inputs used in the production process, also called the "Solow residual", measures TFP growth accurately only if the production function is of the Cobb-Douglas-type, if there is perfect competition on product and factor markets, and if the underlying data adequately capture the required information on quantities and prices. Regarding the latter, quality improvements of capital and labour not adequately captured by the data will be captured by the TFP growth measure.

Chart 2

Contributions to growth in GDP per hour worked in EA-12 and the United States, different periods



Sources: Own calculations based on data from AMECO, Eurostat and (for the United States) the Board of Governors of the Federal Reserve System.
Note: "EA-12" refers to Belgium, Germany, Ireland, Greece, Spain, France, Italy, Luxembourg, Netherlands, Austria, Portugal and Finland. The periods analysed in this article, if possible given data availability, are the pre-euro years (1995-2001), the pre-GFC period (2002-2007), the GFC and sovereign debt crisis (2008-2013) and the post-GFC period (2014 onwards).

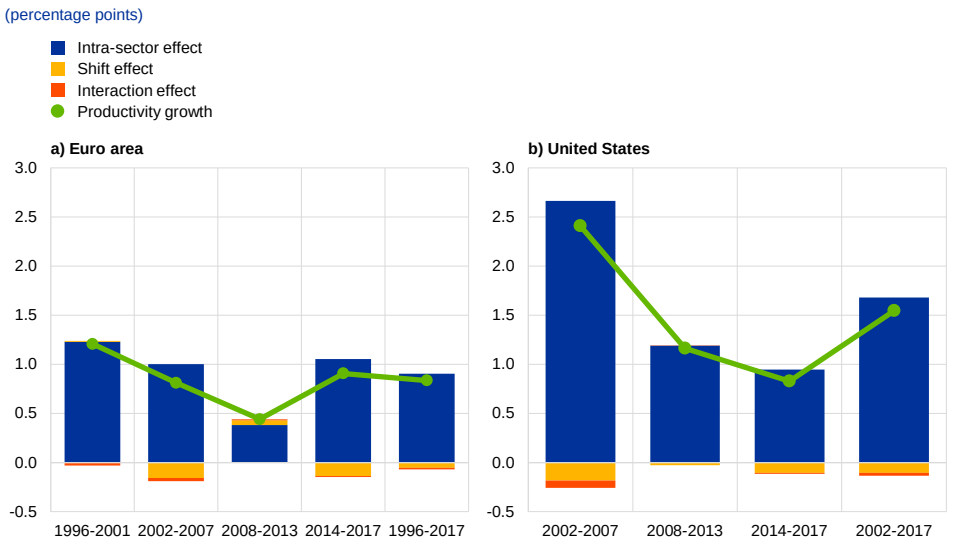
Third, intra-sector dynamics, rather than resource reallocation across sectors, explain a large part of aggregate labour productivity growth. Over time the relative importance – be it in terms of employment or value added share – of the different sectors of activity changes as a result of structural change or sector-asymmetric shocks. To the extent that productivity growth differs across sectors[10], this change in their relative importance can drive aggregate productivity growth. To gauge the importance of cross-sector reallocation of resources for aggregate productivity growth, we use a shift-share analysis and decompose aggregate productivity developments in three parts: first, the "intra-industry effect", which describes the part of productivity growth that results from sector productivity growth, assuming no change in sector weights; second, the structural "shift effect", which describes the impact of changes in sector weights, measured by sectoral employment shares, on aggregate productivity growth, keeping the productivity of each sector constant; and third, the structural "interaction effect", which captures the interrelation between sectoral productivity growth and changes in sectoral employment shares. The sum of the "shift effect" and the "interaction effect' approximate the impact of structural change on productivity growth. We find that, on average over the period 1995-2017, the contribution of structural change to annual

[10] Regarding productivity levels, the utilities sector (electricity, gas and water supply) as well as financial and insurance activities display the highest labour productivity – €77/hour worked and €71/hour worked respectively on average across EU countries in 2017 (due to their high capital intensity). At the other end of the spectrum, construction and accommodation and food services show the lowest productivity level – €27/hour worked and €20/hour worked respectively. Regarding growth rates, cumulative productivity growth between 1997 and 2017 in the information and communication technologies (ICT) sector was about 85% compared to -16% in the accommodation and food service sector.

labour productivity growth was negative and very small (Chart 3 – left panel).[11] This implies that aggregate labour productivity growth has mainly been driven by intra-sector dynamics. This is in line with results from the United States (Chart 3 – right panel) and in related literature.[12] Nevertheless, the impact of sectoral reallocation on productivity might be substantial in certain periods in certain countries, as was the case in the 20th century when agriculture lost weight to manufacturing, or during the GFC given the disproportionate effect that the crisis had on some low-productivity sectors, such as construction.[13]

Chart 3

Shift-share analysis of labour productivity growth, euro area vs. the United States



Sources: Own calculations based on Eurostat and EU-KLEMS, using NACE two-digits data.
Notes: The euro area aggregate includes 14 countries owing to data availability (BE, DE, GR, ES, FR, IT, CY, LT, NL, AT, PT, SI, SK and FI). Agriculture, forestry and fishing (NACE A), mining and quarrying (NACE B), real estate (NACE L), public sector (NACE O-Q) and extraterritorial organisations and bodies (U) are not covered.

11 The analysis relies on sector-level data at the two-digit industry of the NACE Rev. 2 sector classification.

12 In almost all studies covering developed countries the shift effect is much weaker than the intra-sector effect and its size decreases over time. In many cases the shift effect is negative or mixed (see, for example, *European Economy*, European Commission, 2003, and *OECD Compendium of Productivity Indicators 2018*, OECD Publishing, Paris, 2018.

13 Studies covering developing countries find a larger contribution of inter-sector reallocation to productivity growth as a result of the loss of weight of agriculture in favour of manufacturing. However, even in this set of countries, inter-sector reallocation is less important than intra-sector dynamics. For example, a very recent report of the World Bank finds that inter-sector reallocation has historically accounted for two-fifths of overall productivity growth in emerging economies (see Dieppe, A. (ed.), *Global Productivity: Trends, Drivers, and Policies*, World Bank Group, Washington, 2020). Regarding the euro area, the impact of the change in the weight in employment in the agricultural sector on productivity over the period 1960-1979 is estimated to be an annual 0.4% in Germany and 0.5% in France on average. The slowdown in sectoral reallocation after the shift from agriculture was completed is also estimated to have contributed to the overall productivity slowdown of these countries since the 1980s. See Card, D. and Freeman, R., "What Have Two Decades of British Economic Reform Delivered in Terms of Productivity Growth?" *International Productivity Monitor*, Vol. 5, 2002, pp. 41–52.

3 Microeconomic drivers of sector productivity growth

The previous section showed that the dynamics of euro area aggregate productivity are driven by intra-sector developments. This section explores the microeconomic drivers of sector productivity growth.

Sector productivity growth depends on within-firm productivity growth and on the evolution of the market share of each firm. In organising the analysis of productivity growth drivers, it is useful to think of sector productivity as the weighted average productivity of all firms in the sector. Sector productivity could therefore be written as the sum of two components: the unweighted average of firm productivity, that is, average productivity without taking into account the market share of each firm; and the allocation of economic weight – measured in terms of employment or value added share – across firms with differing productivity levels. In this framework, sector productivity will be higher if firms become more efficient – that is, their TFP increases – by investing in productivity-enhancing activities; this increases the unweighted average productivity of firms and is referred to as "within-firm productivity growth". Note that if investment in knowledge is complemented by investment in fixed capital – construction of new innovation facilities, for example – the capital intensity of the firm would also increase. Sector productivity will also be higher if resources are reallocated to relatively more productive firms; this increases their market share and is referred to as "dynamic allocation efficiency". Note that resources are reallocated across firms as a result of the contraction and expansion in the size of incumbent firms (between-firm resource reallocation), but also as a result of firm entry and exit (firm demography).

The remainder of this section will discuss the euro area drivers and trends related to within-firm productivity growth, between-firm resource reallocation and firm demography.

Within-firm productivity growth

Within-firm productivity growth depends on the quality of production inputs and on investment in productivity-enhancing activities. Managerial ability, which has been found to be a critical factor behind cross-country and cross-firm productivity differences[14], could be considered a production input, alongside labour and capital. Therefore, increasing managerial ability, investing in workers' training and substituting obsolete capital for new vintages would result in greater firm efficiency, i.e. TFP growth. Firm efficiency would also benefit from higher investment in R&D and innovation (e.g. technology creation) and from investment in existing technologies (technology adoption). Firms' decisions on these different drivers can be affected by structural and fiscal policies shaping market regulation and framework conditions that set incentives for innovative investment. Among all these drivers, the role of technology – creation and adoption – features particularly prominently in the literature, for two main reasons. First, some authors find that the greater ability of the

[14] See Bloom, N., Sadun, R. and Van Reenen, J., "Americans Do IT Better: US Multinationals and the Productivity Miracle", *The American Economic Review*, Vol. 102, No 1, 2012, pp. 167-201.

United States to create technology, and also to use it in the production process, is one of the main drivers of the US-Europe productivity gap.[15] Second, despite the apparent rapid recent advance of new technologies, labour productivity growth in most developed economies has been slowing down since before the GFC, as shown in Section 1.

The broad deceleration in productivity at a time of intense technology acceleration has been widely described as a puzzle or even as a paradox. There is extensive research and ongoing debate on what lies behind this paradox. The "techno-pessimists" argue that new technological innovations are simply less revolutionary than in the past, notably compared with those induced by the second industrial revolution.[16] In contrast, "techno-optimists" are of the view that the potential of information and communication technologies (ICT) and other new technologies will unfold in the coming decades, with a profound impact on productivity growth. This strand of literature argues that we might not yet have seen the full benefits of new technologies because they are still in development and because it takes time for new technologies to diffuse, for companies and workers to adapt, and for complementary investments to take place.[17] There is also a strand of thought arguing that the increasing prevalence of new technologies might have resulted in mismeasurement rather than in a productivity paradox.[18]

The speed of technology creation and adoption in the euro area can be approximated by analysing separately the TFP dynamics of frontier firms and laggards.[19] Frontier firms are the most productive firms in a narrowly defined sector across all analysed countries.[20] They are the ones expected to innovate and bring new technologies to the market. For this reason their TFP growth will be highly correlated with innovation and technology creation in the euro area. Laggards, in turn, are here defined as the median or representative firm in the sector. Their productivity growth hinges on the adoption of the technologies introduced by frontier firms in their sector of activity. Technology adoption (or speed of technology diffusion) can therefore be proxied by the TFP growth gap between frontier firms and laggard firms. It is understood that if new technology diffuses fast from frontier firms to the rest, the TFP growth developments of frontier and laggard firms should be similar, although starting at very different levels.

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15 See Van Ark, B., O'Mahoney, M. and Timmer, M., "The Productivity Gap between Europe and the United States: Trends and Causes", *Journal of Economic Perspectives*, Vol. 22, No 1, 2008, pp. 25-44.

16 See, for example, Gordon, R., "Secular Stagnation: A Supply-Side View", *American Economic Association Papers & Proceedings*, Vol. 105, No 5, 2015, pp. 54-59.

17 See, for example, Brynjolfsson, E. and McAfee, A., "The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies", WW Norton & Company, 2014.

18 See, for example, Syverson, C., "Challenges to mismeasurement explanations for the US productivity slowdown", *Journal of Economic Perspectives*, Vol. 31, No 2, 2017, pp. 165-186.

19 See Andrews, D., Criscuolo, C. and Gal, P.N., "Frontier Firms, Technology Diffusion and Public Policy", *OECD Productivity Working Papers*, No 2, OECD Publishing, 2015.

20 Ideally we should consider a global frontier, given that technology has no boundaries. However, due to data restrictions this sections analyses frontier firms in six large euro area countries.

Data on six euro area countries[21] show that technology creation slowed down in manufacturing over the period 2005-2017.[22] The analysis shows that TFP growth of frontier manufacturing firms in the pooled sample decreased from an annual average rate of 4.8% in the 2005-2007 period to 2.6% in the 2013-2017 period (Chart 4 – top panel). When manufacturing sectors are split according to their technology intensity, it becomes clear that the slowdown took place entirely in high-technology manufacturing sectors (Chart 5 – left panel). The ultimate reasons for the slowdown in technology creation in manufacturing are not yet clear. One possible explanation could be the high (and increasing over time) average age of manufacturing frontier firms, particularly in high-technology sectors (Chart 4 – bottom panel). A higher average age of firms within an industry can be a sign of an advanced technology lifecycle and/or of reduced firm dynamics (i.e. reduced entry and exit rates), which are often associated with a lower level of innovation activity.[23] Another possible reason could be related to the slowdown in trade integration, which may have contributed to the slowdown in technology creation of European manufacturing firms through decreased incentives to engage in technology upgrading and innovation and muted learning-by-exporting.

In contrast, the technology creation of frontier firms has accelerated in the services sectors. Over the post-GFC period, the TFP of frontier firms in services has grown at a higher annual rate than that of manufacturing frontier firms, showing an acceleration in innovation relative to previous periods (Chart 4 – top panel).[24] Chart 5 (right panel) shows that this transformation is taking place across traditionally low-tech service sectors such as retail and accommodation as much as across high-tech service sectors like financial or professional services. The acceleration in technology creation in services compensates for the observed slowdown in manufacturing, so the aggregate picture of euro area technology creation remains relatively stable over time. However, given that manufacturing industries have so far been a key driver of aggregate productivity growth in the euro area, the observed slowdown in manufacturing innovation might have consequences for the productivity outlook going forward.

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21 The countries covered are Belgium, Germany, Spain, France, Italy and Portugal, over the period 2005-2017. Data are sourced from ORBIS (BvD) and iBACH (firm-level data underlying the Bank for the Accounts of Companies Harmonized), refer to corporations with employees operating in the non-agricultural business sector, excluding the financial sector, and are treated with inverse population weights to improve sample representativeness.

22 Note that the distinction between manufacturing and services is becoming blurrier over time. The reason is that manufacturing firms increasingly provide services related to their products. To mitigate that problem, the analysis in this article uses unconsolidated accounts and classifies firms by their main activity.

23 See for example Huergo, E. and Jaumandreu, J., "How does probability of innovation change with firm age?", *Small Business Economics*, Vol. 22, No 3-4, 2004, pp. 193-207.

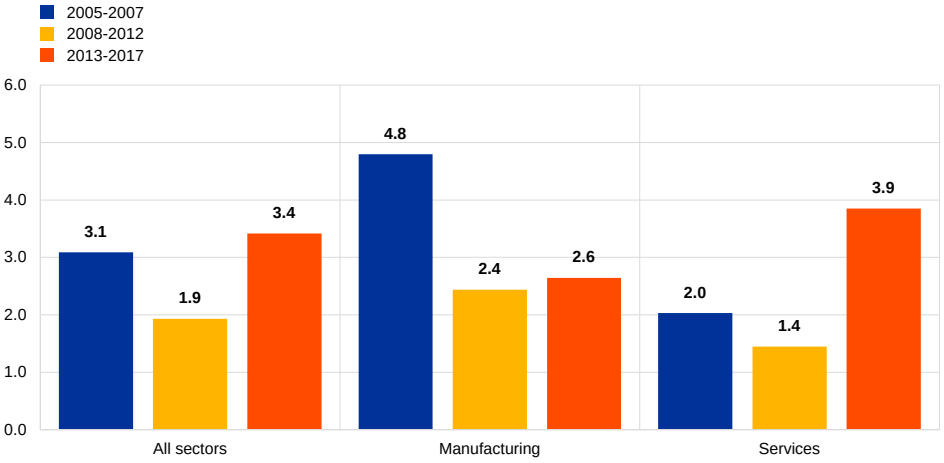
24 This increase reflects partly the changing nature of services sectors. Take the example of retail sales, which are increasingly online and use sophisticated algorithms to detect costumer's preferences and needs in real time.

Chart 4

Technology creation in the euro area

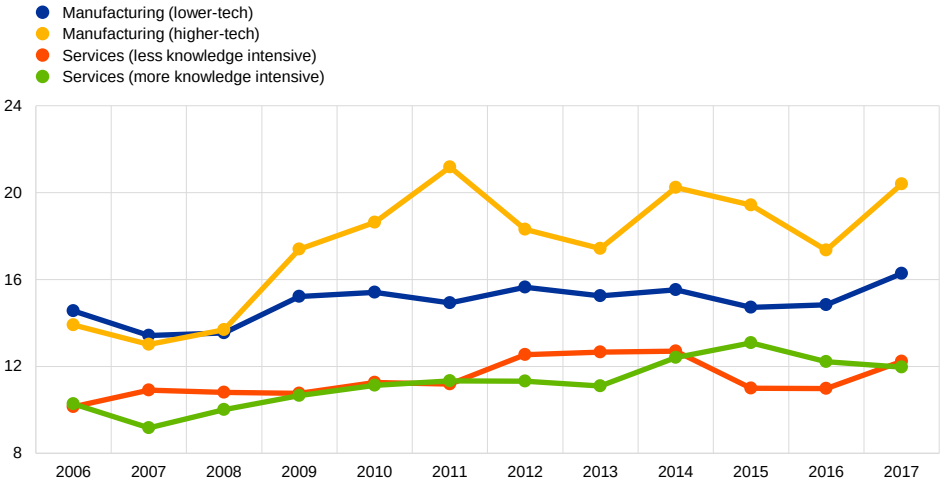
a) TFP growth of frontier firms (5% most productive firms), average across countries

(average TFP growth, annual percentage change)



b) Age of frontier firms by sector and technology-intensity/knowledge-intensity, average across countries, 2006-2017

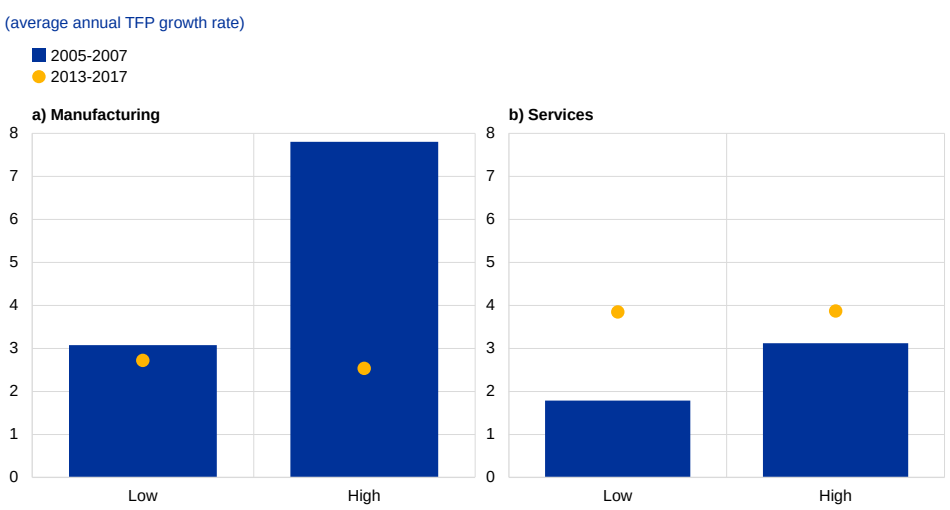
(years of activity)



Sources: ECB iBACH-Orbis database and own calculations.
Notes: The top chart shows average annual TFP growth rates of the 5% most productive firms in the pooled sample of countries in a given year within a NACE four-digit industry. Industry value added weights are used to aggregate up to the corresponding broad sector. In the bottom chart manufacturing industries are classified according to their R&D intensity (R&D by value added of the industry) into higher-tech (high-technology and medium high-technology) on the one hand, and lower-tech (medium low-technology and low-technology) on the other hand, following the Eurostat classification. Service industries are classified into knowledge-intensive services and less knowledge-intensive services based on the share of tertiary educated persons at NACE two-digit level, also following Eurostat standards.

Chart 5

TFP growth of frontier firms according to sector and technology-intensity/knowledge-intensity in the pre- and post-GFC periods, average across countries



Sources: ECB iBACH-Orbis database and own calculations.
Notes: The chart shows average annual TFP growth rates of the 5% most productive firms in the pooled sample of countries in a given year within a NACE four-digit industry. Industry value added weights are used to aggregate up to the corresponding broad sector. Manufacturing industries are classified according to their R&D intensity (R&D by value added of the industry) into high-technology and medium high-technology on the one hand, and medium low-technology and low-technology on the other hand following the Eurostat classification. Service industries are classified into knowledge-intensive services and less knowledge-intensive services based on the share of tertiary educated persons at NACE two-digit level, also following Eurostat standards.

The TFP growth gap between frontier firms and laggards in services is widening over time, reflecting a slowdown in technology diffusion (Chart 6 – right panel).[25] The reasons for the slowdown are manifold. It might be that tacit knowledge and the number of complex technologies have increased, thereby creating barriers to the catching-up of laggard firms. Also, the use of both new technologies and intangible capital is often characterised by high fixed costs and by network effects, possibly implying non-replicable increasing returns to scale.[26] This can also lead to "superstar" and "winner-takes-all" effects which might discourage laggard firms from investing in technology creation and adoption.[27] Finally, even if incentives to innovate and adopt technologies exist, necessary complementary inputs might be missing in laggard firms. One of the most important complementary investments is human capital, both of workers and of managers. It has been shown that employees need complementary information technology skills to exploit the full potential of new technologies; firms might also need to reorganise to adopt and benefit from new technologies. Other potentially lacking input factors are investment in necessary infrastructure (e.g. broadband) or complementary intangible inputs (e.g.

25 This is a widely documented fact across a variety of countries. See, for example, Andrews, D., Criscuolo, C. and Gal, P.N., "Frontier Firms, Technology Diffusion and Public Policy", *OECD Productivity Working Papers*, No 2, OECD Publishing, 2015, for OECD evidence.

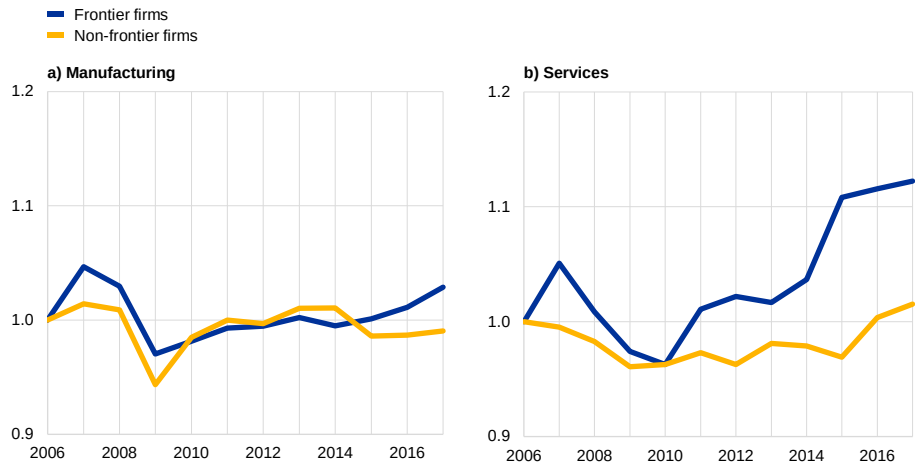
26 Network effects refer to a situation where a good or service becomes more valuable when more people use it. See Calvino, F. and Criscuolo, C. "Business dynamics and digitalisation", *OECD Science, Technology and Industry Policy Papers*, No 62, OECD Publishing, Paris, 2019.

27 "Winner-takes all" refers to market dynamics whereby globalisation and technological changes push sales towards the most productive firms in each industry, which results in product market concentration and the rise of very large dominant firms, also called "superstar" firms. See Autor, D., Dorn, D., Katz, L., Patterson, C. and Van Reenen, J., "The Fall of the Labor Share and the Rise of Superstar Firms", *The Quarterly Journal of Economics*, Vol. 135, Issue 2, May 2020, pp. 645-709.

organisational capital), while more advanced digital tools and applications have diffused to very few firms in most advanced countries.[28]

Chart 6

TFP growth gap between frontier and laggard firms as a proxy for technology diffusion in the euro area



Sources: ECB iBACH-Orbis database and own calculations.

Resource reallocation: between-firm resource reallocation and firm demography

At any moment in time, in every sector and country, there is significant reallocation of capital and labour across firms. Seminal work using US longitudinal firm-level data in the 1990s showed that about one in ten jobs were created and one in ten destroyed every year within narrowly defined sectors.[29] This high pace of job reallocation – measured as the sum of gross job creation and destruction – is a common feature across countries, sectors and years and is closely linked to worker reallocation given that most annual job creation and destruction reflects persistent firm-level employment changes.

If resources flow from low-productivity firms to firms with high productivity, reallocation will be productivity-enhancing even if average firm productivity does not change. If resources flowed instead to low-productivity firms, resources become misallocated. Several studies report increasing misallocation of resources since before the GFC.[30] This finding suggests that there might be structural factors,

28 For a literature overview, see Akcigit, U. and Ates, S.T., "What Happened to US Business Dynamism?", *NBER Working Paper*, No 25756, National Bureau of Economic Research, 2019; and "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No 268, ECB, September 2021.

29 Davis, S.J, and Haltiwanger, J., "Job Creation, Gross Job Destruction, and Employment Reallocation", *The Quarterly Journal of Economics,* Vol. 107, No 3, 1992, pp. 819-863.

30 See Gopinath, G., Kalemli-Özcan, S., Karabarbounis, L. and Villegas-Sanchez, C., "Capital allocation and productivity in South Europe", *The Quarterly Journal of Economics*, Vol. 132, No 4, 2017, pp. 1915-1967; and Gamberoni, E., Giordano, C. and Lopez-Garcia, P., "Capital and labour (mis)allocation in the euro area: some stylized facts and determinants", *Working Paper Series*, No 1981, ECB, November 2016.

besides cyclical ones, behind this trend. Distortions impairing the efficient allocation of production factors (capital and labour) across heterogeneous producers can stem from the design of taxes and tariffs, the regulation of input and output markets, financial frictions, or imperfect information.[31]

The impact of increased misallocation on TFP growth in the euro area could be substantial. Estimates from a meta-analysis of empirical papers quantifying TFP losses due to resource misallocation show that increasing resource misallocation could cost up to 0.2 percentage points of annual TFP growth in the euro area, which represents about half the average annual TFP growth over the period 2014-2019 (Chart 2).[32]

The process of creative destruction whereby new firms replace obsolete ones contributes to the reallocation of resources across firms, albeit to a small extent in the short term. The limited short-term contribution of firm demography is the result of two counterbalancing effects. Data on four euro area countries show that, on the one hand, the very low productivity of exiting firms relative to other firms in their market increases the productivity contribution of firm exit. On the other hand, new firms start up with relatively low productivity levels, which acts as a drag on productivity growth (Chart 7 – top panel).[33] The net contribution of entry and exit is, in consequence, positive overall but relatively small over the short term across all countries.

Post-entry selection of new firms increases the productivity contribution of young firms over the medium term. After entry, firms learn about their relative productivity and, if well below the average in the sector, exit after few years of operation. This is called the "selection effect".[34] In the sample analysed, about one-third of firms exit before completing three years of activity (Chart 7 – bottom panel).[35] Which firms survive the first years of operations depends on their productivity: young surviving firms are up to two and a half times more productive than young exiting firms in the same age bracket.[36]

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31 See "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No 268, ECB, September 2021 for a review of the literature.

32 This estimate comes from a meta-analysis based on 21 primary studies, with about 200 observations in total, for euro area countries. For further details on the meta-analysis, see "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No 268, ECB, September 2021.

33 The data used for the analysis of the post-entry development of firms are sourced from ORBIS and iBACH and cover four euro area countries: Belgium, France, Italy and Spain, over the period 2006-2018. For more details on the data, please refer to See "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No 268, ECB, September 2021.

34 See, for example, Jovanovic, B., "Selection and the Evolution of Industry", *Econometrica*, Vol. 50, No 3, 1982, pp. 649-670.

35 The results show selection of firms before completing three years of activity taking into account two cohorts of firms: those entering in 2006-2008 and those entering in 2013-20,14.

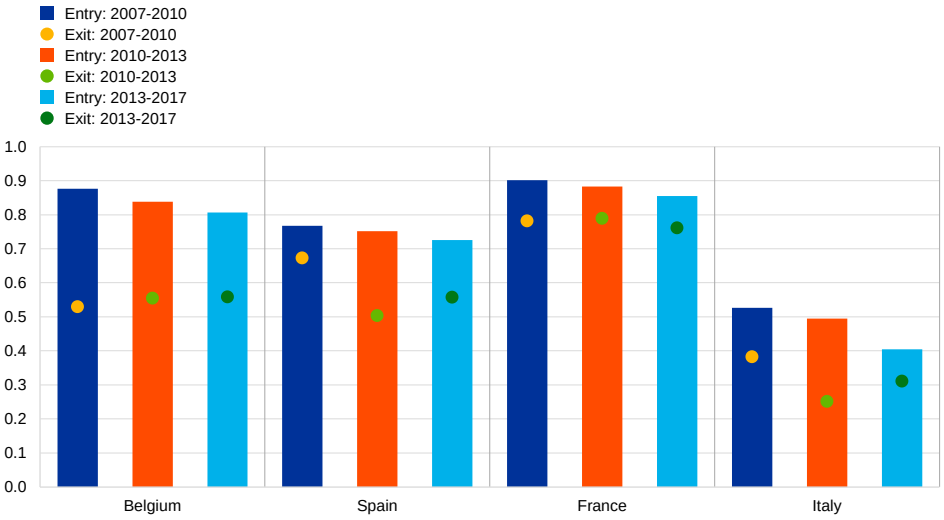
36 See "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No 268, ECB, September 2021.

Chart 7

Productivity at entry and exit, and selection effect

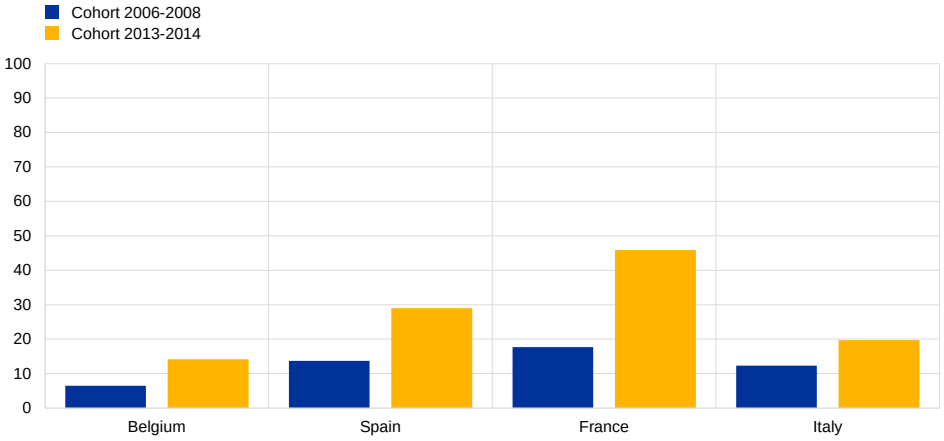
a) Productivity of new and exiting firms relative to incumbent firms, different periods

(index, 1=productivity of incumbent firms in the same country, sector and year)



b) Share of new firms exiting the market before completing three years of activity

(percentage share of new firms in each cohort)



Source: Own calculations based on ECB iBACH-Orbis data.

If they survive, new firms converge to the average scale of efficiency in the sector. This implies that these firms grow faster in terms of productivity than incumbents in the same sector, particularly during their first five years of activity. This is known as the "learning effect". After controlling for the country and sector of activity, sector demand conditions and entry year, it is found that young surviving firms in Belgium and France converge in about ten years to the productivity level of mature incumbent firms with more than 20 years of activity in the same sector. In Italy and Spain, where new firms' productivity level is well below that of incumbents, the catch-up process takes longer (Chart 8 – top panel).

The strong productivity performance of young surviving firms is driven by a few high-growth firms. Focusing on young firms entering after the GFC to negate the possible negative impact of the crisis, it is found that the distribution of average

annual productivity growth during their first six years of activity is extremely skewed (Chart 8 – bottom panel). Annual productivity growth of firms in the top 10% of the growth distribution is more than 80% on average, compared with the annual productivity growth of the median firm of up to 5%. Indeed, young firms have been shown to introduce radical innovations more frequently than mature firms,[37] although according to the findings of this analysis, few succeed. Moreover, recent analysis for the United States has found that firm entry and the prevalence of high-growth firms has declined over time.[38] Although the dataset used in this section does not cover a long enough period to analyse these facts in the European context, there is some evidence that business dynamism is also declining in Europe.[39]

37 See Acemoglu, D., Akcigit, U., Alp, H., Bloom, N. and Kerr, W.R., "Innovation, Reallocation and Growth", *American Economic Review*, Vol. 108, No 11, 2018, pp. 3450-3491.

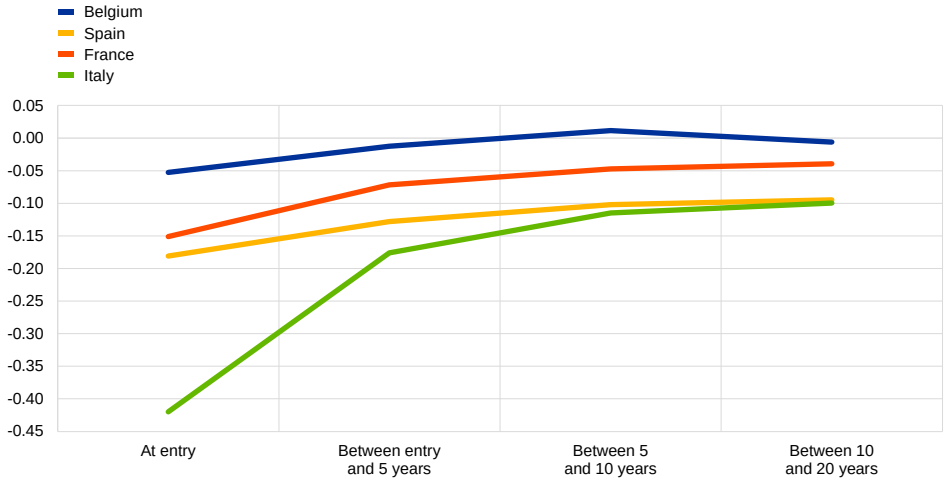
38 Decker, R., Haltiwanger, J., Jarmin, R. and Miranda, J., "Declining Business Dynamism: What We Know and the Way Forward", *American Economic Association Papers & Proceedings*, Vol. 106, No 5, 2016, pp. 203-207.

39 Calvino, F., Criscuolo, C. and Menon, C., "Cross-country evidence on start-up dynamics", *OECD Science, Technology and Industry Working Papers*, No 6, OECD Publishing, Paris, 2015.

Chart 8
Learning effects

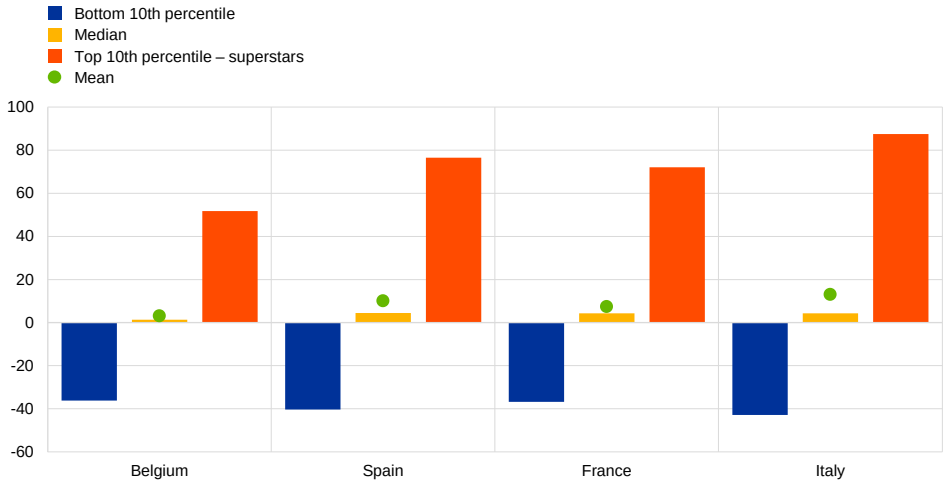
a) Productivity convergence of new firms to incumbents in the same sector, conditional on survival

(percentage deviation from productivity of reference category – firms with 20 or more years of activity)



b) Average annual productivity growth during the first six years of activity of firms born in 2012-13

(average annual productivity growth)



Source: Own calculations based on ECB iBACH-Orbis data.
Notes: The top panel shows the coefficient of each age bracket in a regression of labour productivity on age conditional on the survival of the firm and controlling for sector of activity, sector demand conditions and entry year of the firm. The bottom panel shows the distribution of annual productivity growth of firms during their first six years of activity.

New firms also contribute to aggregate productivity growth by increasing market competition. New innovative firms can stimulate innovative efforts of incumbents through the pressure of competition, leading to a positive impact on their within-firm productivity growth.[40]

[40] Anderton, R., Di Lupidio, B. and Jarmulska, B., "The impact of product market regulation on productivity through firm churning: Evidence from European countries", *Economic Modelling*, Vol. 91, September 2020, pp. 487-501.

The productivity implications of financially distressed firms

The delayed exit of financially distressed firms with low productivity could be a drag on productivity growth. As shown in Chart 7 (top panel), exiting firms tend to be significantly less productive than incumbents operating in the same sector. Hence, if these firms become financially distressed and do not exit the market, they could have an important negative impact on aggregate productivity growth. This impact can be either direct, given their relative low productivity, or indirect, because of possible crowding out of resources from healthy firms (congestion effects). Delayed exit may reflect stagnant productivity growth of incumbent firms, misallocation of resources or disrupted entry and exit of firms.

The literature has categorised firms as financially distressed according to different criteria. In their seminal papers focusing on firm-bank relationships in Japan in the 1990s, Hoshi[41] and Caballero et al.[42] identify "zombies" as firms with extremely low interest payments and high levels of debt that are likely to receive financial aid from lenders. In a second approach, recent studies, including this article, use various measures of sustained weak financial performance to identify financially distressed firms. These measures flag firms with persistently low profits – at least for three consecutive years – relative to interest paid and financial charges.[43]

The dynamics of firms in distress – those with an interest coverage ratio below one for three consecutive years – is highly procyclical. Using recent firm-level data from five euro area countries (Belgium, Italy, Netherlands, Portugal and Finland)[44], it can be shown that the share of financially distressed firms increased from 2006 to 2014 and declined thereafter (up to 2017, the year of the latest available data) across all analysed countries (Chart 9 – top panel). To identify the driver of this decline, the stock of financially distressed firms at any given moment is decomposed into inflows into distress, that is, firms entering financially distressed status, and outflows from distress, or firms exiting financially distressed status, either because they recover or because they exit the market. The exercise reveals that the cyclical dynamics of financially distressed firms are driven entirely by the entry of firms into distress, which declined sharply with the post-crisis economic recovery. On the other hand, outflows from distress have remained relatively unchanged over time (Chart 9 – bottom panel). This means that the average duration of firms' financially distressed status has been stable over time.

41 Hoshi, T., "Economics of the Living Dead", *Japanese Economic Review*, Vol. 57, Issue 1, pp. 30-49, March 2006.

42 Caballero, R.J., Hoshi, T. and Kashyap, A.K., "Zombie Lending and Depressed Restructuring in Japan", *American Economic Review*, Vol. 98, No 5, pp. 1943-1977, December 2008.

43 See Adalet McGowan, M., Andrews, D. and Millot, V., "The Walking Dead?: Zombie Firms and Productivity Performance in OECD Countries", *Economic Policy*, Vol. 33, No 96, 2018, pp. 685-736. For a discussion of the pros and cons of the different zombie definitions, see "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No 268, ECB, September 2021.

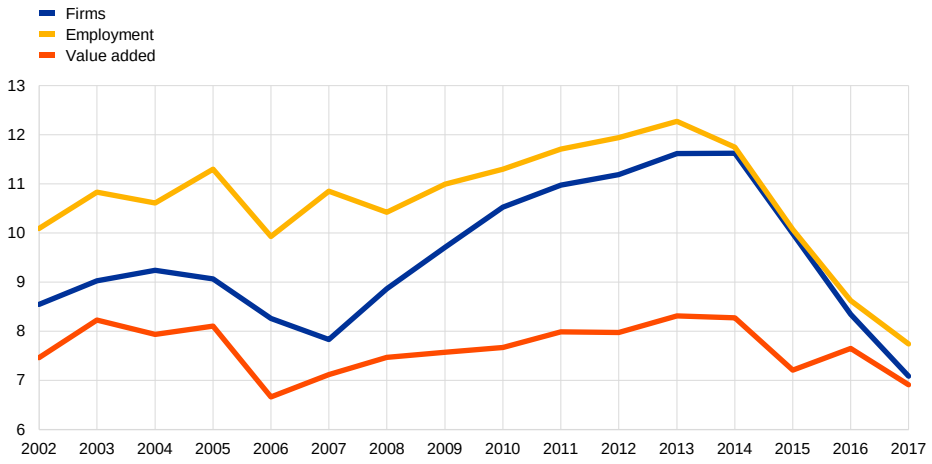
44 Further details regarding the data and methodology can be found in See "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No 268, ECB, September 2021.

Chart 9

The evolution of financially distressed firms

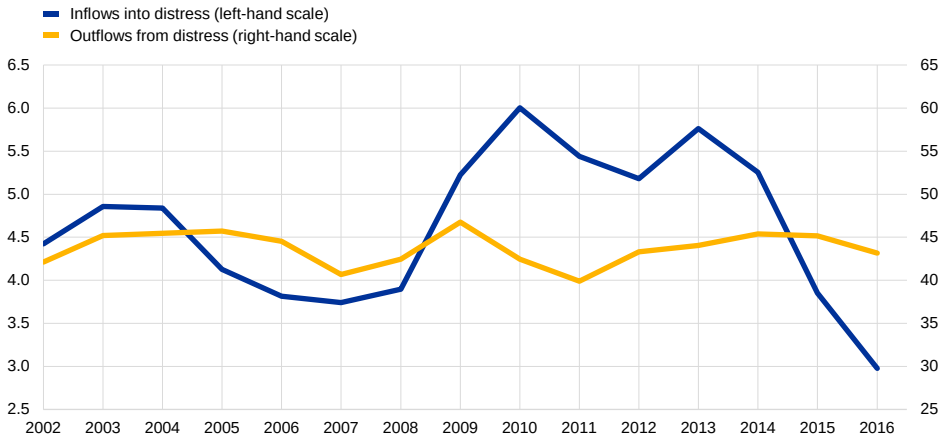
a) Share of financially distressed firms over time, weighted average across countries

(percentage of firms, employment and value added)



b) Inflows into and outflows from distress, weighted average across countries

(left-hand scale: percentage of healthy firms; right-hand scale: percentage of zombies)



Sources: Central Balance Sheet Database, Cerved Centrale dei Bilanci, Istituto Nazionale Previdenza Sociale, National Bank of Belgium Central Balance Sheet Office, Statistics Finland, Statistics Netherlands and authors' calculations.
Notes: Charts show the weighted average of developments in five euro area countries: BE, IT, NL, PT and FI. Financially distressed firms are defined as firms with a ratio of earnings before interest and taxes (ebit) and interest paid+financial charges of less than one (ebit/(interest+financial charges)<1) for three consecutive years. Manufacturing includes NACE Rev. 2 sectors 10-33 and private services includes sectors 45-63 and 69-82.

Not all firms in financial distress are alike. On average across years and countries, it is found that about half of firms in distress exit this status after three years: between 40% and 70% of firms exiting financially distressed status recover financial health and between 60% and 30% of them exit the market (Chart 10 – top panel). The other half of financially distressed firms, amounting to about 5% of total firms, stay in financially distressed status and therefore could be labelled as "zombies" (Chart 10 – bottom panel). This heterogeneity within financially distressed firms also becomes evident when looking at their labour productivity relative to healthy firms in the same country and sector. Whereas financially distressed firms as defined by the interest coverage ratio criterion are, on average, 60% as productive as healthy firms in the same country and sector, financially distressed firms that

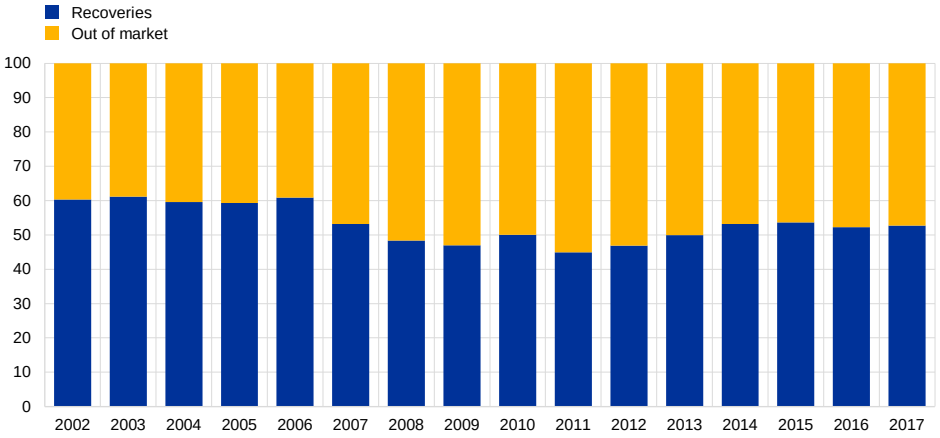
finally exit the market are significantly less productive than firms that recover financial health after a period in distress (Chart 10 – bottom panel).

Chart 10

Different types of financially distressed firms

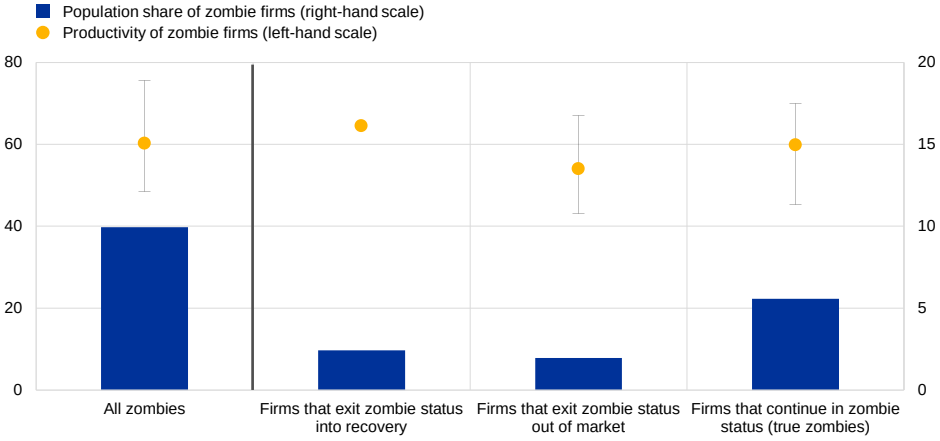
a) Exits from financially distressed status: recoveries or out of market

(percentage share of exits from financially distressed status)



b) Relative productivity and population share of different types of financially distressed firms, average across countries and years

(left-hand scale: index, 100=productivity of healthy firms in the same country and sector; right-hand scale: percentage share of population of active firms)



Sources: Central Balance Sheet Database, Cerved Centrale dei Bilanci, Istituto Nazionale Previdenza Sociale, National Bank of Belgium Central Balance Sheet Office, Statistics Finland, Statistics Netherlands and authors' calculations.
Notes: Financially distressed firms are defined as firms with a ratio of earnings before interest and taxes (ebit) and interest paid+financial charges of less than one (ebit/(interest+financial charges)<1) for three consecutive years. Manufacturing includes NACE Rev. 2 sectors 10-33 and private services includes sectors 45-63 and 69-82.

The literature has pointed to different factors behind the emergence of the zombie phenomenon, i.e. financially distressed and non-viable firms.[45] They primarily relate to institutional and structural factors such as the efficiency of insolvency frameworks, banking sector health and, as discussed in greater detail in the next section, also possibly a prolonged period of accommodative monetary policy. Empirical evidence suggests that inefficient insolvency regimes have been preventing non-viable firms from exiting the market. These firms' ability to exit is

45 Schivardi, F., Sette, E. and Tabellini, G., "Credit misallocation during the financial crisis", *BIS Working Papers*, No 669, 2017.

particularly important after an adverse aggregate shock to enable fast restructuring and to free up resources for other, more productive uses.[46] A weak banking sector also seems to be associated with the prevalence of zombie firms. The reason is that under-capitalised banks are less likely to foreclose zombie firms compared with stronger banks, which hinders the reallocation process. A typical mechanism is that weak banks seek to postpone registering losses in their accounts in an attempt to avoid recapitalisation and gamble on recovery. Finally, as discussed in the next section, there have been studies showing that a prolonged period of accommodative monetary policy could reduce incentives for firms to repair their balance sheet and delay the exit of unproductive or unviable firms. Overall, these findings highlight the importance of policies that aim to facilitate the allocation of resources towards more innovative and productive firms.

4 How does monetary policy interrelate with productivity growth?

Cyclical polices, including monetary policy, may under certain circumstances support productivity growth by affecting demand and financial conditions and thus also capital deepening and TFP growth. This section first discusses the theoretical channels through which monetary policy can affect productivity. It then presents novel empirical evidence of the effects of monetary policy on productivity and credit allocation in the euro area. It is important to emphasise that this novel analysis does not address all channels jointly, in a general equilibrium context, and covers only countries for which data were available.

An accommodative monetary policy stance may stimulate demand and investment in productivity-improving technologies. Beyond supporting demand and investment, an accommodative monetary policy stance might result in favourable financing conditions, with an impact on corporate profitability and on the productivity threshold for market survival, which also stimulates firm entry and delays firm exit. In the presence of tight financing conditions, an accommodative monetary policy prevents the death of highly productive firms that become financially constrained and facilitates their investment, thereby favouring aggregate productivity growth. At the same time, an accommodative monetary policy may also create some negative productivity effects under certain circumstances. First, low interest rates stimulate risk-taking which can worsen resource allocation, especially in the absence of appropriate bank supervision or macroprudential policies. Second, while an accommodative monetary policy stance can facilitate the flow of resources from firms with low productivity to firms with high productivity, particularly if the latter has been financially constrained, the opposite can also occur. For example, if firms with low productivity are less financially constrained because of high collateral (e.g. in the construction sector), resources could also flow to this type of firm and away from highly productive firms with more financial frictions (low net worth, information asymmetries owing to age or intangible assets, etc.). Third, easier financing

[46] See Andrews, D. and Petroulakis, F., “Breaking the shackles: zombie firms, weak banks and depressed restructuring in Europe”, *OECD Working Papers*, No 1433, OECD Publishing, 2017.

conditions may reduce the incentives for firms and banks to carry out necessary restructuring and balance sheet repair, with adverse effects on resource allocation.[47] This implies the need for monetary policy to be complemented by appropriate micro-prudential and macroprudential policies to prevent such distortions to build up and result in boom-bust episodes.

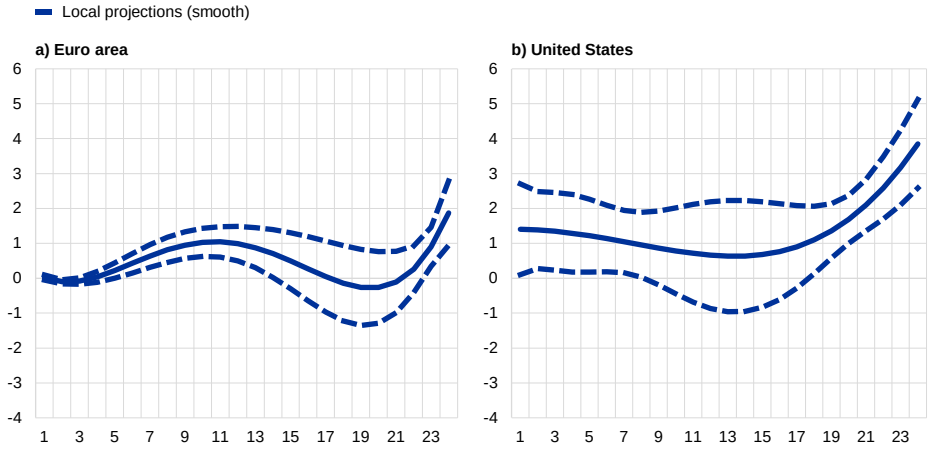
New empirical work suggests that accommodative monetary policy shocks have a positive impact on TFP growth in the long term.[48] In the short run there are only hints of anticipation of technology-enhancing investments for the euro area. In the longer term, however, TFP reacts positively to a monetary policy shock in both the United States and the euro area (Chart 11).

Chart 11

The impact of monetary accommodation on TFP over time

Dynamic response of cyclically adjusted TFP to a 100-basis point decrease in nominal interest rates

(x-axis in quarters; y-axis in cumulative percentage change relative to pre-shock TFP growth)



Sources: Euro area TFP computed using growth accounting at the industry level. Euro area cyclically-adjusted TFP stems from the European Commission Spring 2020 forecast while US cyclically adjusted TFP is taken from the database by Fernald.
Notes: The figures depict cumulative TFP growth at different time horizons (quarters, x-axis) after an expansionary monetary policy shock at t=0. Monetary policy shocks are identified using high-frequency surprises around monetary policy announcements as in Jarociński, M. and Karadi, P., "Deconstructing Monetary Policy Surprises – The Role of Information Shocks", *American Economic Journal: Macroeconomics*, Vol. 12, No 2, 2020, pp. 1-43l. Solid lines denote smooth local projections estimates; dashed lines denote 68% confidence intervals.

Empirical analysis shows little evidence of a deterioration in resource allocation at the time of accommodative monetary policy decisions. In a low interest rate environment, banks could relax lending standards (heightened risk-taking, credit booms) and might increasingly lend also to non-viable firms, which could put pressure on aggregate productivity given the relatively lower productivity of such firms, as shown in the previous section (Chart 10 – bottom panel). To explore this possible channel, three new pieces of analysis are conducted. The first exploits

47 See "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No 268, ECB, September 2021, for a review of the literature exploring the channels through which monetary policy affects productivity.

48 For more information on the exercise on US data, see also Hartwig, B. and Lieberknecht, P., "Monetary Policy, Firm Exit and Productivity", *Bundesbank Discussion Paper*, No 61, 2020.

the ECB survey on the access to finance of enterprises (SAFE)[49], to find out whether the accommodative monetary policy of recent years facilitated access to finance, and therefore survival, of weak firms in the euro area.[50] Results show that the easing of financing conditions following expansive monetary policy decisions facilitated access to finance for most firms, but significantly less for weak or vulnerable firms (Chart 12). The only exception was large firms with an interest coverage ratio temporarily below 1 (that is, with profits below interest payments), which actually gained access to finance when financing conditions were eased. This result could be driven by the fact that bank balance sheets are more sensitive to large firms in distress and large firms have more bargaining power.[51] The second piece of analysis focuses on the pricing behaviour of banks in France and uses credit registry data to analyse whether the share of low-solvency firms benefiting from exceptionally low interest rates[52] has increased during the low interest rate period. The results show that this share remained subdued and stable in France over the past decade, suggesting that credit misallocation is not pervasive in France. The third piece of analysis focuses on Spain, Italy and Portugal – countries with a relatively large share of financially constrained firms – and finds that capital allocation improved after a positive monetary policy shock. The reason is that the decrease in the interest rate increased investment relatively more in firms with high marginal revenue productivity of capital that were initially financially constrained (younger, more dependent on external finance and featuring low mark-ups).[53]

49 The analysis covers the period 2009-2020 and therefore monetary policy decisions taken by the ECB since the GFC. For more details on data and methodology, refer to "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No 268, ECB, September 2021; and *Survey on the access to finance of enterprises: Methodological information on the survey and user guide for the anonymised micro dataset*, ECB, Frankfurt am Main, 2020.

50 Weak firms are defined in different ways: i) according to a strict SAFE indicator of vulnerable firms, i.e. firms that have reported simultaneously lower turnover, decreasing profits, higher interest expenses and higher or unchanged debt to total assets in the last six months; ii) according to the interest coverage ratio, i.e. they are firms with interest expenses/operating profits below one for three consecutive years, as discussed in the previous section; iii) according to the Altman Z-score; and iv) according to the relative productivity of the firm, where productivity is defined as real value added or turnover per employee.

51 For further results, see Acharya, V., Eisert, T., Eufinger, C. and Hirsch, C., "Whatever It Takes: The Real Effects of Unconventional Monetary Policy", *The Review of Financial Studies*, Vol. 32 ,No 9, 2019, pp. 3366-3411; and "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No 268, ECB, September 2021.

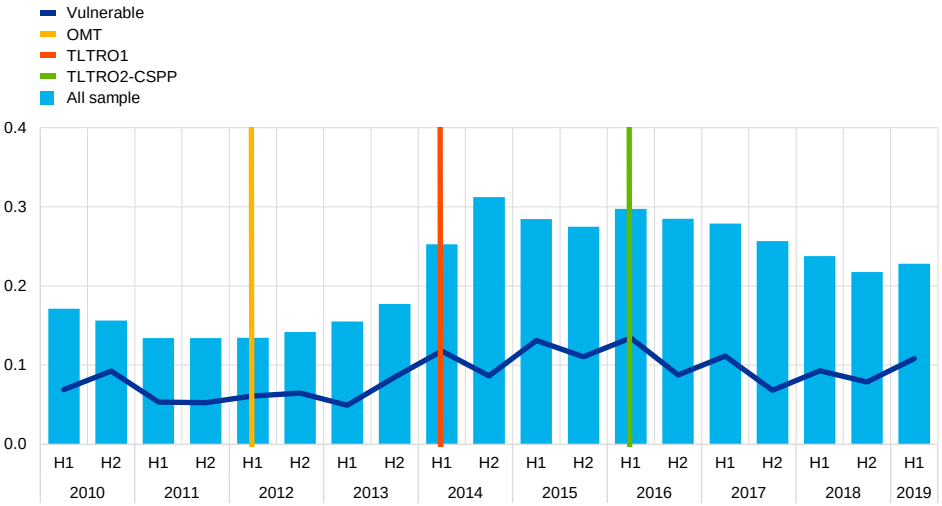
52 That is, credit misallocation is identified as the incidence of low-solvency firms receiving an interest rate on their new loans below a "prime" rate reserved only for the highest quality firms. See Caballero, R.J., Hoshi, T. and Kashyap, A.K., "Zombie lending and depressed restructuring in Japan", *The American Economic Review*, Vol. 98, No 5, 2008, pp. 1943-1977; and "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No 268, ECB, September 2021.

53 For more details on data and methodology, see "Key factors behind productivity trends in EU countries", *Occasional Paper Series*, No 268, ECB, September 2021; and Albrizio, S. and González, B., "Monetary policy and capital misallocation in Europe", forthcoming working paper, Banco de España, Madrid.

Chart 12

Improvements in access to bank finance by firm type after selected monetary policy decisions

(net share of firms responding that access to finance has improved over the preceding six months; weighted percentages of respondents)



Source: ECB/EC SAFE.
Notes: Enterprises that had applied for bank loans. Vulnerable firms are firms that have reported simultaneously lower turnover, decreasing profits, higher interest expenses and higher or unchanged debt to total assets in the last 6 months OMT: outright monetary transactions programme; TLTRO: targeted longer-term refinancing operations; CSPP: corporate sector purchase programme The first vertical line denotes the announcement of the OMT; the second vertical line denotes the start of TLTRO I and the negative rate policy; and the third vertical line denotes the start of TLTRO II and the CSPP. Figures refer to rounds 3 (March-September 2010) to 22 (October 2019-March 2020) of the survey.

5 Conclusion

Productivity growth in the euro area has been muted for decades, owing to a variety of interacting factors. First, capital deepening has been weak in the euro area since the GFC as a result of low investment and employment recovery. Second, within-firm productivity growth has slowed down since the pre-GFC period, reflecting slower technology creation in manufacturing firms with a negative impact on euro area TFP growth. Although this development has been partly compensated for by an acceleration of innovation in services, new technologies resulting in higher services TFP growth seem to benefit largely frontier firms; most firms in services, in contrast, are lagging behind in technical adoption, which is slowing their TFP growth. Third, the contribution of resource reallocation across incumbents to productivity growth has been declining since before the GFC. Fourth, firm demographics make only a small positive contribution to productivity growth, because new firms have below-average productivity and few surviving firms record high productivity growth. Delayed exit of low-productivity financially distressed firms has probably played a role, albeit a minor one, in dragging down productivity growth over past decades.

These factors hinge on firms' internal and external levers, suggesting a strong role for national policies in spurring productivity growth. There is ample evidence that euro area countries could achieve significantly stronger productivity growth by following global best practices in terms of structural policies and regulation

of various markets.[54] Those include policies that enhance labour mobility across and also within firms, sectors and regions; that support the diffusion of technology and the growth of more innovative and productive firms; that create a more competitive environment in product markets; that strengthen the contribution of finance to a more efficient allocation of savings and discourage the excessive accumulation of corporate debt; and that strengthen insolvency frameworks to facilitate the exit of less productive firms.

At the same time, the article finds tentative evidence of monetary policy having a positive effect on productivity growth, at least under a partial equilibrium approach. The preliminary new evidence presented in this article suggests that by supporting demand and investment of financially constrained firms with high marginal revenue productivity of capital, the accommodative monetary policy stance in the euro area may have improved capital allocation. It is also found that the accommodative stance has not, overall, adversely affected credit allocation, although there may be some exceptions relating to large firms with profits below interest payments.

Looking ahead, productivity developments will also depend on the interaction of key drivers of productivity growth with the effects of the COVID-19 pandemic. Despite recent encouraging signs, there remain some threats, owing to the possible restructuring of global value chains after the pandemic and a further rise in trade barriers. The massive policy support for the corporate sector in response to the pandemic crisis has been crucial in mitigating the initial impact of the shock. However, once the economic recovery takes hold on a sustainable basis, policy support needs to be lifted gradually, also to avoid impairing the efficient reallocation of resources by setting wrong incentives. In addition, such withdrawal should avoid an undue tightening of financial conditions that would increase the financing cost and reduce the expected benefits of new productivity-enhancing projects and delay investment, with impacts on productivity growth.

On the upside, accelerated digital uptake as a result of the COVID-19 shock might yield to higher productivity growth going forward. Available evidence on the productivity impact of the COVID-19 shock seems to support this possibility, as discussed in the accompanying Box 4 in this issue of the Economic Bulletin. However, the pace and distributional impacts of accelerated digital uptake are still uncertain and depend on the development of institutions, infrastructure, skills, methods of production and management competencies. Also, large investment in green technologies could significantly push the technological frontier outwards. However, in order to facilitate the structural change required to put green production practices in place, new investment should be complemented with favourable framework conditions.

54 For an overview of the impact of structural policies on productivity, see “Key factors behind productivity trends in EU countries”, *Occasional Paper Series*, No 268, ECB, September 2021, and Masuch, K., Anderton, R., Setzer, R. and Benalal, N., “Structural policies in the euro area”, *Occasional Paper Series*, No 210, ECB, 2018.

3 The euro area housing market during the COVID-19 pandemic

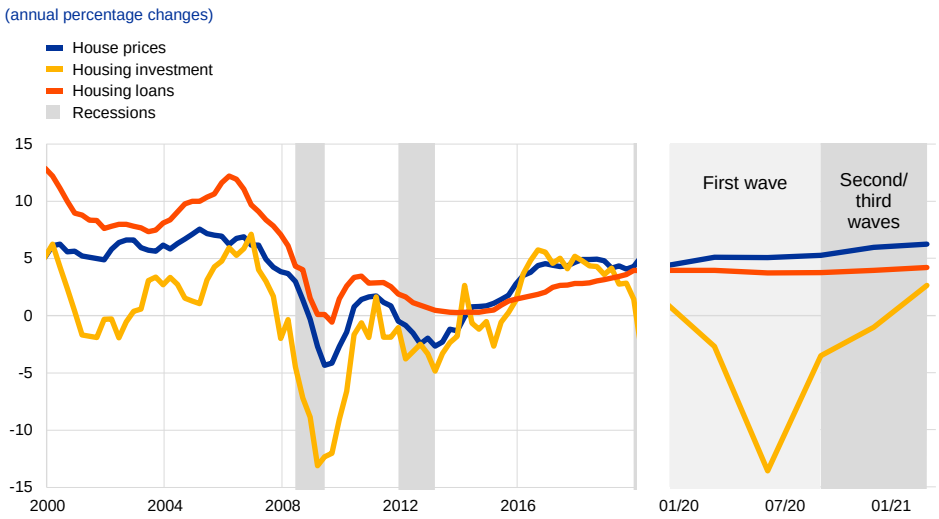
Prepared by Niccolò Battistini, Matteo Falagiarda, Johannes Gareis, Angelina Hackmann and Moreno Roma

1 Introduction

The euro area housing market was in a relatively long expansionary cycle before it entered the coronavirus (COVID-19) crisis.[1] On the eve of the COVID-19 crisis, the euro area housing market was on solid ground. In the last quarter of 2019, house prices, housing investment and housing loans were on an upward trend, supported by robust income developments and bank lending rates for house purchases at historical lows (Charts 1 and 2).[2] Given the phase in which the housing cycle stood, an economic shock like the COVID-19 crisis might have been expected to turn the cycle.

Chart 1

House prices, housing investment and housing loans in the euro area



Sources: Eurostat and ECB.
Note: Grey areas delimit recessions, as identified by the Centre for Economic Policy Research (CEPR) Euro Area Business Cycle Dating Committee.

However, the reaction of the euro area housing market to the COVID-19 crisis differed from that in previous crises owing to the different nature of the

1 For an assessment of the state of the euro area housing market before the COVID-19 pandemic, see the article entitled "The state of the housing market in the euro area", *Economic Bulletin*, Issue 7, ECB, 2018.

2 Throughout this article, unless otherwise indicated, house prices refer to the nominal house price index, housing investment to real investment in residential construction and housing loans to loans to households for house purchases in nominal terms.

underlying shock.[3] The global financial crisis of 2008 originated in the US housing market and the sovereign debt crisis that started in 2010 stemmed primarily from financial shocks. Initially, the shock caused by the COVID-19 pandemic was unrelated to economic fundamentals and – especially in its early phases – afflicted the economy mainly through mandatory and voluntary restrictions on mobility aimed at containing the spread of the virus. These restrictions induced peculiar features compared with the global financial crisis and the sovereign debt crisis, notably as a result of their diverse impact on real and nominal housing dynamics and differing housing developments across countries. The particular nature of the COVID-19 pandemic triggered vigorous monetary, fiscal and macroprudential policy responses.

This article explores the developments in the euro area housing market during the pandemic and compares them with those in previous crises, paying particular attention to the role of policy support measures. Throughout, the article takes a holistic approach that covers developments in and prospects for euro area housing investment, house prices and loans for house purchase. Section 2 focuses on the diverse impacts on the euro area housing market of the first wave of the COVID-19 pandemic from the first to the third quarter of 2020, when strict containment measures had the greatest effect on activity. Section 3 elaborates on the subsequent resilience of the housing sector through the second and the third waves of the pandemic up to the second quarter of 2021, amid more targeted containment measures and significant policy support measures. Section 4 provides a forward-looking perspective on the prospects and risks for the euro area housing market.

2 The first wave of the COVID-19 pandemic – the diverse impacts of containment measures on the euro area housing market

The containment measures in response to the first wave of the COVID-19 pandemic led to a divergence between real and nominal housing dynamics. The severe decline in mobility induced by containment measures and voluntary social distancing during the first wave of the pandemic had a negative impact on euro area housing investment, pushing it to 3.1% below its end-2019 level in the third quarter of 2020, broadly in line with the levels seen during the global financial crisis and the sovereign debt crisis (Chart 2). However, while in the previous crises deteriorating economic fundamentals hampered growth in house prices and housing loans, the COVID-19 shock did not weigh on the upward trajectory of prices and loans, which surpassed their levels in the fourth quarter of 2019 by 4.3% and 2.6%

[3] Throughout the article, in line with the chronology of euro area business cycles established by the CEPR Euro Area Business Cycle Dating Committee, unless otherwise stated, we refer to the COVID-19 crisis as the period between the fourth quarter of 2019 (pre-crisis peak) and the latest available quarter (since no end date has yet been set). The global financial crisis refers to the period between the first quarter of 2008 and the second quarter of 2009, while the sovereign debt crisis refers to the period between the third quarter of 2011 and the first quarter of 2013.

respectively in the third quarter of 2020, supported by resilient housing demand amid policy support measures (Box 1).[4]

Chart 2

Euro area housing market developments in the global financial crisis, sovereign debt crisis and the first wave of the COVID-19 crisis

(percentage changes; lending rate and indebtedness as percentages)

Sources: Eurostat, ECB and authors' calculations.
Notes: Lending rate refers to the composite lending rate on housing loans. Indebtedness refers to the ratio of housing loans to annual gross disposable income. All variables are computed as average percentage changes over the reference periods, except the lending rate and indebtedness, where the bars refer to their levels in the quarter before the reference periods and the diamonds refer to the level in the final quarter of the reference periods. The reference periods are defined in Section 1.

The different nature of the COVID-19 pandemic compared with previous crises is also visible in the larger degree of diversity in housing investment dynamics across countries. Losses in housing investment during the first three quarters of 2020 varied widely, with nine countries recording gains and two countries (Spain and Malta) incurring larger losses than during the global financial crisis (Chart 3). These heterogeneous dynamics can partly be explained by the timing and relative degree of restrictiveness of containment measures,[5] with construction activity being temporarily halted in some countries.[6] Other factors included the initial fiscal support measures, which varied considerably across countries in terms of scale and timing,[7] as well as the different demographic structures of the national housing markets.

4 For an analysis of developments in euro area house prices and their relation to macroeconomic conditions along different dimensions, see the box entitled "Euro area house price developments during the coronavirus pandemic", *Economic Bulletin*, Issue 4, ECB, 2021.

5 The stringency of containment measures, proxied by the Oxford stringency index, explains around 25% of the total cross-country variation in housing investment levels over the first three quarters of 2020. For the Oxford stringency index, see Hale, T., Angrist, N., Cameron-Blake, E., Hallas, L., Kira, B., Majumdar, S., Petherick, A., Phillips, T., Tatlow, H. and Webster, S., "Oxford COVID-19 Government Response Tracker," Blavatnik School of Government, 2020.

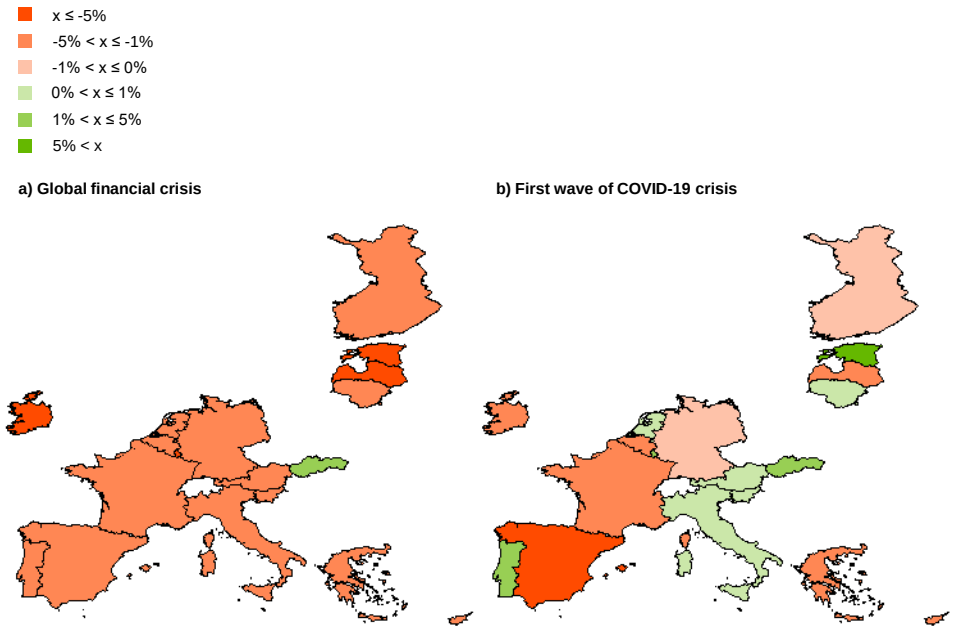
6 See the study entitled "Impacts of the COVID-19 pandemic on EU industries", European Parliament, March 2021; the box entitled "The impact of containment measures across sectors and countries during the COVID-19 pandemic", *Economic Bulletin*, Issue 2, ECB, 2021; the box entitled "The heterogeneous economic impact of the pandemic across euro area countries", *Economic Bulletin*, Issue 5, ECB, 2021, and the references therein.

7 See, for example, "The initial fiscal policy responses of euro area countries to the COVID-19 crisis", *Economic Bulletin*, Issue 1, ECB, 2021.

Chart 3

Housing investment across euro area countries during the global financial crisis and the first wave of the COVID-19 crisis

(average percentage changes)



Sources: Eurostat and authors' calculations.
Note: In the legend, variable "x" refers to the average percentage change in housing investment during the respective reference periods in each panel, as defined in Section 1.

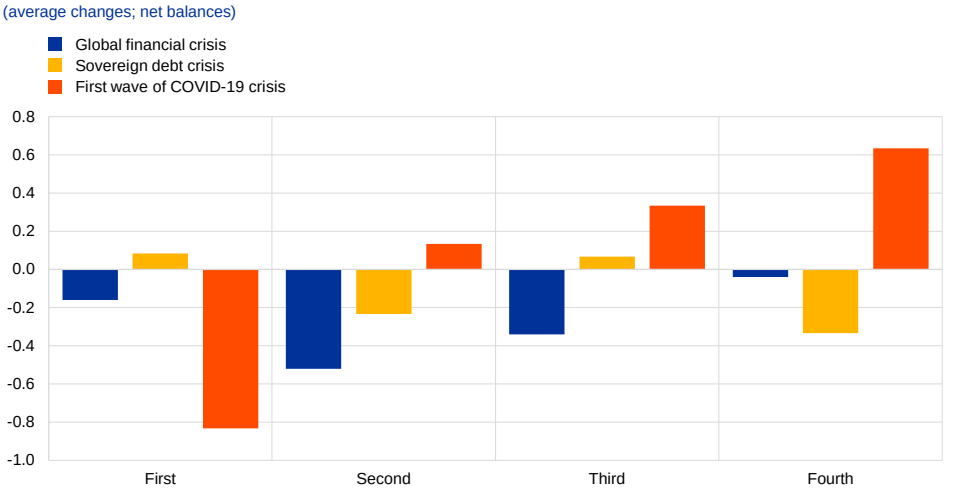
Demographic structures may also have induced diverse housing investment dynamics across countries, reflecting the differing impact of the first wave along the income distribution. Countries where a larger share of income is earned by poorer households experienced stronger declines in housing investment during the first wave of the pandemic.[8] Euro area survey data corroborates this, as lower-income households remained significantly less willing to purchase a house compared with pre-crisis levels by the end of the first wave of the pandemic in contrast to developments during the global financial crisis and the sovereign debt crisis (Chart 4). Instead, the intentions of medium and higher-income households to purchase property increased. This most likely resulted from these income groups' high levels of accumulated savings induced by restrictions on the consumption of high-contact services.[9]

8 This is obtained controlling for time- (quarterly-) fixed effects and the stringency of containment measures, as proxied by the Oxford stringency index based on the first three quarters of 2020 for euro area countries.

9 Indeed, the strong rebound of intentions to purchase property for medium and higher-income households (in contrast to lower-income households) in response to the easing of containment measures at the end of the first wave of the pandemic followed the large increase in savings in the early phases of the pandemic, in line with evidence from the Consumer Expectations Survey (CES). See the box entitled "COVID-19 and the increase in household savings: an update", *Economic Bulletin*, Issue 5, ECB, 2021. According to CES data, higher-income homeowners reported less pressing financial concerns and more buoyant house purchases in the third quarter of 2020. See Christelis, D., Georgarakos, D., Jappelli, T. and Kenny, G., "The COVID-19 crisis and consumption: survey evidence from six EU countries", *Working Paper Series*, No 2507, ECB, December 2020.

Chart 4

Households' intentions to purchase property across income quartiles in the global financial crisis, the sovereign debt crisis and the first wave of the COVID-19 crisis



Sources: European Commission and authors' calculations.
Note: The reference periods are defined in Section 1.

Box 1

The impact of restrictions on mobility on the housing market – a structural approach

Prepared by Niccolò Battistini and Johannes Gareis

This box examines empirically the impact of mandatory and voluntary restrictions on economic agents' mobility following the outbreak of the coronavirus (COVID-19) pandemic on housing investment and house prices, accounting for several transmission mechanisms that are relevant for the housing market. On the basis of euro area aggregate data between the first quarter of 2000 and the first quarter of 2021, a Bayesian vector autoregression (BVAR) model exploits information from the dynamic interactions among seven endogenous variables: housing investment; real house prices; the composite lending rate on loans for house purchases; the stock of loans for house purchases; real GDP; consumer prices (HICP); and the shadow rate.[10] Following a large body of empirical literature,[11] the model identifies the main drivers of the housing market, imposing zero and sign restrictions on the co-movements among the endogenous variables upon the impact of

[10] All the variables are quarter-on-quarter percentage changes, except for the lending and the shadow rates, which are quarter-on-quarter changes. The shadow rate is taken from Lemke, W. and Vladu, A. L., "Below the zero lower bound: a shadow-rate term structure model for the euro area", *Working Paper Series*, No 1991, ECB, January 2017.

[11] Among studies that include the euro area, see Smets, F. and Jarociński, M., "House prices and the stance of monetary policy", *Working Paper Series*, No 891, ECB, April 2008; Bijsterbosch, M. and Falagiarda, M., "Credit supply dynamics and economic activity in euro area countries: A time-varying parameter VAR analysis" , *Working Paper Series*, No 1714, ECB, August 2014; Gambetti, L. and Musso, A., "Loan Supply Shocks and the Business Cycle", *Journal of Applied Econometrics*, Vol. 32, Issue 4, 2017, pp. 764-782; Nocera, A. and Roma, M., "House prices and monetary policy in the euro area: evidence from structural VARs", *Working Paper Series*, No 2073, ECB, June 2017; and Altavilla, C., Darracq Pariès, M. and Nicoletti, G., "Loan supply, credit markets and the euro area financial crisis", *Journal of Banking & Finance*, Vol. 109, December 2019.

various fundamental shocks.[12] To account for the specific characteristics of the COVID-19 crisis, the model includes – as an exogenous variable – a measure of the effective stringency of containment measures, namely the effective lockdown index. Conceptually, this index aims to isolate the economic impact of restrictions on mobility – accounting for both containment measures and voluntary social distancing – during the different waves of the pandemic.[13] In practice, the index acts as an augmented dummy variable, limiting the estimation problems induced by the abrupt and large fluctuations in economic developments observed since the start of the COVID-19 crisis.[14]

The historical decomposition of the drivers of housing investment and house prices highlights the peculiar effects of the COVID-19 crisis on the housing market (Chart A). During the global financial crisis and the sovereign debt crisis, economy-wide shocks and housing market-related forces, such as housing demand and supply, as well as credit supply shocks, were behind the protracted decline in both housing investment and house prices. In contrast to the two preceding crises, economic fundamentals mostly supported both housing investment and house prices, on average, over the COVID-19 crisis. However, containment measures induced a dichotomy between real and nominal housing dynamics. In fact, effective restrictions on mobility significantly weighed on activity, while they left house prices relatively unaffected throughout the COVID-19 crisis. Over the COVID-19 crisis, the identified shocks can explain housing investment relatively well, but less so for house prices. The gap between actual and explained house prices is the result of unidentified factors, such as risk aversion and possible changes in preferences, and a positive average growth rate.

12 The housing demand and supply shocks are identified based on the contemporaneous reaction by housing investment and house prices, which are assumed to move in the same direction for housing demand shocks and in opposite directions for housing supply shocks. Housing demand and credit supply shocks differ, as they imply opposite reactions in the lending rate, while housing investment and house prices co-move positively in response to both shocks. Expansionary aggregate demand shocks induce an increase in real GDP, consumer prices and the shadow rate, while expansionary aggregate supply shocks lead to an increase in real GDP and a decline in consumer prices. A monetary policy loosening induces a decline in the lending and the shadow rates and puts upward pressure on housing investment, house prices, real GDP and consumer prices. Housing-related shocks are assumed to have no contemporaneous impact on aggregate variables, i.e. real GDP, consumer prices and the shadow rate. The model includes one unidentified shock to capture the effects of any further remaining disturbances. For technical details on the implementation, see Arias, J. E., Rubio-Ramírez, J.F. and Waggoner, D. F., "Inference Based on Structural Vector Autoregressions Identified With Sign and Zero Restrictions: Theory and Applications", *Econometrica*, Vol. 86, Issue 2, 2018, pp. 685-720.

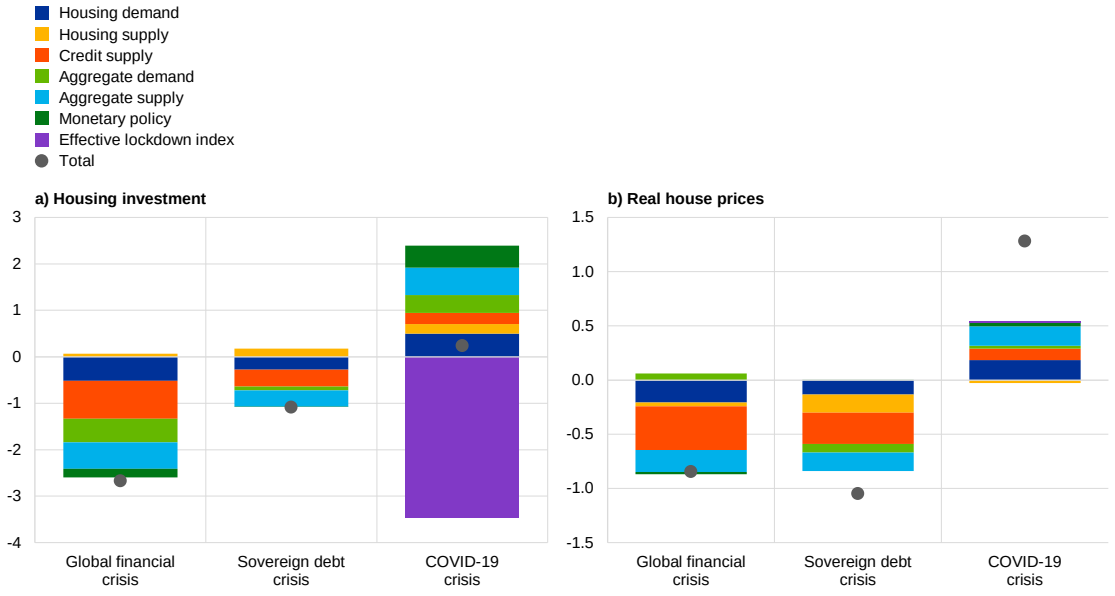
13 The effective lockdown index is constructed multiplying the Oxford stringency index (Hale et al., op. cit.) by the Google residential mobility index, which closely reflects the dynamics in footfall related to work-from-home arrangements, identified as being among the main drivers of the process of learning by economic agents, and explaining the cross-sectoral heterogeneity in the impact of containment measures over the different phases of the COVID-19 pandemic. See the box entitled "The impact of containment measures across sectors and countries during the COVID-19 pandemic", op. cit. Results are qualitatively robust to the use of alternative Google mobility measures.

14 See Lenza, M. and Primiceri, G., "How to estimate a VAR after March 2020", *Working Paper Series*, No 2461, ECB, August 2020.

Chart A

Drivers of housing investment and real house prices during the global financial crisis, the sovereign debt crisis and the COVID-19 crisis

(quarter-on-quarter percentage changes and percentage points)



Sources: Eurostat, Hale et al., op. cit., Lemke and Vladu, op. cit., Google residential mobility index, ECB, and authors' calculations.
Notes: For comparability, the figures are reported as average quarter-on-quarter percentage changes and contributions over the reference periods, as defined in Section 1. The contribution of the constant term and other unidentified residuals (related for instance to risk aversion and possible changes in preferences) is not shown.

3 The second and the third waves – housing market resilience amid policy support measures

The housing market proved resilient during the second and third waves of the COVID-19 pandemic. In spite of the deterioration in the epidemiological situation that led to a tightening of restrictions in the fourth quarter of 2020, the euro area housing market gained further momentum. House prices remained on an upward trend, increasing in annual terms by around 6% in both the fourth quarter of 2020 and the first quarter of 2021, a pace not seen since mid-2007. Housing investment recovered further in the same reference period, settling close to its pre-crisis levels. These signs of significant resilience stemmed from both the supply side, as indicated by the momentum in value added and employment in construction and real estate, and the demand side, as suggested by the return of the number of transactions to pre-crisis levels in many euro area countries and the increased demand for mortgage loans. The milder impact of restrictions compared with the first wave and the significant stepping-up of fiscal and monetary policy measures, continuous favourable financing conditions, the increased attractiveness of housing for investment purposes – in view of forced savings – helped to strengthen housing investment and exert upward pressure on house prices.[15]

[15] For more details, see "The impact of containment measures across sectors and countries during the COVID-19 pandemic", op. cit.

Fiscal policy measures were key in mitigating the negative effects of the second and the third waves of the pandemic on the housing market. These measures included short-time work schemes, targeted transfers to more vulnerable segments, cuts to personal income taxes, social contributions and indirect taxes. Policy interventions to support firms also contributed to mitigating the impact of the crisis on employment and income, and helped construction firms maintain housing supply.[16] These measures included direct support schemes for firms and the self-employed, partial compensation of losses, subsidies, tax deferrals and public guarantees on bank loans.[17] Other important policy tools were moratoria schemes, which provided households and firms with short-term relief through the suspension of principal and/or interest payments on loans, and very generous fiscal incentives for house renovation in some countries.

Monetary policy also provided key support to the euro area housing market by preserving favourable financing conditions for households and firms. First, the Pandemic Emergency Purchase Programme (PEPP) announced in March 2020, by impacting yields especially at the long end of the maturity spectrum, exerted significant downward pressure on lending rates. This was particularly pronounced for mortgage rates, as they are typically linked to longer-term interest rates. Second, the negative interest rate policy continued to contribute to historically low lending rates, thereby supporting bank lending. Third, the targeted longer-term refinancing operations (TLTRO III) offered attractive bank funding conditions, which banks passed on to firms and households, even for the non-targeted segment of the facility (i.e. housing loans).[18] Overall, according to the ECB bank lending survey (BLS), the ECB's monetary policy measures contributed to an increase in housing lending volumes and an easing of bank lending conditions on new mortgages during the COVID-19 period.[19] As regards existing mortgages, households at the lower end of the income distribution seem to have benefited the most from the reduced interest rates via the so-called cash-flow effect of monetary policy, which increased their available resources for spending (Box 2).

Financing conditions remained favourable, especially for less risky households, supporting the robust demand for housing. Apart from the first two months of 2020, flows of housing loans remained robust, with the annual growth rate of the loan stock reaching 4.2% in the first quarter of 2021, a rate not observed since 2008, significantly moving in tandem with house prices. Households' demand for mortgages was met by historically low bank lending rates, which remained immune to the tightening in credit standards reported by banks in 2020 and to the increase in market rates in the first months of 2021. This muted response reflected favourable bank funding costs (buttressed by the policy support), but concealed a widening of lending margins for riskier borrowers and higher collateral requirements in the

16 Under short-time work schemes, firms experiencing economic difficulties could temporarily reduce the hours worked while providing their employees with income support from the government for the hours not worked.

17 For more details on the fiscal policy measures implemented during the COVID-19 pandemic, see "The initial fiscal policy responses of euro area countries to the COVID-19 crisis", op. cit. and "Public loan guarantees and bank lending in the COVID-19 period", *Economic Bulletin*, Issue 6, ECB, 2020.

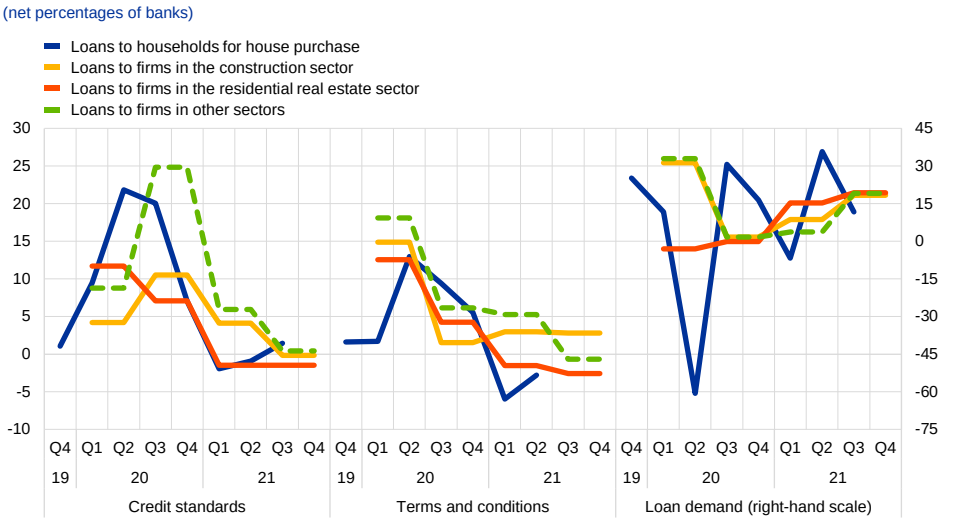
18 Moreover, from a microprudential policy perspective, ECB Banking Supervision provided important capital relief for banks, which created further space for bank balance sheet expansion.

19 See Section 3 of the April 2021 ECB bank lending survey (BLS).

context of deteriorated perceptions of households' creditworthiness. In the first half of 2021, tightening pressures on bank lending policies for housing loans vanished, primarily reflecting lower risk perceptions related to the improved economic outlook (Chart 5). The favourable developments observed during the second and third waves of the pandemic allowed households to experience a significantly smaller tightening of bank lending conditions during the COVID-19 period as a whole compared with previous crisis episodes (Chart 6).[20] The contribution of housing market prospects to loan demand was also strikingly different to that in previous crises in that it held up particularly well throughout the pandemic. Bank lending conditions for firms in the construction and the real estate sectors over the COVID-19 period were more favourable compared with those for firms in sectors that were hit harder by the containment measures.[21]

Chart 5

Bank lending conditions and loan demand for households and firms



Sources: ECB (BLS) and authors' calculations.
Notes: The net percentages are defined as the difference between the sum of the percentages for "tightened/increased considerably" and "tightened/increased somewhat" and the sum of the percentages for "eased/decreased somewhat" and "eased/decreased considerably". "Loans to firms in other sectors" is the unweighted average of loans to firms in manufacturing, services, wholesale and retail trade and commercial real estate. For loans to firms by sector, the questions have a biannual frequency, hence banks report on two quarters at once instead of one. Q3 21 and Q4 21 denote expectations indicated by banks in the July 2021 BLS.

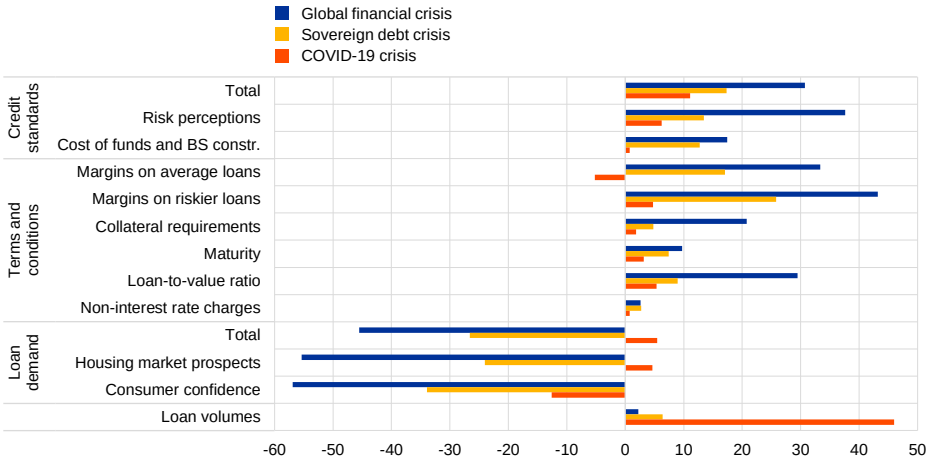
20 Previous crises had a more direct impact on the banking sector, which went through a process of significant balance sheet adjustment. This process constrained banks' intermediation capacity, resulting in tighter lending policies.

21 As with other sectors, firms in the construction and real estate sectors reduced their recourse to bank financing in the second half of 2020 on account of abated emergency liquidity needs and the significant precautionary buffers built up in the early stages of the pandemic (see Falagiarda, M. and Köhler-Ulbrich, P., "Bank lending to euro area firms – What have been the main drivers during the COVID-19 pandemic?", *European Economy: Banks, Regulation, and the Real Sector, Vol. 1, 2021, pp. 119-143)*. Moreover, during this period, loan demand continued to be dampened by high uncertainty, especially for the financing of fixed investment. In the first half of 2021, firms in the construction and real estate sectors started to significantly increase their demand for bank borrowing (Chart 6) owing to the improved economic outlook and robust demand for housing.

Chart 6

Bank lending conditions for housing loans, loan demand and loan volumes

(for BLS indicators: net percentages of banks, quarterly average over crisis episodes; for loan volumes: flows in EUR billions, quarterly averages over crisis episodes)



Sources: ECB (BLS), ECB (BSI) and authors' calculations.
Notes: The net percentages are defined as the difference between the sum of the percentages for "tightened/increased considerably" and "tightened/increased somewhat" and the sum of the percentages for "eased/decreased somewhat" and "eased/decreased considerably". "Risk perceptions" is the unweighted average of "general economic situation and outlook" and "housing market prospects, including expected house price developments". "Cost of funds and BS constr." stands for "Cost of funds and balance sheet constraints".

In a context of low interest rates, high uncertainty and large savings, housing demand has also been supported by investment motives. The demand for housing for investment purposes has been a distinctive feature of the recovery in housing markets that started in 2013.[22] This factor seems to have strengthened during the COVID-19 period, reflecting a further increase in the relative attractiveness of housing as an investment class and a further expansion of the availability of savings amid considerable economic uncertainty.[23] [24] Moreover, flows into real estate funds, albeit declining slightly in 2020, remained at relatively high levels, also as a share of residential investment. Although some of these funds could also be directed to commercial real estate or outside the euro area, this evidence suggests that private and institutional investors searching for yield and safety may have contributed to additional housing demand during the COVID-19 period.

Supply-side constraints have also exerted upward pressures on house prices. Constraints on housing supply have been an important factor behind housing market dynamics over the 2013-19 period. Following the significant decline in building permits in the aftermath of the pandemic outbreak, supply bottlenecks were further aggravated during the different waves of the pandemic (Chart 7). While in the first wave financing conditions and other factors (notably, containment measures) particularly constrained production, in the second and third waves supply bottlenecks

22 See the article entitled "The state of the housing market in the euro area", op. cit.

23 The impact of the forced accumulation of savings associated with the pandemic is discussed in the box entitled "The recovery of housing demand through the lens of the Consumer Expectations Survey" of this issue of the Economic Bulletin.

24 Estimates of the return on housing-related investment point to an increase in the relative attractiveness of investment in residential property vis-à-vis government bonds and deposits during the COVID-19 period. Increased housing returns may have in turn fuelled higher house price expectations, thereby further boosting the demand for housing.

were mainly due to labour and material shortages. The lack of (especially high-skilled) workers was also a major factor limiting production before the COVID-19 crisis,[25] but the shortage of materials reflected global supply-chain disruptions and a reallocation of resources induced by the outbreak of the pandemic, leading to increases in supplier delivery times and input costs. Overall, survey data suggest that, for construction firms, supply-side constraints increased relative to demand constraints during the COVID-19 period.

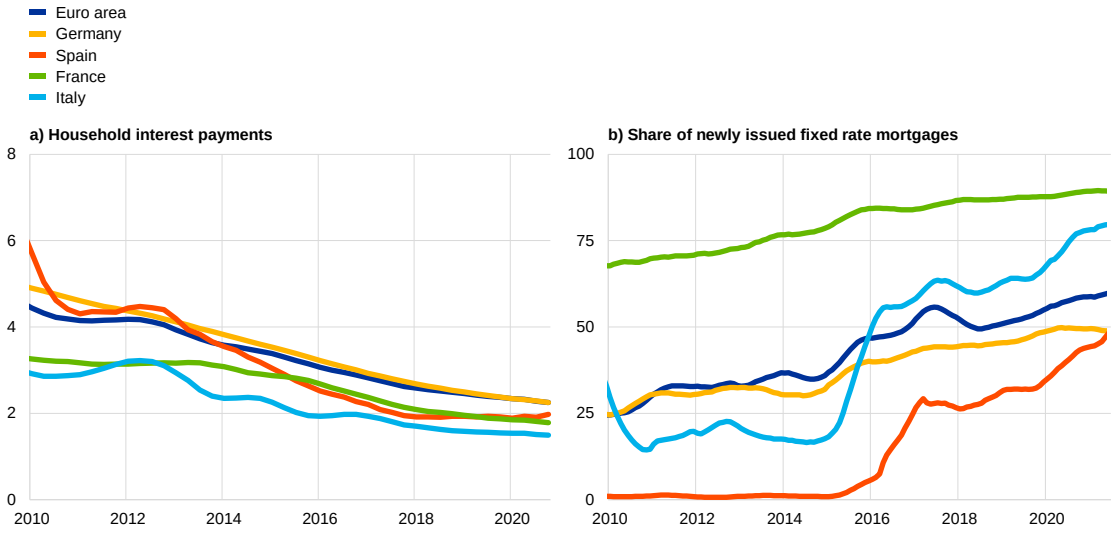
Box 2
Monetary policy and the cash-flow effect on households via mortgages

Prepared by Lucía Kazarian Avakian, Giulio Nicoletti and Christophe Van Nieuwenhuyze

This box assesses the benefit households received from lower interest payments on their existing mortgage debt since the beginning of the ECB's unconventional monetary policy in 2015. This so-called cash-flow effect of monetary policy contributed to the decrease in interest payments of the aggregate euro area household sector, which overall reached a record low of 2.2% of disposable income at the end of 2020 (Chart A, panel a). This positive effect helped households deal with the COVID-19 shock.

Chart A
Household interest payments and fixed rate mortgages

(panel a): percentages of gross disposable income; panel b): percentages)



Sources: Eurostat and ECB quarterly sectoral accounts (QSA) and ECB monthly data on euro area interest rates on loans and deposits (MIR).
Notes: Panel a): actual gross interest payments, i.e. including FISIM (financial intermediation services indirectly measured). Panel b): 12-month moving average of the share of new loans for house purchase with initial fixation period above ten years in total new loans for house purchase.

To investigate the distributional impact of this monetary policy transmission channel, we calculate the size of the advantage across the income distribution of households with a mortgage. Furthermore, we differentiate between the impact via adjustable rate mortgages (ARMs), which are relinked periodically to the change in short-term rates, and fixed rate mortgages (FRMs), which are affected by the change in long-term rates if households engage in refinancing their mortgage. Given

[25] See, for instance, the KfW-ifo Skilled Labour Barometer for German construction in June 2021.

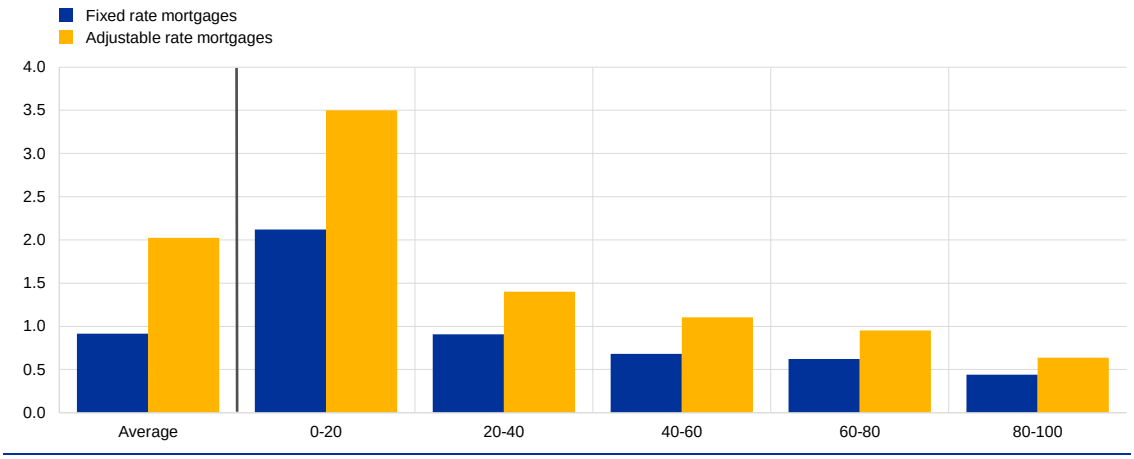
the relatively large decrease in long-term rates since 2015 and the rising share of FRMs (Chart A, panel b), the advantage obtained via this channel is likely to have increased.

We calculate the benefit across the joint income distribution of households with a mortgage in the five largest euro area economies, combining household-level information on mortgages and income with country-level information on interest rates. Considering all households with a mortgage in 2014 (based on the second wave of the Household Finance and Consumption Survey (HFCS)), we calculate the income gain they booked at the end of 2020 compared with their initial situation in 2014 as a result of lower interest payments on their mortgages. For ARMs, calculations are based on developments in the short-term rate (EURIBOR 3-month), while for FRMs,[26] they take into account developments in long-term interest rates and refinancing volumes. In general, the latter increase with the size of the interest advantage, i.e. with the gap between long-term rates on new mortgages and the rate on outstanding ones.

Chart B

Income gain through lower interest payments on mortgages by income percentile

(percentages of household gross income)



Sources: ECB (HFCS, MIR) and authors' calculations.
Notes: The chart shows, for the households with a mortgage in 2014 in Germany, Spain, France, Italy and the Netherlands and grouped according to the aggregate income quintiles over those countries (x-axis), the average income gain booked at the end of 2020 compared with the initial situation in 2014 as a result of lower interest charges on adjustable (ARMs) and fixed rate mortgages (FRMs). For ARMs, this is calculated by the change in the short-term rate (EURIBOR 3-month) times the value of the outstanding ARMs in 2014. The gain due to lower interest rates on FRMs is calculated by the product of three components: the outstanding amount of FRMs in 2014, the average share of households that renegotiated their loans over the period 2015-20, and the average interest advantage they booked computed as the average difference between renegotiated rates and the rates on new mortgages five years earlier.

The cash-flow effect benefited all households with a mortgage and was on average around 0.9% of gross income via FRMs and 2% via ARMs (Chart B), supporting – all else being equal – household balance sheets, including during the COVID-19 period.[27] In the latter period, the income gain might

[26] We consider all housing loans with an initial rate fixation period over ten years as FRMs, although these may allow for rate changes after this period which resemble ARM properties (e.g. rate changes every five years after the first ten years).

[27] Note that the part of these gains related to unconventional monetary policy would require the identification of the monetary policy shock. Such exercises confirm the larger effect via ARMs than via FRMs. See, for example, Pietrunti, M. and Signoretti, F. M., "Unconventional monetary policy and household debt: The role of cash-flow effects", *Journal of Macroeconomics*, Vol. 64, No 103201, June 2020. Similar to the methodology used here, Ehrmann, M. and Ziegelmeyer, M., "Mortgage choice in the euro area: Macroeconomic Determinants and the effect of monetary policy on debt burdens", *Journal of Money, Credit and Banking*, Vol. 49, March-April 2017, pp. 469-494 find that the largest impact is via ARMs, although these results date back to the period before the existence of unconventional monetary policy.

have taken the form of extra savings, contributing to the resilience of the housing market.[28] Furthermore, the cash-flow effect benefited low income households in particular, which were most exposed to labour income losses during the COVID-19 period.[29] As such, lower interest payments might have mitigated the overall negative impact on the income of debtors, thereby also dampening inequality forces,[30] the likelihood of payment arrears and the need to make extensive and prolonged recourse to moratoria.[31] Finally, lower long-term rates encouraged both refinancing and a higher share of FRMs, so that households have been able to lock in the low interest rates, enhancing their debt sustainability and reducing their interest sensitivity in the event that monetary policy tightens.

4 Prospects and risks for the euro area housing market

Several factors are likely to support housing market prospects in the near term. The expected recovery in economic activity – sustained by a successful vaccination campaign in the euro area – should hold up households' income and employment prospects, including when fiscal support gradually recedes. Financing conditions are likely to remain favourable, reflecting the policy support and the expected improvements in borrowers' creditworthiness. Recent lending dynamics and indications from the BLS, which tend to display good leading properties in around two to three quarters in terms of house prices and housing investment, point to continued dynamism in the housing market in the coming quarters. Housing investment is likely to continue its positive trend observed since the third quarter of 2020, reinforced by resilient house prices relative to construction costs, improving real disposable incomes and buoyant intentions to buy and renovate properties (Chart 7). In addition, a part of the savings accumulated during the pandemic could be redirected into the housing market amid a low-yield environment and the increased relative attractiveness of housing for investment purposes. The share of residential property in real estate portfolios is likely to increase since it is perceived as a safer asset in times of uncertainty (housing is a primary need) entailing stable income streams (rents).

Nevertheless, the outlook for the housing market remains highly dependent on uncertainties related to the pandemic. Adverse developments related to the COVID-19 pandemic, such as the possible spread of new variants, might weigh on

28 Given forced savings, marginal propensities to consume have been relatively low during the COVID-19 pandemic. See the box entitled "COVID-19 and the increase in household savings: precautionary or forced?", *Economic Bulletin*, Issue 6, ECB, 2020; and Christelis, D., Georgarakos, D., Jappelli, T. and Kenny, G., "The COVID-19 crisis and consumption: survey evidence from six EU countries", op. cit.

29 See Schnabel, I., "Unequal scars – distributional consequences of the pandemic", speech at the panel discussion "*Verteilung der Lasten der Pandemie*" ("Sharing the burden of the pandemic"), Deutscher Juristentag 2020, Frankfurt am Main, 18 September 2020 and the references therein.

30 See the article entitled "Monetary policy and inequality", *Economic Bulletin*, Issue 2, ECB, 2021.

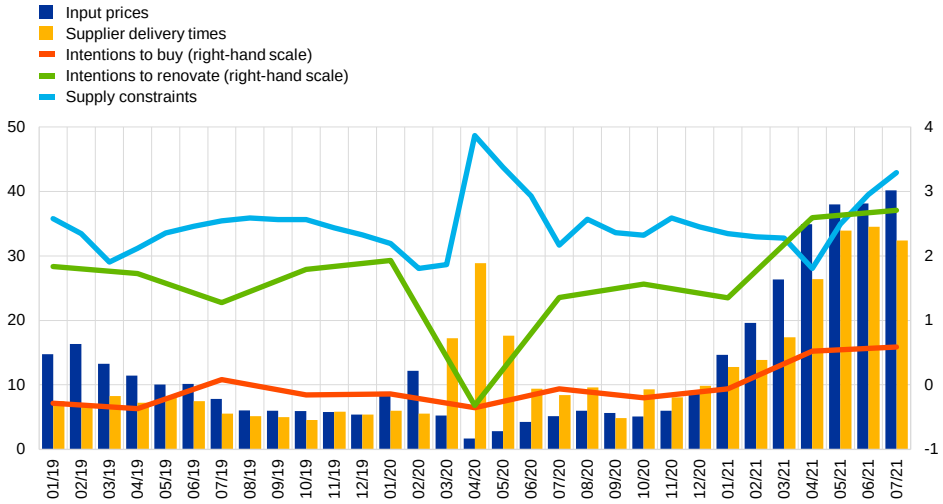
31 The positive impact of the cash-flow effect via mortgages on households goes hand-in-hand with a negative effect on banks' balance sheets. However, positive effects on banks' balance sheets also arise as a result of the improved creditworthiness of households. For a study on the overall impact of monetary policy on banks' profitability, see Altavilla, C., Bouchina, M. and Peydró, J.L., "Monetary policy and bank profitability in a low interest rate environment", *Economic Policy*, Vol. 33, Issue 96, October 2018, pp. 531-586.

housing market prospects, and particularly on housing demand, as observed at the beginning of the pandemic. Amid high uncertainty, the withdrawal of policy support measures is an additional factor that could possibly limit prospects for the housing market if such policies were to be phased out before the recovery is on track. In addition, the overall increase in risk-free interest rates observed since the beginning of 2021 may exert upward pressure on mortgage rates. Moreover, the developments in shortages of raw materials and the associated increases in supplier delivery times and input costs could negatively affect construction activity and exert strong upward pressure on prices in the near term (Chart 7). This would contribute to keeping house prices in the euro area at an elevated level,[32] thus possibly increasing the importance of and need for macroprudential measures (Box 3).

Chart 7

Euro area supply constraints, construction input prices, supplier delivery times and intentions to buy and renovate

(input prices and supplier delivery times: deviation from baseline (50); intentions to buy and renovate: standardised levels; supply constraints: levels)



Sources: European Commission, IHS Markit and own calculations.

Changes in housing preferences may also affect the housing market going forward. The COVID-19 pandemic may bring changes in preferences and behaviour that could influence housing demand over the medium-to-long term. Should work-from-home arrangements become more prevalent, housing demand may partly shift away from city centres towards suburban and rural areas, as the opportunity costs associated with peripheral working places would decrease in tandem with commuting time.[33] This could contribute to limiting upward pressure on rent and house prices in large cities characterised by limited housing supply. As observed in

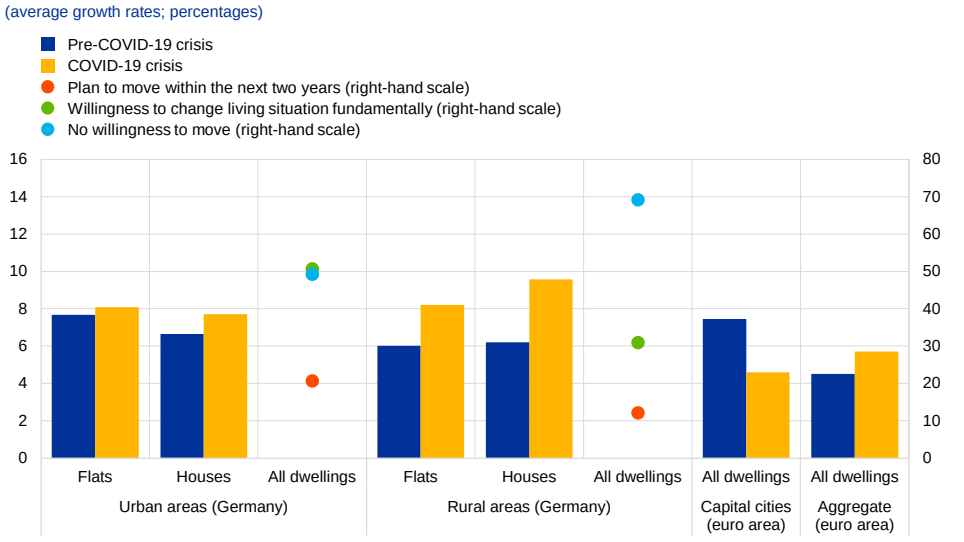
32 For further details, see the ECB's Financial Stability Review May 2021.

33 According to a survey by the German ifo Institute "Wie beeinflusst die Corona-Pandemie die Wohnortpräferenzen?", *ifo Schnelldienst*, Vol. 74, No 08, 2021, around 20% of households living in urban areas plan to move within the next two years in contrast to a share of 12% of households living in rural areas planning to move (Chart 8). For almost half of these respondents (46%), their decision was influenced by the COVID-19 pandemic.

other advanced economies,[34] preliminary evidence for some euro area countries tends to corroborate this narrative, hinting, for example, at buoyant house prices in rural areas in Germany and softening house price increases in capital cities in the euro area compared with the pre-pandemic period (Chart 8).[35] [36] The accelerated introduction of remote working arrangements slowed down the demand for commercial office and retail spaces, potentially opening up the possibility to convert some of these properties into residential housing in areas where supply is limited.[37] Both climate change and climate policies could also affect the housing market going forward. Investment in the energy efficiency of buildings could boost housing investment – also helped by fiscal incentives in some countries – thus lowering household spending on energy. In addition, properties meeting enhanced energy credentials could command higher prices, thus posing additional challenges for housing affordability.

Chart 8

Households' plans to move and price developments in urban areas vis-à-vis rural areas



Sources: ECB, DESTATIS, ifo Institute, Eurostat, national sources and own calculations.
Notes: Residential property prices for urban areas in Germany are calculated as average growth rates of metropolis, cities not attached to a district and urban districts, and for rural areas, as average growth rates of densely and sparsely populated rural districts. The pre-COVID-19 period spans from the fourth quarter of 2016 to the fourth quarter of 2019, and the COVID-19 crisis period runs from the first quarter of 2020 to the first quarter of 2021. The "willingness to move" of households living in urban areas is calculated as the average of households' responses from urban areas, suburban areas and small cities expressed as a percentage to a survey by the German ifo Institute. The "plan to move within the next two years" is calculated as the sum of percentages of households planning to move within the next six months, six to twelve months and within the next two years. The euro area aggregate series is a weighted average based on GDP weights, which includes Belgium, Germany, Estonia, Ireland, Spain, France, Italy, the Netherlands, Austria, Slovenia and Finland.

34 For further details, see "How Covid Has Reshaped Real Estate From New York to Singapore", Bloomberg, May 2021 and "The Impact of the COVID-19 Pandemic on the Demand for Density: Evidence from the U.S. Housing Market", Federal Reserve Bank of Dallas, August 2020, which show that in the United States the pandemic has led to a shift in housing demand away from neighbourhoods with high population density.

35 For further details, see the box entitled, "Euro area house price developments during the coronavirus pandemic", op. cit.

36 In March 2021 Ireland launched a plan to create a network of more than 400 remote working hubs, introducing tax breaks for individuals and companies which support work-from-home arrangements and launching a Rural Development Policy for the period 2021-25.

37 For further details, see "Brick by Brick", OECD, May 2021.

Box 3

Macroprudential policy for residential real estate before, during and after the COVID-19 pandemic

Prepared by Jan Hannes Lang, Marek Rusnák, Marco Lo Duca, Barbara Jarmulska

Prior to the COVID-19 pandemic, many euro area countries had activated macroprudential measures to address the build-up of residential real estate (RRE) vulnerabilities or to act as a prudent backstop. At the beginning of 2020, 14 euro area countries had in place borrower-based macroprudential measures (BBMs), such as loan-to-value (LTV), debt-service-to-income (DSTI), debt-to-income (DTI) or maturity limits.[38] In addition, seven euro area countries had activated macroprudential risk weight policies to increase the amount of capital banks need to hold against mortgage loans.[39] BBMs were put in place by many countries to act as a prudent backstop for lending standards, affecting only a small fraction of mortgage loan origination at the time of implementation, but providing an automatic limit to a potential widespread loosening of lending standards in the future. However, in some countries RRE vulnerabilities had been building up over preceding years, leading the European Systemic Risk Board (ESRB) to issue warnings and recommendations to six euro area countries in September 2019.[40] In some countries, macroprudential measures were therefore put in place to more actively contain the build-up of RRE vulnerabilities and increase bank resilience against associated systemic risks.

Following the outbreak of the pandemic, in line with the countercyclical nature of macroprudential policy, some national authorities eased macroprudential measures for RRE in order to limit the possible amplification effects of a tight macroprudential stance. In Malta, Portugal, Slovenia and Finland, national authorities adjusted existing BBMs at the height of the pandemic in spring 2020, fearing that the pandemic shock could constrain market access for solvent borrowers facing temporary income and liquidity shocks.[41] Two countries provided some capital headroom to absorb losses and meet credit demand. In the Netherlands, the planned implementation of an LTV-dependent risk weight floor for mortgage loans was postponed, and, in Finland, the existing risk weight floor for IRB mortgage loans was not extended beyond 2020. All of the above measures

38 The only euro area countries without BBMs in place at the beginning of 2020 were Germany, Greece, Spain, Italy and Luxembourg. Details on the BBMs implemented across countries can be found in Section 4 of Lang, J.H, Pirovano, M., Rusnák, M. and Schwarz, C., "Trends in residential real estate lending standards and implications for financial stability", Special Feature A, *Financial Stability Review*, European Central Bank, May 2020.

39 Risk weight policies affect capital ratios by increasing risk weights on banks' exposures to residential real estate. This generally results in higher risk-weighted exposures and implies that additional capital is needed to meet capital requirements. Belgium, Estonia and Finland had activated risk weight multipliers, add-ons and floors under Article 458 of the Capital Requirements Regulation (CRR) for domestic residential mortgage loans of banks using the internal ratings-based approach (IRB) to determine risk weights. Ireland, Malta and Slovenia had activated risk weight floors under Article 124 of the CRR for mortgage loans of banks using the standardised approach (STA) to determine risk weights. Luxembourg had recommendations in place regarding risk weight floors for mortgages under both the STA and IRB approaches.

40 Germany and France were subject to a warning by the ESRB, while Belgium, Luxembourg, the Netherlands and Finland received ESRB recommendations. See ESRB Press Release, "ESRB issues five warnings and six recommendations on medium-term residential real estate sector vulnerabilities", 23 September 2019.

41 In Portugal, in April 2020, it was decided that personal credit with maturities of up to two years will not need to comply with DSTI limits and is exempted from the recommendation of regular principal and interest payments until September 2020. In Slovenia, an amendment of the macroprudential restrictions on household lending to provide temporary flexibility when calculating income was implemented in May 2020. In Finland, the LTV/C limit for other than first-time buyers was restored from 85% to 90% in June 2020. In Malta, an extension of the phasing-in period for the LTV limit and the adoption of a temporary relaxation of the stressed DSTI limit of 40% was implemented in June 2020.

provided relief to new borrowers and banks alike and complemented other support measures, such as loan repayment moratoria or short-term working schemes (Section 3).

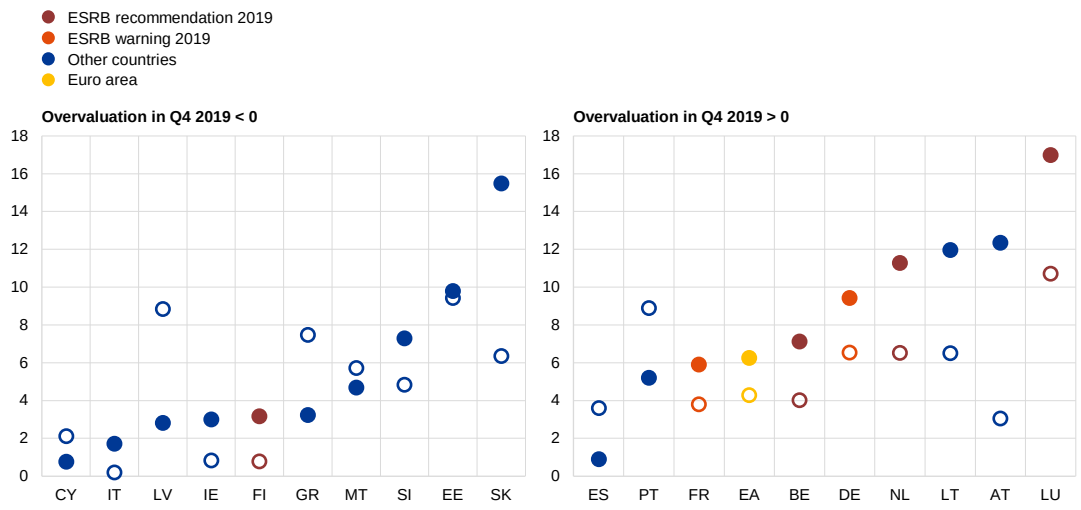
In most euro area countries, authorities did not adjust the BBMs that were already in place, as they were considered to be prudent back-stops for which adjustment had not been foreseen throughout the cycle. In addition, depending on the legal basis, there was a possibility that adjusting BBMs might involve lengthy processes compared with capital measures. However, Belgium and Estonia extended the application of risk weight measures on mortgages (under Article 458 of the CRR) in 2021 to retain bank resilience for accumulated RRE risks. Since existing risk weight measures affect minimum requirements or sectoral buffers, they might need to be released in the event that risks and losses in the RRE market materialise.

Chart A

Macroprudential measures should be considered in countries where vulnerabilities continue to build up as short-term downside risks recede

a) Annual RRE price growth in the fourth quarter of 2019 and the first quarter of 2021

(panel a): percentages; panel b): current policy considerations for RRE macroprudential measures)



b) Current policy considerations for RRE macroprudential measures

Sources: ECB and authors' calculations.
Notes: Panel a): Hollow dots refer to the values in the fourth quarter of 2019; coloured dots refer to the values in the first quarter of 2021 (the fourth quarter of 2020 for Cyprus and Finland). Average overvaluation denotes the average of the price-to-income ratio and the results of an econometric model in the fourth quarter of 2019.

Going forward, as pandemic risks recede, further macroprudential measures for RRE should be considered in countries where RRE vulnerabilities continue to build up. Robust house price and

mortgage loan growth continued throughout the pandemic, particularly in countries with pre-existing RRE vulnerabilities (Chart A, panel a). Nevertheless, the divergence between the RRE and economic cycles during the COVID-19 pandemic can imply downside risks in adverse growth scenarios, especially if government support is scaled back too early. In this context, macroprudential measures should be used in countries where vulnerabilities continue to build up as short-term downside risks recede (Chart A, panel b). In this regard, Luxembourg activated BBMs at the end of 2020, while in spring 2021 the Netherlands confirmed its intention to activate the LTV-dependent risk weight floor for mortgage loans.[42] These actions notwithstanding, further macroprudential measures could be needed in some euro area countries if current trends in RRE markets continue.

5 Conclusion

This article discussed developments in the euro area housing market since the outbreak of the COVID-19 pandemic. The mandatory and voluntary restrictions on economic agents' mobility in response to the first wave of the COVID-19 pandemic had a strong impact on activity without significantly impairing the upward trend in prices and loans, in contrast to the global financial crisis and the sovereign debt crisis. Moreover, the first wave of the pandemic induced greater diversity in housing investment across countries compared with previous crises, which is partly explained by the varying impact of restrictions along the income distribution.

Several factors supported the housing sector throughout the pandemic. The resilience of the housing market originated in part from the declining impact of restrictions after the first wave. Other factors included fiscal, monetary and macroprudential policy measures, continuously favourable financing conditions, the increased attractiveness of housing for investment purposes, as well as supply-side bottlenecks exerting upward pressure on house prices without significantly weighing on activity.

Overall, pandemic-related uncertainties and associated structural changes will continue to influence the prospects for the housing market. The broad-based economic recovery and the use of the large stock of accumulated savings are likely to support housing market prospects going forward. However, the outlook remains uncertain and depends on how the pandemic develops and the timing of the withdrawal of policy support. Changes in housing preferences may also lead to a reallocation within the housing market, away from commercial and urban residential properties and towards suburban and rural residential real estate. Heterogeneous developments across households are likely to persist and possibly intensify.

[42] The measure is expected to enter into effect on 1 January 2022, provided that the economic recovery continues in line with current expectations (DNB Financial Stability Report Spring 2021).

Statistics

Contents

Further information

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

Conventions used in the tables

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

1 External environment

1.1 Main trading partners, GDP and CPI

	GDP [1] (period-on-period percentage changes)						CPI (annual percentage changes)						
	G20	United States	United Kingdom	Japan	China	Memo item: euro area	OECD countries		United States	United Kingdom (HICP)	Japan	China	Memo item: euro area [2] (HICP)
							Total	excluding food and energy					
	1	2	3	4	5	6	7	8	9	10	11	12	13
2018	3.7	2.9	1.7	0.6	6.7	1.8	2.6	2.1	2.4	2.5	1.0	2.1	1.8
2019	2.8	2.3	1.7	0.0	6.0	1.6	2.1	2.2	1.8	1.8	0.5	2.9	1.2
2020	-3.3	-3.4	-9.7	-4.6	2.3	-6.4	1.4	1.8	1.2	0.9	0.0	2.5	0.3
2020 Q3	7.8	7.5	17.4	5.4	3.0	12.6	1.2	1.6	1.2	0.6	0.2	2.3	0.0
Q4	1.9	1.1	1.1	2.8	2.6	-0.4	1.2	1.6	1.2	0.5	-0.8	0.1	-0.3
2021 Q1	0.8	1.5	-1.4	-1.1	0.6	-0.3	1.9	1.7	1.9	0.6	-0.5	0.0	1.1
Q2	.	1.6	5.5	0.5	1.3	2.1	3.7	2.8	4.8	2.0	-0.8	1.1	1.8
2021 Apr.	-	-	-	-	-	-	3.3	2.4	4.2	1.5	-1.1	0.9	1.6
May	-	-	-	-	-	-	3.8	2.8	5.0	2.1	-0.8	1.3	2.0
June	-	-	-	-	-	-	4.0	3.1	5.4	2.5	-0.5	1.1	1.9
July	-	-	-	-	-	-	4.2	3.1	5.4	2.0	-0.3	1.0	2.2
Aug.	-	-	-	-	-	-	4.3	3.1	5.3	3.2	-0.4	0.8	3.0
Sep.	-	-	-	-	-	-	4.6	3.2	5.4	3.1	.	.	3.4

Sources: Eurostat (col. 6, 13); BIS (col. 9, 10, 11, 12); OECD (col. 1, 2, 3, 4, 5, 7, 8).
1) Quarterly data seasonally adjusted; annual data unadjusted.
2) Data refer to the changing composition of the euro area.

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
2018	53.4	55.0	53.3	52.1	52.3	54.6	53.1	53.8	50.8	4.3	3.2	5.6
2019	51.7	52.5	50.2	50.5	51.8	51.3	50.3	52.2	48.8	-0.4	-0.3	-0.4
2020	47.5	48.8	46.5	42.4	51.4	44.0	48.5	46.3	45.3	-4.3	-4.5	-4.2
2020 Q4	54.2	56.8	50.5	48.2	56.3	48.1	54.6	54.0	50.8	4.8	5.2	4.4
2021 Q1	54.3	59.3	49.1	48.4	52.3	49.9	53.8	54.5	50.3	4.5	1.8	7.5
Q2	57.5	65.3	61.9	49.6	53.0	56.8	53.9	58.8	52.9	1.6	1.4	1.9
Q3	52.9	56.8	56.3	47.4	50.6	58.4	51.7	53.2	50.3	.	.	.
2021 May	59.0	68.7	62.9	48.8	53.8	57.1	54.4	60.5	53.6	3.9	2.2	5.7
June	56.1	63.7	62.2	48.9	50.6	59.5	52.9	57.2	51.7	1.6	1.4	1.9
July	54.9	59.9	59.2	48.8	53.1	60.2	53.2	55.5	51.4	-0.4	0.5	-1.3
Aug.	51.3	55.4	54.8	45.5	47.2	59.0	50.6	51.5	49.5	-0.9	-0.2	-1.7
Sep.	52.4	55.0	54.9	47.9	51.4	56.2	51.4	52.8	50.1	.	.	.
Oct.	.	57.3	.	.	.	54.3	.	.	.	.	.	.

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
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
2020	-0.55	-0.46	-0.50	-0.43	-0.37	-0.31	0.64	-0.07
2021 Mar.	-0.56	-0.48	-0.55	-0.54	-0.52	-0.49	0.19	-0.08
Apr.	-0.57	-0.48	-0.56	-0.54	-0.52	-0.48	0.19	-0.07
May	-0.56	-0.48	-0.56	-0.54	-0.51	-0.48	0.15	-0.09
June	-0.56	-0.48	-0.55	-0.54	-0.51	-0.48	0.13	-0.09
July	-0.57	-0.48	-0.56	-0.54	-0.52	-0.49	0.13	-0.08
Aug.	-0.57	-0.48	-0.56	-0.55	-0.53	-0.50	0.12	-0.10
Sep.	-0.57	-0.49	-0.56	-0.55	-0.52	-0.49	0.12	-0.08

Source: Refinitiv and ECB calculations.

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
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
2020	-0.75	-0.76	-0.77	-0.72	-0.57	0.19	0.80	0.32	-0.77	-0.77	-0.60	-0.24
2021 Mar.	-0.64	-0.69	-0.72	-0.62	-0.28	0.41	1.68	0.82	-0.75	-0.73	-0.32	0.37
Apr.	-0.63	-0.68	-0.70	-0.57	-0.18	0.50	1.57	0.80	-0.73	-0.70	-0.21	0.53
May	-0.63	-0.68	-0.69	-0.54	-0.15	0.53	1.54	0.75	-0.72	-0.67	-0.16	0.57
June	-0.65	-0.69	-0.70	-0.56	-0.20	0.49	1.40	0.68	-0.72	-0.68	-0.22	0.45
July	-0.66	-0.75	-0.80	-0.75	-0.44	0.31	1.16	0.52	-0.83	-0.86	-0.50	0.16
Aug.	-0.68	-0.73	-0.77	-0.68	-0.39	0.34	1.24	0.56	-0.79	-0.79	-0.43	0.16
Sep.	-0.71	-0.73	-0.72	-0.54	-0.17	0.56	1.41	0.78	-0.74	-0.66	-0.16	0.46

Source: ECB calculations.

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
2018	375.5	3,386.6	766.3	264.9	172.6	115.8	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	183.7	111.9	155.8	650.9	528.2	322.0	294.2	772.7	2,915.5	21,697.2
2020	360.0	3,274.3	758.9	226.8	163.2	83.1	128.6	631.4	630.2	347.1	257.6	831.9	3,217.3	22,703.5
2021 Mar.	422.4	3,813.3	911.1	271.6	168.4	97.0	159.1	774.6	770.1	367.2	264.5	838.1	3,910.5	29,315.3
Apr.	440.1	3,987.3	952.7	286.0	177.2	93.2	161.5	807.2	835.4	387.5	267.3	874.0	4,141.2	29,426.8
May	443.8	4,003.6	959.5	290.0	183.0	94.8	167.8	808.7	811.7	384.1	278.3	870.2	4,169.6	28,517.1
June	455.3	4,105.8	958.5	305.3	188.6	97.4	168.5	831.8	850.4	375.9	287.2	883.4	4,238.5	28,943.2
July	453.8	4,062.6	979.0	300.5	190.2	91.2	162.2	835.4	875.2	372.0	290.2	896.1	4,363.7	28,118.8
Aug.	468.5	4,177.0	1,014.5	303.3	191.9	91.6	169.0	865.0	938.2	380.0	303.6	922.1	4,454.2	27,692.7
Sep.	465.5	4,158.3	993.9	295.0	188.1	93.9	169.0	863.3	969.5	371.3	294.8	917.5	4,449.6	29,893.6

Source: Refinitiv.

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
2020 Sep.	0.02	0.35	0.19	0.70	5.23	15.86	5.08	5.25	5.75	1.94	1.39	1.61	1.31	1.37	1.66	1.38
Oct.	0.02	0.35	0.20	0.69	5.18	15.82	5.14	5.26	5.80	2.03	1.37	1.56	1.27	1.36	1.64	1.36
Nov.	0.02	0.35	0.20	0.71	5.11	15.78	5.01	5.25	5.90	2.04	1.37	1.54	1.29	1.35	1.63	1.35
Dec.	0.01	0.35	0.17	0.72	4.99	15.78	4.93	5.08	5.71	1.93	1.35	1.52	1.27	1.33	1.62	1.32
2021 Jan.	0.01	0.35	0.22	0.68	5.00	15.81	4.84	5.32	5.87	1.91	1.35	1.49	1.29	1.35	1.60	1.33
Feb.	0.01	0.35	0.23	0.66	5.01	15.74	5.05	5.25	5.86	1.98	1.30	1.48	1.27	1.32	1.58	1.31
Mar.	0.01	0.35	0.20	0.61	4.98	15.77	4.88	5.12	5.72	1.94	1.32	1.43	1.24	1.32	1.58	1.31
Apr.	0.01	0.35	0.21	0.62	4.89	15.75	5.16	5.17	5.78	1.98	1.32	1.49	1.27	1.31	1.59	1.31
May	0.01	0.34	0.18	0.57	4.88	15.75	5.16	5.31	5.93	2.04	1.32	1.43	1.26	1.31	1.61	1.32
June	0.01	0.34	0.16	0.59	4.88	15.70	5.16	5.15	5.77	1.94	1.31	1.43	1.26	1.30	1.60	1.32
July	0.01	0.34	0.19	0.58	4.77	15.57	5.31	5.24	5.85	1.98	1.34	1.45	1.27	1.30	1.61	1.32
Aug. [(p)]	0.01	0.34	0.17	0.59	4.83	15.70	5.76	5.30	5.91	2.04	1.33	1.47	1.24	1.28	1.59	1.32

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
2020 Sep.	0.00	-0.20	0.26	1.88	1.91	2.10	1.94	1.54	1.43	1.49	1.22	1.31	1.31	1.51
Oct.	0.00	-0.21	0.26	1.82	1.91	2.20	1.96	1.55	1.46	1.50	1.22	1.42	1.40	1.53
Nov.	-0.01	-0.20	0.42	1.83	1.97	2.00	1.98	1.57	1.41	1.47	1.22	1.29	1.30	1.51
Dec.	-0.01	-0.18	0.25	1.83	2.01	1.94	1.94	1.61	1.42	1.44	1.34	1.23	1.27	1.51
2021 Jan.	-0.01	-0.14	0.39	1.84	2.14	2.00	1.92	1.61	1.44	1.41	1.17	1.18	1.29	1.50
Feb.	-0.01	-0.21	0.25	1.84	1.96	2.00	1.95	1.58	1.44	1.43	1.15	1.22	1.23	1.48
Mar.	-0.01	-0.11	0.22	1.82	1.91	1.97	2.02	1.56	1.45	1.40	1.09	0.71	1.23	1.39
Apr.	-0.01	-0.18	0.25	1.80	2.04	1.96	1.98	1.57	1.44	1.40	1.32	1.33	1.38	1.56
May	-0.01	-0.23	0.19	1.79	1.87	1.95	2.04	1.57	1.45	1.42	1.16	1.17	1.27	1.46
June	-0.02	-0.31	0.27	1.84	1.89	1.97	2.02	1.55	1.43	1.54	1.20	1.13	1.24	1.46
July	-0.02	-0.31	0.13	1.72	1.82	2.14	2.00	1.59	1.43	1.37	1.28	1.32	1.16	1.48
Aug. [(p)]	-0.03	-0.35	0.17	1.76	1.79	1.90	2.02	1.56	1.46	1.37	1.23	1.12	1.14	1.44

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														
2018	1,215	503	170	.	72	424	47	389	171	66	.	41	76	35
2019	1,283	550	181	.	85	406	61	415	177	80	.	47	73	38
2020	1,530	455	145	.	98	714	118	455	177	70	.	45	114	49
2021 Mar.	1,588	487	150	.	95	726	130	460	218	51	.	31	118	43
Apr.	1,563	475	147	.	98	706	136	416	180	42	.	39	107	47
May	1,537	464	151	.	100	692	130	410	187	48	.	37	105	33
June	1,542	481	152	.	90	694	126	450	217	56	.	34	105	39
July	1,540	478	149	.	101	688	124	466	224	44	.	39	109	51
Aug.	1,538	492	148	.	99	678	121	411	230	40	.	25	91	25
Long-term														
2018	15,748	3,688	3,162	.	1,249	7,022	627	228	64	68	.	15	75	6
2019	16,315	3,817	3,397	.	1,324	7,152	626	247	69	74	.	20	78	7
2020	17,213	3,892	3,136	.	1,453	8,006	725	296	68	71	.	27	114	16
2021 Mar.	17,704	3,970	3,226	.	1,471	8,274	763	371	107	94	.	27	125	17
Apr.	17,704	3,956	3,214	.	1,467	8,308	760	313	64	74	.	17	146	12
May	17,830	3,947	3,234	.	1,489	8,393	768	269	46	69	.	21	121	12
June	18,005	3,981	3,270	.	1,504	8,473	779	337	75	82	.	29	136	15
July	18,108	3,992	3,313	.	1,507	8,517	779	299	56	97	.	17	119	10
Aug.	18,136	3,991	3,306	.	1,506	8,556	778	136	28	35	.	4	66	3

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											
2018	16,962.7	4,190.4	3,332.4	.	1,320.6	7,445.8	673.5	7,023.4	465.0	1,099.2	5,459.2
2019	17,597.8	4,367.2	3,577.7	.	1,408.4	7,558.1	686.5	8,586.6	538.4	1,410.6	6,637.6
2020	18,742.8	4,347.3	3,281.1	.	1,550.8	8,720.3	843.3	8,448.2	469.3	1,321.5	6,657.4
2021 Mar.	19,291.1	4,457.1	3,376.3	.	1,566.2	8,999.1	892.5	9,237.3	542.9	1,467.6	7,226.8
Apr.	19,266.5	4,430.6	3,360.8	.	1,565.5	9,013.8	895.8	9,456.9	554.3	1,467.6	7,434.9
May	19,366.9	4,410.2	3,384.8	.	1,588.4	9,085.1	898.3	9,664.8	575.7	1,508.7	7,580.5
June	19,547.5	4,462.0	3,421.2	.	1,593.8	9,166.3	904.2	9,791.5	564.9	1,521.5	7,705.2
July	19,648.0	4,470.2	3,462.2	.	1,607.6	9,204.3	903.8	9,911.0	559.2	1,526.8	7,825.0
Aug.	19,674.4	4,483.1	3,453.8	.	1,605.1	9,233.7	898.7	10,178.8	587.9	1,610.3	7,980.6
Growth rate											
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	4.9	.	5.6	1.5	1.8	0.0	0.5	0.0	0.0
2020	7.4	1.2	2.6	.	12.4	10.9	24.3	1.1	0.0	3.1	0.8
2021 Mar.	8.5	2.2	4.2	.	11.9	11.9	24.5	1.7	1.4	5.0	1.1
Apr.	7.0	0.9	4.6	.	8.1	10.2	19.5	2.0	1.4	5.3	1.5
May	5.6	0.1	5.0	.	5.4	8.1	12.2	2.3	1.4	6.1	1.6
June	4.4	-0.4	4.2	.	4.2	6.6	9.6	2.5	1.8	6.4	1.7
July	4.5	0.2	5.0	.	3.7	6.2	10.0	2.4	1.8	6.5	1.7
Aug.	4.1	0.7	4.3	.	3.4	5.4	9.1	2.5	1.8	7.6	1.5

Source: ECB.

2 Financial developments

2.8 Effective exchange rates [1)]

(period averages; index: 1999 Q1=100)

	EER-19						EER-42	
	Nominal	Real CPI	Real PPI	Real GDP deflator	Real ULCM	Real ULCT	Nominal	Real CPI
	1	2	3	4	5	6	7	8
2018	99.9	95.5	94.1	90.6	80.7	89.6	117.3	94.9
2019	98.1	93.1	92.9	88.9	77.9	87.1	115.4	92.3
2020	99.6	93.4	94.1	89.3	77.4	87.5	119.4	93.8
2020 Q4	101.2	94.6	95.4	90.3	74.5	87.9	122.3	95.5
2021 Q1	100.7	94.6	95.2	89.9	74.3	87.4	121.7	95.3
Q2	100.5	94.1	94.9	88.8	72.8	86.1	121.9	94.9
Q3	99.5	93.3	94.4	.	.	.	120.5	94.0
2021 Apr.	100.6	94.2	94.9	-	-	-	121.9	95.1
May	100.8	94.3	95.1	-	-	-	122.3	95.2
June	100.2	93.7	94.8	-	-	-	121.5	94.5
July	99.7	93.5	94.5	-	-	-	120.8	94.2
Aug.	99.3	93.2	94.2	-	-	-	120.4	93.9
Sep.	99.4	93.2	94.4	-	-	-	120.4	93.8
Percentage change versus previous month								
2021 Sep.	0.1	0.1	0.2	-	-	-	0.0	-0.1
Percentage change versus previous year								
2021 Sep.	-2.1	-1.7	-1.3	-	-	-	-1.7	-2.0

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
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
2020	7.875	7.538	26.455	7.454	351.249	121.846	4.443	0.890	4.8383	10.485	1.071	1.142
2020 Q4	7.901	7.559	26.667	7.443	360.472	124.607	4.505	0.903	4.8718	10.268	1.078	1.193
2021 Q1	7.808	7.572	26.070	7.437	361.206	127.806	4.546	0.874	4.8793	10.120	1.091	1.205
Q2	7.784	7.528	25.638	7.436	354.553	131.930	4.529	0.862	4.9240	10.141	1.098	1.206
Q3	7.626	7.497	25.500	7.437	353.871	129.763	4.566	0.855	4.9319	10.195	1.083	1.179
2021 Apr.	7.805	7.568	25.924	7.437	360.583	130.489	4.561	0.865	4.9231	10.162	1.103	1.198
May	7.811	7.523	25.558	7.436	353.647	132.569	4.528	0.863	4.9250	10.147	1.097	1.215
June	7.739	7.498	25.454	7.436	349.937	132.631	4.501	0.859	4.9238	10.117	1.094	1.205
July	7.654	7.503	25.636	7.437	357.257	130.349	4.562	0.856	4.9255	10.198	1.086	1.182
Aug.	7.624	7.496	25.470	7.437	351.843	129.284	4.569	0.853	4.9232	10.216	1.076	1.177
Sep.	7.601	7.492	25.392	7.436	352.514	129.656	4.568	0.857	4.9471	10.171	1.086	1.177
Percentage change versus previous month												
2021 Sep.	-0.3	0.0	-0.3	0.0	0.2	0.3	0.0	0.5	0.5	-0.4	0.9	0.0
Percentage change versus previous year												
2021 Sep.	-5.4	-0.7	-5.0	-0.1	-2.2	4.1	2.1	-5.8	1.8	-2.5	0.7	-0.2

Source: ECB.

2 Financial developments

2.10 Euro area balance of payments, financial account

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

	Total [1]			Direct investment		Portfolio investment		Net financial derivatives	Other investment		Reserve assets	Memo: Gross external debt
	Assets	Liabilities	Net	Assets	Liabilities	Assets	Liabilities		Assets	Liabilities		
	1	2	3	4	5	6	7	8	9	10	11	12
Outstanding amounts (international investment position)												
2020 Q3	28,055.9	28,650.3	-594.4	11,129.6	9,381.6	9,997.8	12,579.7	-91.7	6,110.7	6,689.0	909.5	15,163.1
Q4	28,374.9	28,979.5	-604.6	11,045.2	9,365.9	10,695.1	12,875.6	-82.2	5,836.9	6,738.0	879.7	14,854.7
2021 Q1	29,652.8	30,301.7	-649.0	11,379.0	9,479.4	11,437.8	13,678.6	-122.1	6,108.6	7,143.7	849.4	15,485.7
Q2	30,116.9	30,693.1	-576.2	11,342.2	9,459.7	11,950.1	14,081.7	-114.2	6,069.7	7,151.7	869.0	15,388.9
Outstanding amounts as a percentage of GDP												
2021 Q2	255.2	260.1	-4.9	96.1	80.2	101.3	119.3	-1.0	51.4	60.6	7.4	130.4
Transactions												
2020 Q3	195.4	75.0	120.4	33.6	-7.4	94.7	85.5	-31.3	95.1	-3.1	3.3	-
Q4	80.6	-48.2	128.8	-59.1	45.4	348.7	-225.1	-14.5	-196.6	131.5	2.1	-
2021 Q1	523.0	425.0	97.9	100.7	-7.1	266.3	178.8	6.4	152.6	253.4	-3.1	-
Q2	194.3	93.6	100.7	-37.2	-38.0	227.6	87.0	8.5	-12.1	44.6	7.5	-
2021 Mar.	78.0	74.0	4.0	12.8	-6.5	82.4	89.3	-5.3	-11.4	-8.9	-0.5	-
Apr.	200.6	193.9	6.7	30.1	5.4	56.4	39.7	4.5	109.0	148.8	0.7	-
May	14.0	-26.3	40.3	-51.3	-65.1	75.2	4.7	-2.1	-9.1	34.1	1.4	-
June	-20.4	-74.1	53.7	-16.0	21.6	96.0	42.6	6.2	-111.9	-138.2	5.3	-
July	143.3	102.5	40.8	23.1	-10.7	22.6	40.9	8.9	89.0	72.2	-0.3	-
Aug.	185.5	183.4	2.2	5.9	-6.9	45.2	19.7	-5.9	18.2	170.6	122.1	-
12-month cumulated transactions												
2021 Aug.	1,105.2	684.7	420.5	-9.1	-37.3	941.6	129.3	-6.3	48.3	592.7	130.8	-
12-month cumulated transactions as a percentage of GDP												
2021 Aug.	9.4	5.8	3.6	-0.1	-0.3	8.0	1.1	-0.1	0.4	5.0	1.1	-

Source: ECB.

1) Net financial derivatives are included in total assets.

3 Economic activity

3.1 GDP and expenditure components

(quarterly data seasonally adjusted; annual data unadjusted)

	GDP											
	Total	Domestic demand								External balance [1]		
		Total	Private consumption	Government consumption	Gross fixed capital formation				Changes in inventories [2]	Total	Exports [1]	Imports [1]
						Total construction	Total machinery	Intellectual property products				
	1	2	3	4	5	6	7	8	9	10	11	12
	Current prices (EUR billions)											
2018	11,600.2	11,132.8	6,223.0	2,369.5	2,430.6	1,177.5	746.1	500.5	109.6	467.5	5,571.6	5,104.2
2019	11,982.7	11,577.1	6,378.5	2,456.6	2,652.5	1,253.6	770.3	621.7	89.4	405.6	5,765.4	5,359.7
2020	11,400.4	10,976.4	5,902.0	2,573.5	2,494.9	1,216.3	681.9	589.7	6.1	423.9	5,173.4	4,749.4
2020 Q3	2,917.8	2,778.0	1,529.1	648.8	622.3	311.8	179.8	128.9	-22.1	139.7	1,300.0	1,160.3
Q4	2,927.3	2,787.7	1,485.8	661.2	641.4	318.1	182.9	138.6	-0.8	139.5	1,364.2	1,224.6
2021 Q1	2,939.1	2,807.9	1,470.4	663.0	645.8	324.7	185.4	134.0	28.8	131.2	1,399.6	1,268.5
Q2	3,003.1	2,879.3	1,527.3	669.8	659.1	334.9	187.7	134.7	23.0	123.8	1,463.5	1,339.7
	as a percentage of GDP											
2020	100.0	96.3	51.8	22.6	21.9	10.7	6.0	5.2	0.1	3.7	-	-
	Chain-linked volumes (prices for the previous year)											
	quarter-on-quarter percentage changes											
2020 Q3	12.6	10.5	14.5	5.5	13.9	14.7	24.8	0.0	-	-	16.4	11.7
Q4	-0.4	-0.3	-3.2	0.8	2.7	1.5	1.8	6.6	-	-	4.2	4.8
2021 Q1	-0.3	-0.4	-2.3	-0.5	0.0	0.6	1.8	-3.9	-	-	1.1	1.0
Q2	2.1	2.1	3.4	1.2	1.1	1.4	0.5	1.2	-	-	2.7	2.8
	annual percentage changes											
2018	1.8	1.8	1.5	1.1	3.1	3.9	3.7	0.4	-	-	3.6	3.8
2019	1.6	2.5	1.3	1.8	6.7	3.3	1.8	22.0	-	-	2.7	4.7
2020	-6.4	-6.2	-7.9	1.3	-7.0	-4.6	-12.0	-5.9	-	-	-9.1	-9.1
2020 Q3	-4.0	-4.2	-4.5	2.7	-4.0	-2.7	-7.9	-1.5	-	-	-8.8	-9.6
Q4	-4.4	-6.5	-7.6	3.3	-10.1	-0.5	-4.8	-30.6	-	-	-4.9	-9.3
2021 Q1	-1.2	-3.8	-5.6	2.9	-6.1	2.7	6.8	-31.6	-	-	-0.2	-5.7
Q2	14.2	12.0	12.1	7.1	18.2	18.8	30.1	3.6	-	-	26.0	21.6
	contributions to quarter-on-quarter percentage changes in GDP; percentage points											
2020 Q3	12.6	10.2	7.5	1.3	2.9	1.5	1.4	0.0	-1.6	2.4	-	-
Q4	-0.4	-0.3	-1.7	0.2	0.6	0.2	0.1	0.3	0.6	-0.1	-	-
2021 Q1	-0.3	-0.4	-1.2	-0.1	0.0	0.1	0.1	-0.2	0.9	0.1	-	-
Q2	2.1	2.0	1.7	0.3	0.2	0.2	0.0	0.1	-0.2	0.1	-	-
	contributions to annual percentage changes in GDP; percentage points											
2018	1.8	1.7	0.8	0.2	0.6	0.4	0.2	0.0	0.1	0.1	-	-
2019	1.6	2.4	0.7	0.4	1.4	0.3	0.1	0.9	-0.1	-0.8	-	-
2020	-6.4	-6.0	-4.2	0.3	-1.5	-0.5	-0.8	-0.3	-0.5	-0.4	-	-
2020 Q3	-4.0	-4.0	-2.4	0.6	-0.9	-0.3	-0.5	-0.1	-1.3	0.0	-	-
Q4	-4.4	-6.3	-4.1	0.7	-2.4	-0.1	-0.3	-2.0	-0.6	2.0	-	-
2021 Q1	-1.2	-3.7	-2.9	0.6	-1.4	0.3	0.4	-2.1	0.1	2.4	-	-
Q2	14.2	11.7	6.2	1.7	3.8	2.0	1.7	0.2	-0.1	2.5	-	-

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)											
2018	10,395.4	175.4	2,055.6	525.8	1,963.1	499.9	477.2	1,170.0	1,210.2	1,960.3	358.0	1,204.8
2019	10,741.0	178.5	2,099.1	561.4	2,041.8	531.4	478.9	1,204.9	1,250.1	2,025.7	369.3	1,241.7
2020	10,268.6	176.6	1,969.5	552.6	1,800.2	545.0	469.0	1,211.2	1,168.3	2,054.3	321.9	1,131.7
2020 Q3	2,626.9	44.2	505.5	142.3	474.2	139.9	116.8	305.4	295.1	519.5	84.0	290.9
Q4	2,634.4	43.7	521.3	146.7	458.8	139.5	117.2	305.7	302.0	522.2	77.5	292.8
2021 Q1	2,647.5	44.0	532.3	145.7	455.8	141.5	118.6	306.3	303.0	523.3	77.1	291.5
Q2	2,696.0	44.9	534.4	149.1	478.3	145.0	118.4	309.3	306.1	529.9	80.6	307.1
	as a percentage of value added											
2020	100.0	1.7	19.2	5.4	17.5	5.3	4.6	11.8	11.4	20.0	3.1	-
	Chain-linked volumes (prices for the previous year)											
	quarter-on-quarter percentage changes											
2020 Q3	12.5	0.7	16.1	15.0	23.3	7.5	2.7	3.2	12.0	9.4	24.1	13.0
Q4	-0.4	0.6	3.3	2.2	-3.6	-0.7	-0.4	-0.3	1.8	-1.3	-11.4	-0.3
2021 Q1	0.0	-3.0	1.0	-1.1	-1.0	2.0	1.3	-0.3	0.3	0.0	-0.7	-3.3
Q2	1.8	0.8	0.3	1.2	4.5	2.3	0.7	1.0	0.9	1.7	6.0	4.8
	annual percentage changes											
2018	1.8	-0.7	1.9	2.2	1.5	6.4	0.2	1.4	4.0	0.7	1.3	1.7
2019	1.6	1.7	0.5	2.0	2.4	5.6	0.4	1.4	1.7	1.1	1.6	1.6
2020	-6.3	-0.7	-6.8	-5.3	-13.7	1.2	-1.0	-0.8	-7.9	-2.9	-17.1	-6.5
2020 Q3	-4.1	-0.2	-5.0	-3.4	-9.8	3.0	-0.3	0.0	-7.2	0.1	-11.6	-3.5
Q4	-4.5	-0.8	-1.3	-0.7	-12.8	1.2	-0.8	-0.8	-5.6	-1.5	-21.8	-3.7
2021 Q1	-1.3	-1.0	3.1	0.5	-8.2	3.8	1.5	-0.1	-2.5	0.8	-16.5	-0.4
Q2	14.2	-0.8	21.6	17.5	22.8	11.5	4.4	3.6	15.4	9.9	15.7	14.3
	contributions to quarter-on-quarter percentage changes in value added; percentage points											
2020 Q3	12.5	0.0	3.0	0.8	3.8	0.4	0.1	0.4	1.4	1.9	0.7	-
Q4	-0.4	0.0	0.6	0.1	-0.6	0.0	0.0	0.0	0.2	-0.3	-0.4	-
2021 Q1	0.0	-0.1	0.2	-0.1	-0.2	0.1	0.1	0.0	0.0	0.0	0.0	-
Q2	1.8	0.0	0.1	0.1	0.8	0.1	0.0	0.1	0.1	0.3	0.2	-
	contributions to annual percentage changes in value added; percentage points											
2018	1.8	0.0	0.4	0.1	0.3	0.3	0.0	0.2	0.5	0.1	0.0	-
2019	1.6	0.0	0.1	0.1	0.4	0.3	0.0	0.2	0.2	0.2	0.1	-
2020	-6.3	0.0	-1.3	-0.3	-2.6	0.1	0.0	-0.1	-0.9	-0.5	-0.6	-
2020 Q3	-4.1	0.0	-1.0	-0.2	-1.9	0.1	0.0	0.0	-0.8	0.0	-0.4	-
Q4	-4.5	0.0	-0.2	0.0	-2.4	0.1	0.0	-0.1	-0.7	-0.3	-0.7	-
2021 Q1	-1.3	0.0	0.6	0.0	-1.5	0.2	0.1	0.0	-0.3	0.2	-0.6	-
Q2	14.2	0.0	4.0	0.9	3.7	0.6	0.2	0.4	1.7	2.0	0.5	-

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													
2018	100.0	85.9	14.1	3.1	14.6	6.0	25.0	2.9	2.4	1.0	14.0	24.3	6.8
2019	100.0	86.0	14.0	3.0	14.6	6.1	25.0	2.9	2.4	1.0	14.0	24.3	6.7
2020	100.0	86.0	14.0	3.0	14.5	6.2	24.5	3.0	2.4	1.0	13.9	24.9	6.6
annual percentage changes													
2018	1.6	1.9	0.0	-0.4	1.5	2.6	1.6	3.8	-1.0	2.4	2.8	1.4	0.3
2019	1.3	1.5	0.2	-2.4	1.1	2.5	1.5	3.3	0.0	1.6	1.4	1.4	0.4
2020	-1.5	-1.5	-1.7	-2.4	-1.8	0.7	-3.7	1.5	-0.5	-0.2	-2.4	0.9	-3.3
2020 Q3	-2.0	-2.0	-1.9	-1.8	-2.7	0.8	-4.3	1.1	-0.7	0.8	-3.5	0.8	-3.3
Q4	-1.8	-1.8	-1.5	-1.6	-2.3	0.8	-4.7	1.6	-0.4	1.7	-2.1	1.1	-4.1
2021 Q1	-1.8	-1.8	-1.3	0.4	-2.2	1.4	-5.5	2.2	-0.4	1.4	-1.7	1.3	-4.8
Q2	1.9	2.3	-0.1	3.6	-0.4	4.7	0.4	4.5	0.9	2.0	4.4	2.5	1.5
Hours worked													
as a percentage of total hours worked													
2018	100.0	81.1	18.9	4.3	15.0	6.7	25.9	3.0	2.5	1.0	13.8	21.7	6.1
2019	100.0	81.3	18.7	4.1	14.9	6.8	25.9	3.1	2.4	1.0	13.9	21.7	6.1
2020	100.0	82.0	18.0	4.3	14.9	6.9	24.4	3.3	2.6	1.1	13.8	23.1	5.7
annual percentage changes													
2018	1.7	2.2	0.0	-0.2	1.4	3.2	1.8	3.9	-1.0	3.1	3.1	1.2	0.7
2019	1.0	1.3	-0.2	-3.3	0.5	2.3	1.1	3.3	0.3	1.9	1.3	1.3	0.2
2020	-7.4	-6.7	-10.6	-3.0	-7.3	-6.1	-12.9	-1.6	-2.4	-6.4	-7.9	-1.8	-12.8
2020 Q3	-4.4	-4.2	-5.1	-1.3	-5.5	-0.6	-8.1	-1.9	-1.6	-2.2	-6.7	0.1	-5.5
Q4	-6.0	-5.4	-8.3	-1.6	-5.3	-2.6	-12.6	-0.4	-1.3	-2.6	-5.5	-0.6	-12.0
2021 Q1	-2.6	-2.8	-1.5	1.9	-1.3	5.1	-10.3	1.9	0.9	3.1	-1.7	2.0	-8.6
Q2	15.6	14.4	21.3	6.9	14.7	24.2	21.9	11.7	6.1	18.6	18.1	8.0	22.8
Hours worked per person employed													
annual percentage changes													
2018	0.1	0.3	0.0	0.3	-0.1	0.5	0.2	0.1	0.1	0.7	0.3	-0.2	0.4
2019	-0.3	-0.2	-0.4	-1.0	-0.6	-0.2	-0.4	0.0	0.3	0.3	-0.1	-0.1	-0.2
2020	-6.0	-5.3	-9.1	-0.6	-5.6	-6.8	-9.6	-3.0	-1.9	-6.3	-5.6	-2.6	-9.8
2020 Q3	-2.4	-2.3	-3.2	0.5	-2.9	-1.4	-3.9	-3.0	-0.9	-3.0	-3.3	-0.6	-2.2
Q4	-4.3	-3.7	-6.9	0.0	-3.0	-3.4	-8.2	-2.0	-0.9	-4.2	-3.4	-1.7	-8.3
2021 Q1	-0.8	-1.0	-0.2	1.5	0.9	3.7	-5.1	-0.4	1.3	1.7	-0.1	0.7	-4.0
Q2	13.4	11.8	21.4	3.1	15.2	18.6	21.4	6.8	5.1	16.2	13.1	5.4	21.0

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 2020			100.0			80.6		19.4		51.4		48.6		
2018	163.438	3.9	13.380	8.2	3.8	10.913	7.3	2.467	17.2	6.879	7.9	6.501	8.6	2.1
2019	164.210	3.6	12.405	7.6	3.3	10.101	6.7	2.304	16.0	6.352	7.2	6.053	7.9	2.2
2020	162.523	3.6	12.742	7.8	3.0	10.265	6.9	2.477	17.7	6.555	7.6	6.188	8.2	1.8
2020 Q3	162.962	3.7	13.840	8.5	3.1	11.131	7.5	2.709	19.2	7.105	8.2	6.735	8.9	1.7
Q4	163.265	3.6	13.089	8.0	3.2	10.615	7.1	2.474	17.8	6.736	7.7	6.353	8.3	1.9
2021 Q1	162.380	3.7	13.542	8.3	3.2	10.895	7.4	2.648	18.6	6.875	7.9	6.667	8.8	2.1
Q2	163.499	3.5	13.154	8.0	3.3	10.520	7.1	2.633	18.0	6.648	7.6	6.505	8.5	2.3
2021 Mar.	-	-	13.101	8.1	-	10.503	7.1	2.598	18.4	6.608	7.6	6.493	8.6	-
Apr.	-	-	13.350	8.2	-	10.663	7.2	2.687	18.8	6.706	7.7	6.643	8.7	-
May	-	-	13.156	8.0	-	10.562	7.1	2.594	18.0	6.638	7.6	6.518	8.5	-
June	-	-	12.712	7.8	-	10.207	6.8	2.505	17.3	6.375	7.3	6.337	8.3	-
July	-	-	12.423	7.6	-	10.043	6.7	2.380	16.7	6.205	7.1	6.218	8.1	-
Aug.	-	-	12.162	7.5	-	9.845	6.6	2.317	16.4	6.138	7.1	6.024	7.9	-

Sources: Eurostat and ECB calculations.

1) Where annual and quarterly Labour Force Survey data have not yet been published, they are estimated as simple averages of the monthly data. There is a break in series from the first quarter of 2021 due to the implementation of the Integrated European Social Statistics Regulation. Owing to technical issues with the introduction of the new German system of integrated household surveys, including the Labour Force Survey, the figures for the euro area include data from Germany, starting in the first quarter of 2020, which are not direct estimates from Labour Force Survey microdata, but based on a larger sample including data from other integrated household surveys.

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. Data are non-seasonally adjusted and cover industry, construction and services (excluding households as employers and extra-territorial organisations and bodies).

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													
2018	0.8	1.1	0.6	1.2	1.5	-1.5	1.7	3.6	1.6	1.4	2.0	0.7	0.9
2019	-1.3	-1.3	-2.4	-1.8	1.4	-2.1	2.1	-3.1	2.4	1.0	3.7	0.8	1.8
2020	-8.6	-9.1	-7.4	-13.2	-4.7	-5.3	-5.7	-9.7	-0.8	3.6	-2.4	-14.4	-25.0
2020 Q4	-1.6	-1.6	1.4	-3.2	-2.6	-1.8	-1.2	-1.0	1.6	4.5	1.3	-13.8	-9.2
2021 Q1	3.5	3.6	4.9	5.1	0.4	0.9	2.9	7.5	2.4	2.7	3.1	-5.1	3.4
Q2	22.5	24.1	25.4	29.0	17.6	7.7	17.8	45.5	11.9	2.1	18.7	29.6	53.8
Q3	.	.	.	.	.	.	.	.	.	.	.	.	-23.5
2021 Apr.	39.8	43.0	38.6	64.2	26.7	13.5	45.5	68.4	23.7	4.1	42.8	62.3	262.5
May	20.5	22.2	24.2	27.0	14.5	6.4	12.2	47.9	8.7	0.4	14.2	28.6	49.5
June	10.6	11.2	15.8	6.8	12.9	3.3	4.1	26.6	5.6	2.0	7.4	11.7	5.4
July	8.0	8.6	11.3	5.9	10.5	1.5	3.5	28.3	3.1	1.2	4.5	3.8	-22.0
Aug.	5.1	6.1	6.6	2.8	10.0	-0.6	-1.6	18.8	0.0	-1.9	1.3	1.2	-24.8
Sep.	.	.	.	.	.	.	.	.	.	.	.	.	-24.2
month-on-month percentage changes (s.a.)													
2021 Apr.	0.7	0.6	0.8	0.7	2.2	1.9	-0.3	3.3	-3.6	-1.6	-5.9	-0.8	-1.5
May	-1.1	-0.7	-0.1	-2.6	-1.6	-2.4	-0.4	-1.4	4.2	-0.6	8.7	8.1	1.8
June	0.2	0.2	0.1	-1.3	2.6	-0.5	-0.7	3.6	1.9	-1.2	3.6	2.2	-0.4
July	1.4	1.6	0.6	2.6	2.1	-0.3	0.1	3.8	-2.6	-0.5	-4.2	0.6	-5.9
Aug.	-1.6	-2.0	-1.5	-3.9	-1.8	0.5	-1.3	-3.8	0.3	-1.7	1.8	-0.1	-3.8
Sep.	.	.	.	.	.	.	.	.	.	.	.	.	3.4

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	99.3	-5.2	80.6	-11.6	-15.4	-8.6	7.3	-	51.2	52.5	53.0	52.8
2018	111.8	6.7	83.7	-4.8	7.2	1.3	15.2	90.4	54.9	54.7	54.5	54.6
2019	103.7	-5.2	82.0	-6.9	6.7	-0.5	10.8	90.5	47.4	47.8	52.7	51.3
2020	88.2	-14.4	74.0	-14.3	-7.4	-12.9	-16.5	86.3	48.6	48.0	42.5	44.0
2020 Q4	91.4	-8.8	76.9	-15.6	-8.3	-10.9	-15.4	85.7	54.6	56.7	45.0	48.1
2021 Q1	95.3	-2.4	80.0	-13.7	-5.9	-16.6	-14.8	85.8	58.4	58.5	46.9	49.9
Q2	114.3	11.7	82.7	-5.5	4.4	0.7	10.5	87.2	63.1	62.7	54.7	56.8
Q3	118.1	14.2	.	-4.6	5.7	3.4	16.9	.	60.9	58.6	58.4	58.4
2021 May	114.5	11.5	-	-5.1	4.9	0.5	11.3	-	63.1	62.2	55.2	57.1
June	117.9	12.8	-	-3.3	5.2	4.7	17.9	-	63.4	62.6	58.3	59.5
July	119.0	14.5	82.9	-4.4	4.0	4.4	18.9	88.0	62.8	61.1	59.8	60.2
Aug.	117.6	13.8	-	-5.3	5.5	4.6	16.8	-	61.4	59.0	59.0	59.0
Sep.	117.8	14.1	-	-4.0	7.5	1.3	15.1	-	58.6	55.6	56.4	56.2
Oct.	.	.	-	-4.8	.	.	.	-	58.5	53.2	54.7	54.3

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
2018	12.6	93.3	1.9	2.0	6.3	2.5	4.6	35.5	5.6	76.5	2.0	7.6	1.6
2019	13.1	93.6	1.8	2.6	3.8	5.7	3.9	35.3	6.3	75.9	2.1	7.9	1.7
2020	19.5	96.4	-0.5	4.1	-3.5	5.1	4.7	31.3	4.5	83.1	3.3	-14.8	2.0
2020 Q3	17.8	95.6	0.7	3.6	-1.6	3.6	4.2	31.5	4.4	82.8	2.7	-15.2	1.9
Q4	19.5	96.4	0.3	4.1	2.6	5.1	4.7	31.3	4.5	83.1	3.3	-21.3	2.0
2021 Q1	20.6	96.7	-0.2	4.8	10.3	7.4	4.6	32.3	5.8	84.5	3.9	-10.7	2.2
Q2	19.1	96.7	3.4	4.2	29.8	6.5	4.8	34.2	7.9	81.7	4.3	20.6	2.2

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
2020 Q3	958.7	884.9	73.8	548.0	455.5	198.2	188.6	184.0	177.9	28.5	62.9	12.2	10.4
Q4	1,021.2	930.4	90.8	581.6	479.6	225.5	197.6	183.3	173.9	30.7	79.3	23.8	24.6
2021 Q1	1,050.8	945.3	105.5	602.3	496.9	226.5	203.5	191.2	169.0	30.8	75.8	15.4	12.4
Q2	1,073.5	1,007.8	65.6	617.7	536.1	232.5	212.4	193.8	188.1	29.4	71.2	17.2	11.6
2021 Mar.	348.0	324.1	23.9	201.7	175.3	75.2	70.4	60.7	54.8	10.4	23.6	7.4	4.7
Apr.	354.3	336.7	17.6	203.2	176.6	77.1	71.5	63.4	64.9	10.7	23.7	4.6	3.6
May	360.3	342.1	18.2	208.5	180.6	77.0	72.0	65.7	65.6	9.0	23.9	5.3	3.0
June	358.9	329.0	29.9	206.1	178.9	78.4	68.8	64.7	57.7	9.7	23.6	7.3	4.9
July	357.2	334.6	22.6	208.9	183.1	79.1	72.4	59.1	55.2	10.1	23.8	6.6	4.8
Aug.	359.2	345.8	13.4	204.9	187.4	79.9	80.6	57.8	53.1	16.7	24.7	7.1	2.7
12-month cumulated transactions													
2021 Aug.	4,190.2	3,862.1	328.1	2,402.9	2,038.0	913.9	830.4	746.4	697.2	127.1	296.6	74.0	60.0
12-month cumulated transactions as a percentage of GDP													
2021 Aug.	35.5	32.8	2.8	20.4	17.3	7.8	7.0	6.3	5.9	1.1	2.5	0.6	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)													
2020 Q3	-8.6	-11.4	531.9	248.2	108.4	166.0	448.4	469.6	242.5	85.0	134.3	360.7	34.2
Q4	-2.7	-5.7	568.7	265.5	114.2	178.4	480.2	493.1	261.9	86.8	135.2	380.1	35.4
2021 Q1	0.6	0.3	582.0	280.5	114.9	174.6	487.5	512.7	285.1	91.3	129.8	383.0	47.1
Q2	34.3	33.6	595.3	290.6	116.8	176.2	492.2	556.8	322.2	91.7	134.9	403.4	53.5
2021 Mar.	12.5	19.2	197.8	95.7	38.4	59.4	161.9	179.7	101.6	32.0	45.2	132.4	17.1
Apr.	46.8	38.1	198.1	95.2	39.6	60.0	164.6	184.9	106.3	30.6	45.7	133.5	17.1
May	35.0	35.0	199.3	97.5	39.0	58.8	164.6	185.8	107.7	30.7	44.6	135.2	18.3
June	23.7	28.4	197.9	98.0	38.3	57.4	163.1	186.1	108.3	30.4	44.6	134.7	18.2
July	11.5	17.2	200.0	98.5	40.3	56.9	165.7	186.5	110.4	30.0	43.1	133.3	19.4
Aug.	18.2	26.5	200.6	.	.	.	164.0	189.4	.	.	.	136.4	.
Volume indices (2000 = 100; annual percentage changes for columns 1 and 2)													
2020 Q3	-7.2	-6.8	98.6	100.0	95.6	100.1	97.9	101.8	96.9	106.2	110.8	104.5	81.2
Q4	-1.4	-0.9	104.3	105.9	99.6	106.5	103.8	105.6	102.7	107.8	111.1	109.3	84.9
2021 Q1	0.7	0.2	104.5	108.5	100.7	101.8	103.9	104.9	103.4	112.3	105.4	108.2	85.6
Q2	29.2	20.3	104.5	108.8	101.7	101.1	103.1	109.4	109.8	113.1	107.6	111.6	84.9
2021 Feb.	-2.0	-3.5	104.1	107.6	103.4	100.6	104.8	103.7	101.8	110.7	104.1	107.5	85.2
Mar.	11.4	15.4	105.7	110.5	100.2	102.4	103.0	108.4	107.8	118.5	109.1	111.5	84.5
Apr.	41.7	25.2	104.6	107.6	103.9	102.8	103.6	109.9	110.6	112.7	109.0	111.0	83.9
May	29.4	20.5	104.7	109.2	101.0	101.3	103.2	109.7	110.5	113.4	106.9	112.5	87.2
June	19.0	15.7	104.1	109.6	100.1	99.3	102.5	108.7	108.5	113.2	106.9	111.4	83.5
July	4.3	2.4	103.4	108.1	103.8	96.4	102.3	105.7	106.9	108.0	101.7	107.7	85.1

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 2021	100.0	100.0	68.7	58.2	41.8	100.0	16.7	5.1	26.9	9.5	41.8	86.7	13.3
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
2020	105.1	0.3	0.7	-0.4	1.0	-	-	-	-	-	-	0.2	0.6
2020 Q4	105.0	-0.3	0.2	-0.9	0.5	0.0	0.1	0.8	-0.7	0.5	0.3	-0.4	0.5
2021 Q1	105.8	1.1	1.2	0.8	1.3	1.3	0.6	-0.3	1.5	6.5	0.6	1.0	1.4
Q2	107.4	1.8	0.9	2.5	0.9	0.5	0.4	1.4	-0.3	3.7	0.3	1.8	2.4
Q3	108.0	2.8	1.4	4.1	1.2	1.1	0.6	0.6	1.3	4.3	0.5	2.7	3.5
2021 Apr.	107.1	1.6	0.7	2.1	0.9	0.2	0.2	1.4	0.0	0.7	0.0	1.5	2.2
May	107.4	2.0	1.0	2.6	1.1	0.2	0.1	-0.2	0.1	0.8	0.1	1.9	2.4
June	107.7	1.9	0.9	2.8	0.7	0.3	0.2	-0.2	0.3	1.3	0.2	1.8	2.5
July	107.6	2.2	0.7	3.3	0.9	0.6	0.3	0.3	1.1	2.0	0.0	2.0	3.5
Aug.	108.0	3.0	1.6	4.5	1.1	0.3	0.2	0.6	0.2	1.0	0.2	2.9	3.5
Sep.	108.5	3.4	1.9	4.6	1.7	0.2	0.2	0.2	-0.5	1.4	0.4	3.3	3.6

	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 2021	21.8	16.7	5.1	36.4	26.9	9.5	12.2	7.5	6.5	2.7	11.4	9.0
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
2020	2.3	1.8	4.0	-1.8	0.2	-6.8	1.4	1.3	0.5	-0.6	1.0	1.4
2020 Q4	1.7	1.2	3.5	-2.4	-0.3	-7.8	1.2	1.2	-0.6	-1.5	0.6	1.3
2021 Q1	1.3	1.2	1.7	0.5	0.9	-0.6	1.3	1.2	1.1	-0.4	1.4	1.5
Q2	0.6	0.8	-0.2	3.6	0.8	12.0	1.4	1.3	0.8	-0.1	0.5	1.6
Q3	1.9	1.7	2.5	5.4	1.8	15.8	1.4	1.1	2.4	0.7	1.1	1.6
2021 Apr.	0.6	0.9	-0.3	3.0	0.4	10.4	1.4	1.3	0.5	0.1	0.6	1.4
May	0.5	0.7	0.0	3.8	0.7	13.1	1.4	1.3	1.2	-0.1	0.8	1.6
June	0.5	0.8	-0.3	4.1	1.2	12.6	1.4	1.3	0.7	-0.1	0.1	1.7
July	1.6	1.5	1.9	4.3	0.7	14.3	1.4	1.1	1.7	0.7	0.3	1.7
Aug.	2.0	1.7	3.0	6.0	2.6	15.4	1.4	1.1	2.3	0.7	1.0	1.6
Sep.	2.0	1.9	2.6	6.1	2.1	17.6	1.5	1.2	3.3	0.6	1.9	1.5

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).

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			
2018	104.1	3.3	2.4	1.5	2.7	1.0	0.4	0.1	0.6	8.4	2.5	4.9	4.1
2019	104.7	0.6	0.6	0.8	0.1	1.5	1.0	1.1	0.9	-0.1	1.9	4.2	4.5
2020	102.0	-2.6	-1.7	-0.1	-1.6	0.9	1.0	1.1	0.6	-9.7	1.3	5.4	1.7
2020 Q3	101.4	-2.7	-2.0	-0.3	-1.8	0.8	0.5	0.3	0.6	-9.3	1.0	5.3	1.1
Q4	102.6	-1.7	-1.7	0.0	-0.6	0.8	0.0	-0.5	0.7	-6.7	1.6	6.0	-0.9
2021 Q1	105.9	2.1	1.3	1.4	2.7	1.0	0.0	-0.7	0.7	3.8	2.7	6.1	.
Q2	109.4	9.2	6.8	4.7	9.0	1.7	1.8	1.8	1.2	23.7	4.5	7.2	.
2021 Mar.	106.9	4.4	3.5	2.4	4.5	1.2	0.5	-0.1	0.9	10.3	-	-	-
Apr.	107.9	7.6	5.8	3.6	7.0	1.4	1.0	0.8	1.1	20.6	-	-	-
May	109.3	9.6	7.2	4.9	9.3	1.8	2.0	1.9	1.3	25.1	-	-	-
June	110.9	10.3	7.4	5.6	10.7	2.0	2.4	2.6	1.4	25.5	-	-	-
July	113.7	12.4	8.4	6.8	12.7	2.5	2.7	2.8	2.0	30.1	-	-	-
Aug.	114.9	13.4	9.2	7.4	14.2	3.1	2.9	2.9	2.2	32.0	-	-	-

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
2018	103.6	1.5	1.8	1.5	1.9	1.9	1.5	2.2	60.4	-0.9	-6.3	4.3	-0.6	-6.2	5.7
2019	105.3	1.7	1.5	1.1	1.8	2.3	0.8	0.3	57.2	2.0	4.4	-0.1	3.0	8.3	-2.3
2020	107.1	1.6	1.1	0.5	3.5	1.2	-1.3	-2.6	37.0	1.5	3.4	-0.3	-0.9	-0.1	-1.8
2020 Q4	107.4	1.2	0.9	0.0	2.8	0.4	-1.4	-2.6	37.4	4.1	0.1	7.9	-0.5	-6.1	6.2
2021 Q1	108.2	1.6	1.6	1.0	2.4	1.1	0.9	0.8	50.4	18.3	9.1	27.3	14.0	5.1	24.6
Q2	108.2	0.5	1.5	1.5	-1.4	2.2	4.2	7.0	57.0	38.3	20.1	56.4	35.6	20.2	54.4
Q3	.	.	.	.	.	.	.	.	61.9	31.1	26.3	35.4	32.4	28.3	36.7
2021 Apr.	-	-	-	-	-	-	-	-	54.1	35.4	17.5	54.0	33.8	19.4	51.4
May	-	-	-	-	-	-	-	-	56.0	41.1	20.7	61.9	37.2	19.2	59.5
June	-	-	-	-	-	-	-	-	60.7	38.2	22.2	53.4	35.9	21.9	52.1
July	-	-	-	-	-	-	-	-	62.9	36.9	26.8	46.0	36.1	27.4	45.5
Aug.	-	-	-	-	-	-	-	-	59.5	30.0	29.1	30.7	31.7	31.6	31.8
Sep.	-	-	-	-	-	-	-	-	63.4	26.7	23.1	29.9	29.3	25.9	33.0

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

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

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

4 Prices and costs

4.4 Price-related opinion surveys
(seasonally adjusted)

	European Commission Business and Consumer Surveys (percentage balances)					Purchasing Managers' Surveys (diffusion indices)			
	Selling price expectations (for next three months)				Consumer price trends over past 12 months	Input prices		Prices charged	
	Manu-facturing	Retail trade	Services	Construction		Manu-facturing	Services	Manu-facturing	Services
	1	2	3	4	5	6	7	8	9
1999-15	4.3	5.6	-	-4.5	32.3	56.7	56.3	-	49.7
2018	11.5	7.5	9.6	12.6	20.6	65.4	57.9	56.1	52.7
2019	4.2	7.3	9.1	7.5	18.2	48.8	57.1	50.4	52.4
2020	-1.3	1.6	-0.8	-5.8	10.9	49.0	52.1	48.7	47.2
2020 Q4	1.6	2.6	-2.7	-7.8	7.0	56.7	52.6	51.6	48.3
2021 Q1	10.7	5.0	-1.8	-3.8	8.1	74.0	54.0	56.5	48.6
Q2	30.0	18.2	8.5	15.7	20.4	85.9	60.1	68.2	53.1
Q3	36.9	28.0	12.3	26.1	35.0	87.7	63.8	70.3	55.1
2021 May	29.9	17.5	9.4	16.7	19.2	87.1	59.6	69.1	52.6
June	36.0	23.1	10.9	21.9	24.7	88.5	63.2	71.1	55.6
July	35.5	26.1	12.2	25.7	31.2	89.2	63.1	71.9	55.4
Aug.	37.2	27.3	11.7	27.8	34.4	87.0	63.3	68.6	54.7
Sep.	38.2	30.5	13.1	24.8	39.3	86.9	65.2	70.4	55.1
Oct.	.	.	.	.	.	90.2	67.0	72.3	56.1

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

4.5 Labour cost indices
(annual percentage changes, unless otherwise indicated)

	Total (index: 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	
2018	104.4	2.5	2.3	3.2	2.6	2.3	2.0
2019	106.9	2.4	2.6	2.1	2.4	2.5	2.2
2020	110.2	3.1	3.7	1.2	2.7	3.8	1.8
2020 Q3	105.0	1.5	2.2	-0.4	1.3	2.1	1.7
Q4	116.6	2.9	3.4	0.7	2.2	4.2	2.0
2021 Q1	104.6	1.3	2.0	-1.0	1.2	1.9	1.4
Q2	115.8	-0.2	-0.4	0.8	-0.9	1.6	1.7

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												
2018	103.4	1.9	1.3	1.5	2.6	2.1	0.1	1.1	4.0	1.6	2.6	2.0
2019	105.3	1.9	-1.0	2.0	1.9	0.8	0.9	1.8	2.6	2.5	2.6	2.1
2020	110.1	4.5	-1.2	2.8	4.7	6.5	0.7	0.3	1.6	5.6	6.3	13.6
2020 Q3	108.6	2.9	-1.3	1.0	6.1	4.7	-1.5	-0.7	3.7	5.1	3.1	10.0
Q4	109.9	3.7	-0.5	-1.0	3.1	5.6	1.8	1.2	5.0	4.8	6.1	22.1
2021 Q1	110.3	1.5	3.2	-3.1	5.0	2.0	0.5	1.2	4.5	2.5	2.8	15.4
Q2	108.9	-4.2	6.7	-10.5	-1.3	-7.4	0.6	-2.7	8.6	-1.9	-4.7	-2.5
Compensation per employee												
2018	105.2	2.1	1.0	1.8	2.2	2.0	2.6	2.3	2.9	2.7	1.9	3.0
2019	107.4	2.1	3.1	1.4	1.4	1.6	3.3	2.2	2.4	2.8	2.3	3.3
2020	106.7	-0.6	0.5	-2.3	-1.6	-4.6	0.4	-0.2	0.9	-0.3	2.4	-2.6
2020 Q3	108.6	0.7	0.3	-1.4	1.6	-1.3	0.4	-0.3	2.8	1.1	2.4	0.5
Q4	109.1	1.0	0.2	0.0	1.6	-3.3	1.4	0.7	2.5	1.1	3.4	-0.5
2021 Q1	109.3	2.1	1.9	2.2	4.1	-0.9	2.0	3.1	3.0	1.6	2.3	1.2
Q2	109.5	7.3	2.1	9.3	10.7	13.2	7.3	0.7	10.2	8.4	2.2	11.1
Labour productivity per person employed												
2018	101.7	0.2	-0.3	0.3	-0.4	-0.2	2.5	1.2	-1.0	1.1	-0.7	1.0
2019	102.0	0.3	4.2	-0.6	-0.5	0.8	2.3	0.3	-0.2	0.2	-0.3	1.2
2020	97.0	-4.9	1.7	-5.0	-6.0	-10.5	-0.3	-0.5	-0.7	-5.6	-3.7	-14.3
2020 Q3	100.0	-2.1	1.7	-2.4	-4.2	-5.7	1.9	0.4	-0.9	-3.8	-0.7	-8.6
Q4	99.3	-2.7	0.8	1.1	-1.5	-8.5	-0.4	-0.4	-2.4	-3.6	-2.6	-18.5
2021 Q1	99.1	0.5	-1.3	5.4	-0.9	-2.8	1.5	1.9	-1.5	-0.9	-0.5	-12.4
Q2	100.5	12.0	-4.3	22.1	12.2	22.3	6.7	3.5	1.5	10.5	7.2	14.0
Compensation per hour worked												
2018	104.9	1.9	1.4	1.8	1.5	1.4	2.4	2.3	2.0	2.2	2.2	2.4
2019	107.4	2.3	3.7	1.9	1.7	2.0	3.1	1.8	2.1	2.8	2.4	3.7
2020	112.6	4.9	2.3	3.1	4.0	5.0	2.6	1.1	5.4	4.5	4.7	6.1
2020 Q3	110.9	3.0	-0.1	1.5	2.8	2.9	2.9	0.2	5.3	4.2	2.8	2.8
Q4	113.3	4.8	1.4	2.9	3.9	5.1	2.4	1.2	6.3	3.7	4.8	6.5
2021 Q1	114.0	3.1	0.7	1.2	0.8	5.0	2.5	1.8	3.4	2.1	1.7	4.6
Q2	112.5	-4.0	-2.4	-4.3	-5.6	-5.3	1.2	-3.6	0.6	-2.6	-2.4	-4.6
Hourly labour productivity												
2018	101.9	0.1	-0.5	0.4	-0.9	-0.4	2.4	1.1	-1.7	0.8	-0.5	0.6
2019	102.5	0.6	5.2	0.0	-0.3	1.2	2.3	0.1	-0.5	0.3	-0.2	1.4
2020	103.7	1.1	2.4	0.6	0.8	-0.9	2.8	1.4	6.0	0.0	-1.1	-5.0
2020 Q3	102.9	0.3	1.1	0.6	-2.8	-1.9	5.0	1.3	2.2	-0.5	-0.1	-6.5
Q4	104.3	1.7	0.8	4.2	2.0	-0.3	1.6	0.5	1.9	-0.2	-0.9	-11.2
2021 Q1	104.3	1.4	-2.8	4.5	-4.4	2.4	1.9	0.6	-3.1	-0.8	-1.2	-8.7
Q2	104.1	-1.2	-7.2	6.0	-5.4	0.7	-0.2	-1.5	-12.7	-2.3	1.7	-5.7

Sources: Eurostat and ECB calculations.

5 Money and credit

5.1 Monetary aggregates [1)]

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

	M3											
	M2							M3-M2				
	M1			M2-M1								
	Currency in circulation	Overnight deposits		Deposits with an agreed maturity of up to 2 years	Deposits redeemable at notice of up to 3 months			Repos	Money market fund shares	Debt securities with a maturity of up to 2 years		
	1	2	3	4	5	6	7	8	9	10	11	12
Outstanding amounts												
2018	1,164.2	7,114.7	8,278.9	1,128.3	2,298.9	3,427.2	11,706.1	74.4	521.8	82.0	678.2	12,384.3
2019	1,221.5	7,726.9	8,948.4	1,073.1	2,362.4	3,435.5	12,383.9	78.7	529.1	19.4	627.1	13,011.0
2020	1,359.2	8,898.4	10,257.6	1,039.9	2,447.3	3,487.2	13,744.9	100.6	647.0	28.4	776.0	14,520.9
2020 Q4	1,359.2	8,898.4	10,257.6	1,039.9	2,447.3	3,487.2	13,744.9	100.6	647.0	28.4	776.0	14,520.9
2021 Q1	1,391.8	9,147.2	10,539.0	985.6	2,483.8	3,469.5	14,008.5	109.6	612.4	12.6	734.6	14,743.0
Q2	1,419.5	9,360.8	10,780.3	932.4	2,489.8	3,422.3	14,202.6	112.0	608.6	22.1	742.7	14,945.2
Q3 [p]	1,443.7	9,606.2	11,049.9	916.3	2,490.0	3,406.3	14,456.2	121.1	600.8	32.3	754.3	15,210.5
2021 Apr.	1,402.4	9,182.3	10,584.7	965.6	2,486.4	3,452.0	14,036.7	109.3	608.7	20.3	738.3	14,774.9
May	1,411.7	9,241.0	10,652.6	964.3	2,486.3	3,450.5	14,103.2	107.2	609.7	28.4	745.4	14,848.5
June	1,419.5	9,360.8	10,780.3	932.4	2,489.8	3,422.3	14,202.6	112.0	608.6	22.1	742.7	14,945.2
July	1,426.8	9,418.4	10,845.3	934.9	2,487.3	3,422.2	14,267.5	116.8	612.6	30.4	759.8	15,027.3
Aug.	1,435.6	9,509.1	10,944.7	918.0	2,484.1	3,402.1	14,346.8	110.7	615.7	29.5	755.9	15,102.7
Sep. [p]	1,443.7	9,606.2	11,049.9	916.3	2,490.0	3,406.3	14,456.2	121.1	600.8	32.3	754.3	15,210.5
Transactions												
2018	50.6	468.0	518.6	-73.2	44.8	-28.5	490.1	-0.9	12.6	-0.9	10.8	500.9
2019	57.3	605.8	663.2	-59.7	61.5	1.8	664.9	4.1	-2.1	-56.6	-54.6	610.3
2020	137.6	1,255.9	1,393.5	-27.2	85.7	58.5	1,452.0	19.2	124.0	8.8	152.0	1,604.0
2020 Q4	28.6	296.1	324.7	-35.0	24.0	-10.9	313.8	-3.5	41.3	27.6	65.4	379.2
2021 Q1	32.6	236.2	268.9	-57.9	38.0	-19.9	249.0	8.0	-34.6	-14.2	-40.8	208.1
Q2	27.7	218.0	245.7	-52.1	6.1	-46.0	199.7	2.7	-3.1	9.4	9.0	208.7
Q3 [p]	24.5	229.5	254.0	-17.5	8.1	-9.4	244.6	6.1	-7.8	9.1	7.4	251.9
2021 Apr.	10.6	44.4	54.9	-17.6	2.6	-15.0	40.0	0.4	-3.7	7.7	4.4	44.4
May	9.3	60.9	70.2	-0.7	-0.1	-0.8	69.4	-1.9	1.6	8.5	8.3	77.7
June	7.8	112.7	120.5	-33.8	3.6	-30.2	90.3	4.2	-1.1	-6.8	-3.7	86.6
July	7.6	56.8	64.4	2.7	-2.5	0.2	64.6	4.8	4.0	8.4	17.2	81.8
Aug.	8.8	81.2	90.0	-17.1	4.7	-12.5	77.5	-6.2	3.1	-1.3	-4.4	73.2
Sep. [p]	8.1	91.5	99.6	-3.0	5.8	2.8	102.4	7.4	-14.9	2.1	-5.5	96.9
Growth rates												
2018	4.5	7.0	6.7	-6.1	2.0	-0.8	4.4	-1.3	2.5	-	1.6	4.2
2019	4.9	8.5	8.0	-5.3	2.7	0.1	5.7	5.4	-0.4	-	-8.0	4.9
2020	11.3	16.3	15.6	-2.5	3.6	1.7	11.7	24.2	23.5	-	24.2	12.3
2020 Q4	11.3	16.3	15.6	-2.5	3.6	1.7	11.7	24.2	23.5	-	24.2	12.3
2021 Q1	10.0	14.2	13.7	-8.0	5.0	0.9	10.2	-3.6	14.9	-	6.3	10.0
Q2	9.0	12.2	11.8	-13.0	3.8	-1.4	8.3	13.5	5.7	-	8.3	8.3
Q3 [p]	8.5	11.4	11.0	-15.1	3.1	-2.5	7.5	12.6	-0.8	-	5.7	7.4
2021 Apr.	9.8	12.8	12.4	-9.2	4.6	0.3	9.1	13.6	11.7	-	10.1	9.2
May	9.1	12.0	11.6	-11.5	4.1	-0.8	8.3	8.9	10.1	-	11.0	8.5
June	9.0	12.2	11.8	-13.0	3.8	-1.4	8.3	13.5	5.7	-	8.3	8.3
July	8.9	11.3	11.0	-13.5	3.4	-1.8	7.6	5.1	4.0	-	7.9	7.6
Aug.	8.6	11.4	11.0	-12.5	3.3	-1.5	7.8	15.1	5.0	-	10.0	7.9
Sep. [p]	8.5	11.4	11.0	-15.1	3.1	-2.5	7.5	12.6	-0.8	-	5.7	7.4

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													
2018	2,334.0	1,901.2	277.3	147.9	7.6	6,645.3	4,035.6	517.8	2,090.6	1.3	996.1	204.8	436.2
2019	2,482.3	2,068.7	256.9	150.2	6.5	7,041.2	4,397.1	492.3	2,151.0	0.8	1,032.6	217.1	468.0
2020	2,985.3	2,528.6	310.3	143.1	3.3	7,647.5	4,954.5	437.5	2,254.7	0.8	1,106.7	237.9	508.9
2020 Q4	2,985.3	2,528.6	310.3	143.1	3.3	7,647.5	4,954.5	437.5	2,254.7	0.8	1,106.7	237.9	508.9
2021 Q1	3,071.4	2,618.4	301.3	143.8	7.8	7,825.3	5,109.5	422.2	2,292.9	0.8	1,127.9	209.4	492.3
Q2	3,105.4	2,667.0	290.0	139.7	8.7	7,908.1	5,199.4	407.5	2,300.4	0.7	1,171.3	219.4	490.9
Q3 [p]	3,164.1	2,739.0	284.5	131.1	9.5	8,015.7	5,311.6	389.8	2,313.6	0.7	1,218.5	227.5	507.9
2021 Apr.	3,051.4	2,606.1	294.9	143.0	7.4	7,844.1	5,129.7	417.6	2,295.9	0.9	1,128.7	225.5	493.8
May	3,059.6	2,615.9	295.2	141.7	6.8	7,874.6	5,165.7	411.6	2,296.5	0.8	1,144.4	229.4	490.7
June	3,105.4	2,667.0	290.0	139.7	8.7	7,908.1	5,199.4	407.5	2,300.4	0.7	1,171.3	219.4	490.9
July	3,109.3	2,681.5	284.3	135.8	7.7	7,939.3	5,234.4	398.9	2,305.2	0.8	1,183.1	232.0	493.9
Aug.	3,133.4	2,712.7	281.7	130.6	8.5	7,989.5	5,286.6	394.2	2,307.9	0.8	1,174.9	229.9	494.2
Sep. [p]	3,164.1	2,739.0	284.5	131.1	9.5	8,015.7	5,311.6	389.8	2,313.6	0.7	1,218.5	227.5	507.9
Transactions													
2018	94.6	106.8	-9.7	-1.0	-1.4	326.6	325.4	-45.0	45.6	0.5	1.7	-3.6	19.2
2019	149.6	167.1	-18.9	1.7	-0.4	394.5	360.2	-26.2	61.0	-0.5	26.9	11.0	29.7
2020	514.0	468.0	55.8	-6.9	-3.0	611.6	561.1	-53.8	104.4	-0.1	144.6	22.3	41.1
2020 Q4	32.1	51.9	-12.5	-3.7	-3.5	158.4	139.1	-8.5	27.9	-0.2	53.9	-1.9	39.2
2021 Q1	81.1	85.0	-9.0	0.6	4.4	176.4	152.6	-16.0	39.7	0.0	12.5	-29.1	-16.5
Q2	36.3	50.5	-11.1	-4.0	0.9	83.6	90.5	-14.5	7.6	-0.1	46.0	10.1	-1.3
Q3 [p]	59.5	65.6	-6.0	-0.8	0.7	100.1	106.1	-17.8	12.0	-0.1	44.6	5.3	16.6
2021 Apr.	-15.4	-8.7	-5.7	-0.7	-0.3	20.3	21.3	-4.3	3.1	0.1	6.6	16.5	1.7
May	9.4	10.8	0.7	-1.4	-0.6	30.9	36.3	-5.9	0.6	-0.2	17.2	4.0	-3.2
June	42.3	48.5	-6.1	-1.8	1.8	32.3	32.9	-4.4	3.9	0.0	22.2	-10.4	0.2
July	11.5	18.8	-5.6	-0.7	-1.0	22.9	29.9	-8.7	1.5	0.1	12.0	12.5	2.9
Aug.	22.6	25.0	-2.8	-0.4	0.8	50.9	50.9	-4.7	4.7	-0.1	-9.2	-2.1	0.4
Sep. [p]	25.4	21.8	2.4	0.4	0.9	26.4	25.2	-4.5	5.7	-0.1	41.7	-5.1	13.3
Growth rates													
2018	4.2	5.9	-3.4	-0.7	-16.2	5.2	8.8	-8.0	2.2	66.7	0.2	-1.7	4.6
2019	6.4	8.8	-6.8	1.2	-6.8	5.9	8.9	-5.1	2.9	-36.8	2.7	5.3	6.8
2020	20.7	22.6	21.6	-4.6	-46.9	8.7	12.8	-10.9	4.9	-6.5	14.5	10.3	8.8
2020 Q4	20.7	22.6	21.6	-4.6	-46.9	8.7	12.8	-10.9	4.9	-6.5	14.5	10.3	8.8
2021 Q1	18.0	19.8	15.2	-2.7	9.4	9.2	12.7	-10.4	6.0	39.5	4.1	-6.2	4.2
Q2	8.5	11.5	-8.3	-5.7	47.9	7.7	11.0	-11.8	4.6	-20.0	15.5	-2.8	5.4
Q3 [p]	7.1	10.2	-12.0	-5.3	38.5	6.9	10.1	-12.7	3.9	-31.8	14.9	-6.5	8.1
2021 Apr.	12.8	14.8	4.7	-2.7	26.2	8.3	11.6	-10.4	5.4	4.0	8.8	-0.5	6.0
May	8.9	11.6	-5.8	-3.9	47.4	7.9	11.3	-11.3	4.9	-13.7	11.5	-0.7	6.5
June	8.5	11.5	-8.3	-5.7	47.9	7.7	11.0	-11.8	4.6	-20.0	15.5	-2.8	5.4
July	6.8	10.4	-14.2	-5.5	46.9	7.3	10.6	-12.6	4.2	-27.9	14.9	-3.9	4.1
Aug.	6.9	10.2	-13.0	-5.6	96.7	7.3	10.7	-12.6	4.1	-27.7	16.4	-1.7	5.7
Sep. [p]	7.1	10.2	-12.0	-5.3	38.5	6.9	10.1	-12.7	3.9	-31.8	14.9	-6.5	8.1

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								
	Total	Loans	Debt securities	Total	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		
						Adjusted loans [2)]						
	1	2	3	4	5	6	7	8	9	10	11	12
Outstanding amounts												
2018	4,684.1	1,008.4	3,664.3	13,416.5	11,123.0	11,483.4	4,404.9	5,741.9	849.8	126.4	1,519.9	773.6
2019	4,660.7	986.8	3,662.2	13,865.5	11,452.4	11,839.6	4,475.8	5,931.1	893.5	152.0	1,562.5	850.6
2020	5,925.4	996.1	4,917.3	14,343.2	11,927.3	12,301.1	4,723.6	6,119.9	916.1	167.7	1,549.9	866.0
2020 Q4	5,925.4	996.1	4,917.3	14,343.2	11,927.3	12,301.1	4,723.6	6,119.9	916.1	167.7	1,549.9	866.0
2021 Q1	6,092.3	993.9	5,096.8	14,461.3	12,059.3	12,419.4	4,782.9	6,173.4	947.8	155.3	1,521.2	880.8
Q2	6,185.9	1,005.9	5,178.4	14,485.7	12,073.0	12,436.6	4,745.5	6,240.3	937.6	149.7	1,523.8	888.9
Q3 [p)]	6,365.7	997.9	5,366.2	14,609.3	12,179.8	12,532.7	4,773.2	6,310.1	952.1	144.4	1,533.4	896.1
2021 Apr.	6,098.6	1,002.7	5,093.7	14,417.3	12,037.9	12,393.8	4,751.5	6,191.4	944.6	150.4	1,505.5	873.8
May	6,133.9	1,004.4	5,127.7	14,455.7	12,064.9	12,415.5	4,745.8	6,213.7	948.3	157.1	1,505.0	885.8
June	6,185.9	1,005.9	5,178.4	14,485.7	12,073.0	12,436.6	4,745.5	6,240.3	937.6	149.7	1,523.8	888.9
July	6,290.8	1,009.9	5,279.2	14,530.3	12,113.7	12,474.1	4,745.6	6,274.6	945.5	148.0	1,527.4	889.2
Aug.	6,341.8	1,005.1	5,335.1	14,550.1	12,131.4	12,487.4	4,754.0	6,291.2	939.1	147.1	1,521.6	897.0
Sep. [p)]	6,365.7	997.9	5,366.2	14,609.3	12,179.8	12,532.7	4,773.2	6,310.1	952.1	144.4	1,533.4	896.1
Transactions												
2018	91.5	-28.2	119.7	375.0	307.5	382.6	124.1	166.1	-0.3	17.7	88.5	-21.1
2019	-87.2	-23.3	-64.3	452.1	378.3	424.9	115.6	200.4	41.2	21.1	30.5	43.4
2020	1,050.4	13.3	1,037.0	735.1	539.6	560.6	288.8	209.2	25.8	15.8	167.2	28.3
2020 Q4	177.0	-1.9	178.7	156.7	83.6	119.9	3.5	60.8	9.6	9.7	30.0	43.1
2021 Q1	162.2	-1.7	174.4	144.4	132.5	114.8	59.6	56.6	28.9	-12.6	3.7	8.2
Q2	109.8	11.9	97.2	47.2	38.5	38.4	-25.8	78.9	-9.2	-5.5	2.7	6.0
Q3 [p)]	182.6	-8.2	190.8	132.1	119.4	121.5	39.4	64.1	23.8	-7.8	10.1	2.6
2021 Apr.	25.3	8.5	16.1	-20.6	-0.7	-8.8	-22.8	27.6	-0.7	-4.7	-12.6	-7.3
May	37.6	1.8	35.7	40.6	30.6	23.0	-3.9	23.0	4.8	6.7	-0.4	10.4
June	47.0	1.6	45.5	27.2	8.6	24.3	1.0	28.3	-13.2	-7.4	15.7	3.0
July	79.3	4.0	75.3	46.1	46.2	46.1	13.5	26.0	8.4	-1.8	3.0	-3.1
Aug.	60.0	-5.0	65.0	26.5	25.7	23.3	7.2	17.2	2.3	-0.9	-4.9	5.6
Sep. [p)]	43.3	-7.2	50.6	59.6	47.6	52.1	18.7	20.9	13.1	-5.2	12.0	0.0
Growth rates												
2018	2.0	-2.7	3.4	2.9	2.8	3.4	2.9	3.0	0.0	16.3	6.1	-2.6
2019	-1.9	-2.3	-1.8	3.4	3.4	3.7	2.6	3.5	4.8	16.1	2.0	5.5
2020	22.3	1.3	27.9	5.3	4.7	4.7	6.5	3.5	2.9	10.4	11.2	3.4
2020 Q4	22.3	1.3	27.9	5.3	4.7	4.7	6.5	3.5	2.9	10.4	11.2	3.4
2021 Q1	21.9	-0.8	28.1	4.6	3.6	3.5	4.6	3.8	-1.4	-3.5	10.0	8.4
Q2	13.1	0.6	16.2	3.6	3.1	3.0	1.4	4.5	3.3	-3.5	5.1	7.6
Q3 [p)]	11.0	0.0	13.6	3.4	3.2	3.2	1.6	4.3	5.9	-10.3	3.1	7.3
2021 Apr.	18.0	-0.5	22.9	4.0	3.3	3.2	2.6	4.3	0.8	-3.5	6.5	9.0
May	15.4	-0.2	19.4	3.5	2.8	2.7	1.5	4.3	0.6	1.8	5.1	9.6
June	13.1	0.6	16.2	3.6	3.1	3.0	1.4	4.5	3.3	-3.5	5.1	7.6
July	12.4	1.1	15.1	3.4	3.1	3.0	1.3	4.5	4.2	-5.0	4.4	6.9
Aug.	12.1	1.0	14.8	3.2	3.0	3.0	1.0	4.5	5.1	-6.0	2.6	7.2
Sep. [p)]	11.0	0.0	13.6	3.4	3.2	3.2	1.6	4.3	5.9	-10.3	3.1	7.3

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										
2018	4,404.9	4,489.0	991.0	844.2	2,569.7	5,741.9	6,024.9	682.6	4,356.4	702.9
2019	4,475.8	4,577.9	966.7	878.0	2,631.1	5,931.1	6,224.0	720.1	4,524.6	686.4
2020	4,723.6	4,841.3	898.2	1,012.0	2,813.4	6,119.9	6,390.1	700.2	4,725.1	694.6
2020 Q4	4,723.6	4,841.3	898.2	1,012.0	2,813.4	6,119.9	6,390.1	700.2	4,725.1	694.6
2021 Q1	4,782.9	4,900.9	895.1	1,017.5	2,870.2	6,173.4	6,435.8	695.4	4,785.0	693.1
Q2	4,745.5	4,865.8	833.7	971.9	2,939.9	6,240.3	6,496.9	693.4	4,851.1	695.7
Q3 [p)]	4,773.2	4,890.4	836.3	971.2	2,965.6	6,310.1	6,568.8	697.1	4,913.2	699.7
2021 Apr.	4,751.5	4,870.4	874.3	996.2	2,881.0	6,191.4	6,451.6	690.6	4,809.0	691.8
May	4,745.8	4,859.5	873.3	972.9	2,899.6	6,213.7	6,472.0	691.7	4,829.9	692.0
June	4,745.5	4,865.8	833.7	971.9	2,939.9	6,240.3	6,496.9	693.4	4,851.1	695.7
July	4,745.6	4,860.0	828.9	966.6	2,950.2	6,274.6	6,532.3	696.1	4,873.1	705.4
Aug.	4,754.0	4,871.5	828.6	968.5	2,956.8	6,291.2	6,552.2	695.8	4,893.0	702.3
Sep. [p)]	4,773.2	4,890.4	836.3	971.2	2,965.6	6,310.1	6,568.8	697.1	4,913.2	699.7
Transactions										
2018	124.1	176.3	17.8	32.8	73.5	166.1	188.4	41.2	134.2	-9.3
2019	115.6	143.4	-13.5	43.6	85.6	200.4	217.2	41.0	168.6	-9.2
2020	288.8	325.1	-54.1	138.9	204.0	209.2	195.0	-11.8	210.8	10.2
2020 Q4	3.5	22.3	-21.7	-1.5	26.6	60.8	68.0	-1.7	61.6	1.0
2021 Q1	59.6	59.5	-3.1	5.8	56.9	56.6	50.9	-3.1	60.4	-0.7
Q2	-25.8	-26.4	-57.6	-42.6	74.4	78.9	72.7	3.1	72.9	2.9
Q3 [p)]	39.4	45.5	4.6	0.6	34.2	64.1	69.0	4.6	63.4	-3.9
2021 Apr.	-22.8	-25.8	-17.4	-19.4	13.9	27.6	25.6	-0.7	28.1	0.1
May	-3.9	-11.7	-0.4	-22.8	19.2	23.0	21.2	1.5	21.0	0.6
June	1.0	11.1	-39.8	-0.4	41.2	28.3	25.9	2.3	23.8	2.2
July	13.5	10.2	-3.1	-3.2	19.7	26.0	27.6	2.4	22.9	0.6
Aug.	7.2	12.4	-0.2	1.6	5.8	17.2	20.4	0.3	19.9	-3.0
Sep. [p)]	18.7	22.9	7.8	2.2	8.7	20.9	21.1	1.9	20.6	-1.5
Growth rates										
2018	2.9	4.1	1.8	4.0	2.9	3.0	3.2	6.3	3.2	-1.3
2019	2.6	3.2	-1.4	5.2	3.3	3.5	3.6	6.0	3.9	-1.3
2020	6.5	7.1	-5.7	15.9	7.8	3.5	3.1	-1.6	4.7	1.5
2020 Q4	6.5	7.1	-5.7	15.9	7.8	3.5	3.1	-1.6	4.7	1.5
2021 Q1	4.6	5.3	-9.1	11.0	7.6	3.8	3.3	-1.6	5.0	1.5
Q2	1.4	1.9	-11.7	-2.2	7.3	4.5	4.0	0.6	5.7	0.6
Q3 [p)]	1.6	2.1	-8.5	-3.7	6.9	4.3	4.1	0.4	5.5	-0.1
2021 Apr.	2.6	3.2	-9.8	3.6	6.8	4.3	3.8	0.4	5.4	1.3
May	1.5	1.9	-7.7	-2.6	6.2	4.3	3.9	0.7	5.4	0.7
June	1.4	1.9	-11.7	-2.2	7.3	4.5	4.0	0.6	5.7	0.6
July	1.3	1.7	-11.3	-3.2	7.2	4.5	4.2	0.4	5.7	0.6
Aug.	1.0	1.5	-10.9	-3.9	6.7	4.5	4.2	0.1	5.8	0.1
Sep. [p)]	1.6	2.1	-8.5	-3.7	6.9	4.3	4.1	0.4	5.5	-0.1

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										
2018	389.2	6,817.4	1,940.0	56.1	2,099.7	2,721.6	1,030.0	460.2	187.0	194.9
2019	364.2	7,058.9	1,946.1	50.1	2,156.5	2,906.1	1,455.6	452.3	178.9	187.2
2020	748.5	6,967.2	1,916.7	42.1	1,994.9	3,013.6	1,428.7	539.3	130.1	139.2
2020 Q4	748.5	6,967.2	1,916.7	42.1	1,994.9	3,013.6	1,428.7	539.3	130.1	139.2
2021 Q1	698.7	6,892.6	1,897.6	41.2	1,984.7	2,969.1	1,392.6	388.1	127.2	130.2
Q2	657.0	6,848.6	1,868.5	40.4	1,953.6	2,986.2	1,404.1	375.2	123.7	134.5
Q3 [p)]	703.0	6,852.7	1,849.3	38.7	1,978.8	2,985.9	1,366.1	425.0	139.0	146.0
2021 Apr.	726.3	6,839.2	1,869.7	41.2	1,968.1	2,960.1	1,444.6	379.9	132.8	131.3
May	690.4	6,835.3	1,868.2	40.8	1,944.2	2,982.1	1,467.8	316.9	133.4	130.8
June	657.0	6,848.6	1,868.5	40.4	1,953.6	2,986.2	1,404.1	375.2	123.7	134.5
July	683.2	6,892.0	1,860.9	39.4	1,965.4	3,026.3	1,442.6	338.9	133.4	133.2
Aug.	723.1	6,868.4	1,848.2	39.0	1,962.1	3,019.1	1,456.8	345.6	125.3	128.4
Sep. [p)]	703.0	6,852.7	1,849.3	38.7	1,978.8	2,985.9	1,366.1	425.0	139.0	146.0
Transactions										
2018	45.5	51.0	-37.8	-4.9	16.1	77.6	88.4	42.6	16.2	23.6
2019	-24.3	107.8	-5.3	-3.3	27.3	89.0	309.5	19.3	-2.7	-2.5
2020	321.2	-32.8	-14.6	-8.0	-99.3	89.2	-49.5	156.4	-48.8	-48.0
2020 Q4	-57.5	2.1	-4.0	-0.9	-43.9	50.9	-110.5	100.7	-9.8	-8.1
2021 Q1	-49.7	-31.7	-22.5	-0.9	-33.5	25.2	2.9	-182.8	-2.9	-8.9
Q2	-41.8	-19.3	-22.4	-0.7	-26.1	30.0	-7.3	-2.1	-3.6	4.3
Q3 [p)]	46.0	-4.3	-19.9	-1.7	14.7	2.6	-49.0	27.8	15.3	11.5
2021 Apr.	27.6	-18.2	-20.2	0.0	-3.2	5.3	50.0	-1.0	5.6	1.0
May	-36.0	-27.4	-1.0	-0.3	-20.5	-5.5	-5.4	-58.4	0.6	-0.5
June	-33.4	26.3	-1.2	-0.4	-2.4	30.3	-51.9	57.3	-9.7	3.7
July	26.2	0.0	-7.4	-1.0	13.3	-4.8	16.1	-33.4	9.7	-1.3
Aug.	40.0	-16.7	-12.9	-0.4	-5.4	2.0	10.2	-0.2	-8.0	-4.8
Sep. [p)]	-20.2	12.4	0.4	-0.3	6.9	5.5	-75.2	61.4	13.7	17.6
Growth rates										
2018	13.0	0.8	-1.9	-8.0	0.8	2.9	-	-	8.1	7.7
2019	-6.3	1.6	-0.3	-5.9	1.3	3.2	-	-	-1.5	-1.5
2020	88.4	-0.5	-0.8	-15.9	-4.6	3.0	-	-	-27.3	-25.7
2020 Q4	88.4	-0.5	-0.8	-15.9	-4.6	3.0	-	-	-27.3	-25.7
2021 Q1	56.3	-0.3	-1.6	-12.7	-4.1	3.5	-	-	-30.7	-33.7
Q2	-10.6	-0.6	-2.7	-8.2	-4.8	3.9	-	-	-22.3	-22.9
Q3 [p)]	-12.8	-0.8	-3.6	-9.9	-4.3	3.7	-	-	-0.6	-0.9
2021 Apr.	27.8	-0.3	-2.3	-10.8	-4.2	4.0	-	-	-29.2	-35.4
May	5.3	-0.9	-2.7	-9.6	-4.9	3.1	-	-	-32.1	-38.1
June	-10.6	-0.6	-2.7	-8.2	-4.8	3.9	-	-	-22.3	-22.9
July	-9.6	-0.5	-3.0	-9.4	-4.0	3.7	-	-	-17.9	-23.5
Aug.	-11.8	-0.8	-3.9	-9.4	-3.8	3.4	-	-	-26.5	-27.7
Sep. [p)]	-12.8	-0.8	-3.6	-9.9	-4.3	3.7	-	-	-0.6	-0.9

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
2017	-0.9	-1.4	0.1	0.2	0.2	1.0
2018	-0.4	-1.0	0.1	0.2	0.3	1.4
2019	-0.6	-1.0	0.0	0.0	0.3	1.0
2020	-7.2	-5.9	-0.4	0.0	-0.9	-5.7
2020 Q3	-5.2	.	.	.	.	-3.7
Q4	-7.2	.	.	.	.	-5.7
2021 Q1	-8.4	.	.	.	.	-6.8
Q2	-7.0	.	.	.	.	-5.6

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
2017	46.2	45.8	12.8	13.0	15.2	0.4	47.1	43.3	9.9	5.3	1.9	22.4	3.8
2018	46.4	45.9	12.9	13.0	15.2	0.5	46.9	43.2	9.9	5.3	1.8	22.3	3.7
2019	46.3	45.8	12.9	13.0	15.0	0.5	46.9	43.2	9.9	5.3	1.6	22.4	3.7
2020	46.6	46.1	13.0	12.8	15.6	0.5	53.8	49.2	10.7	6.0	1.5	25.5	4.6
2020 Q3	46.6	46.1	13.0	12.8	15.5	0.4	51.8	47.6	10.5	5.8	1.6	24.8	4.2
Q4	46.6	46.1	13.0	12.8	15.6	0.5	53.8	49.2	10.7	6.0	1.5	25.5	4.6
2021 Q1	46.5	46.1	13.0	12.7	15.7	0.5	54.9	50.2	10.8	6.1	1.5	25.8	4.6
Q2	46.3	45.8	12.8	12.8	15.5	0.5	53.3	48.7	10.5	5.9	1.5	25.0	4.6

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

6.3 Government debt-to-GDP ratio

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

	Total	Financial instrument			Holder			Original maturity		Residual maturity			Currency	
		Currency and deposits	Loans	Debt securities	Resident creditors	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
2017	87.5	3.2	14.5	69.9	48.0	32.0	39.5	8.6	78.9	16.4	28.9	42.3	85.7	1.8
2018	85.5	3.1	13.7	68.7	47.9	32.2	37.7	8.1	77.5	16.0	28.3	41.2	84.1	1.5
2019	83.6	3.0	12.9	67.6	45.2	30.4	38.4	7.6	75.9	15.6	27.7	40.3	82.2	1.4
2020	97.3	3.2	14.2	79.9	54.6	39.1	42.7	11.3	86.0	19.1	31.5	46.7	95.6	1.7
2020 Q3	96.6	3.1	13.9	79.6	.	.	.	.	.	.	.	.	.	.
Q4	97.3	3.2	14.2	79.9	.	.	.	.	.	.	.	.	.	.
2021 Q1	100.0	3.2	14.1	82.7	.	.	.	.	.	.	.	.	.	.
Q2	98.3	3.1	13.9	81.4	.	.	.	.	.	.	.	.	.	.

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

6 Fiscal developments

6.4 Annual change in the government debt-to-GDP ratio and underlying factors [1)]

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

	Change in debt-to-GDP ratio [2)]	Primary deficit (+)/ surplus (-)	Deficit-debt adjustment								Interest-growth differential	Memo item: Borrowing requirement
			Total	Transactions in main financial assets					Revaluation effects and other changes in volume	Other		
				Total	Currency and deposits	Loans	Debt securities	Equity and investment fund shares				
	1	2	3	4	5	6	7	8	9	10	11	12
2017	-2.5	-1.0	-0.1	0.4	0.5	0.0	-0.1	0.1	-0.2	-0.4	-1.3	1.0
2018	-2.0	-1.4	0.4	0.5	0.4	-0.1	0.0	0.2	0.1	-0.1	-1.0	0.8
2019	-2.0	-1.0	0.1	0.3	0.1	0.0	0.0	0.2	-0.2	0.0	-1.1	0.9
2020	13.8	5.7	2.3	2.5	2.0	0.4	-0.1	0.1	-0.1	-0.1	5.8	9.6
2020 Q3	11.3	3.7	3.0	3.2	2.9	0.3	-0.1	0.1	-0.3	0.0	4.6	8.5
Q4	13.8	5.7	2.3	2.5	2.0	0.4	-0.1	0.1	-0.1	-0.2	5.8	9.6
2021 Q1	14.3	6.8	1.9	2.2	1.6	0.5	0.0	0.2	-0.1	-0.3	5.5	10.3
Q2	3.9	5.6	-1.3	-0.4	-1.0	0.4	0.0	0.2	0.0	-0.9	-0.3	5.8

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

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

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

6.5 Government debt securities [1)]

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

	Debt service due within 1 year [2)]					Average residual maturity in years [3)]	Average nominal yields [4)]						
	Total	Principal		Interest			Outstanding amounts					Transactions	
			Maturities of up to 3 months		Maturities of up to 3 months		Total	Floating rate	Zero coupon	Fixed rate	Maturities of up to 1 year	Issuance	Redemption
	1	2	3	4	5	6	7	8	9	10	11	12	13
2018	12.5	11.0	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	10.8	3.6	1.4	0.4	7.5	2.2	1.3	-0.1	2.5	2.1	0.3	1.1
2020	14.9	13.6	4.2	1.4	0.3	7.6	1.9	1.1	-0.2	2.2	2.3	0.0	0.8
2020 Q2	15.3	13.9	5.0	1.4	0.4	7.5	2.0	1.1	-0.2	2.3	2.0	0.1	0.9
Q3	15.8	14.5	4.7	1.4	0.3	7.5	1.9	1.1	-0.2	2.3	2.2	0.1	0.8
Q4	14.9	13.6	4.2	1.4	0.3	7.6	1.9	1.1	-0.2	2.2	2.3	0.0	0.8
2021 Q1	15.7	14.3	5.5	1.4	0.4	7.8	1.8	1.1	-0.2	2.1	2.1	0.0	0.5
2021 Apr.	15.8	14.4	5.1	1.4	0.4	7.9	1.7	1.0	-0.3	2.1	2.1	-0.1	0.6
May	15.7	14.3	4.7	1.4	0.3	7.9	1.7	0.5	-0.3	2.1	2.1	-0.1	0.6
June	15.5	14.2	5.2	1.4	0.3	7.9	1.7	0.5	-0.3	2.0	2.1	-0.1	0.5
July	15.4	14.1	5.2	1.3	0.3	7.9	1.6	0.5	-0.3	2.0	1.9	-0.1	0.5
Aug.	15.4	14.0	5.4	1.4	0.3	7.9	1.7	1.1	-0.3	2.0	1.9	-0.1	0.5
Sep.	15.5	14.1	4.7	1.4	0.3	7.9	1.7	1.1	-0.3	2.0	1.9	-0.1	0.5

Source: ECB.

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

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

3) Residual maturity at the end of the period.

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

6 Fiscal developments

6.6 Fiscal developments in euro area countries

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

	Belgium	Germany	Estonia	Ireland	Greece	Spain	France	Italy	Cyprus
	1	2	3	4	5	6	7	8	9
	Government deficit (-)/surplus (+)								
2017	-0.7	1.3	-0.5	-0.3	0.6	-3.0	-3.0	-2.4	1.9
2018	-0.8	1.9	-0.6	0.1	0.9	-2.5	-2.3	-2.2	-3.5
2019	-1.9	1.5	0.1	0.5	1.1	-2.9	-3.1	-1.5	1.3
2020	-9.1	-4.3	-5.6	-4.9	-10.1	-11.0	-9.1	-9.6	-5.7
2020 Q3	-7.1	-2.8	-4.0	-3.4	-5.5	-8.2	-7.2	-7.4	-4.2
Q4	-9.1	-4.3	-5.6	-4.9	-10.1	-11.0	-9.1	-9.6	-5.7
2021 Q1	-8.8	-5.8	-5.6	-5.6	-12.6	-11.6	-10.5	-10.2	-7.4
Q2	-6.4	-5.2	-4.3	-4.4	-11.2	-8.7	-9.2	-8.9	-6.2
	Government debt								
2017	102.0	64.7	9.1	67.8	179.5	98.6	98.1	134.2	92.9
2018	99.9	61.3	8.2	63.1	186.4	97.5	97.8	134.4	98.4
2019	97.7	58.9	8.6	57.2	180.7	95.5	97.5	134.3	91.1
2020	112.8	68.7	19.0	58.4	206.3	120.0	115.0	155.6	115.3
2020 Q3	112.0	69.1	19.1	61.2	199.8	114.1	115.4	154.2	116.0
Q4	112.8	68.7	19.0	58.4	205.7	120.0	115.0	155.6	115.3
2021 Q1	116.9	69.9	19.6	60.4	209.0	125.3	117.9	159.6	121.4
Q2	113.7	69.7	19.6	59.1	207.2	122.8	114.6	156.3	112.0

	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Austria	Portugal	Slovenia	Slovakia	Finland
	10	11	12	13	14	15	16	17	18	19
	Government deficit (-)/surplus (+)									
2017	-0.8	0.4	1.4	3.2	1.3	-0.8	-3.0	-0.1	-1.0	-0.7
2018	-0.8	0.5	3.0	1.9	1.4	0.2	-0.3	0.7	-1.0	-0.9
2019	-0.6	0.5	2.3	0.5	1.7	0.6	0.1	0.4	-1.3	-0.9
2020	-4.5	-7.2	-3.5	-9.7	-4.2	-8.3	-5.8	-7.7	-5.5	-5.5
2020 Q3	-3.5	-4.1	-2.6	-7.0	-2.5	-4.5	-4.2	-4.9	-4.0	-4.1
Q4	-4.5	-7.2	-3.5	-9.7	-4.2	-8.3	-5.8	-7.7	-5.5	-5.5
2021 Q1	-6.6	-7.2	-2.5	-10.0	-5.8	-10.6	-7.0	-8.2	-6.4	-6.0
Q2	-7.0	-5.4	-0.6	-8.6	-4.2	-8.5	-5.8	-6.4	-6.2	-4.4
	Government debt									
2017	39.0	39.1	21.8	47.7	56.9	78.5	126.1	74.2	51.6	61.2
2018	37.1	33.7	20.8	43.6	52.4	74.0	121.5	70.3	49.6	59.8
2019	36.7	35.9	22.3	40.7	48.5	70.6	116.6	65.6	48.1	59.5
2020	43.2	46.6	24.8	53.4	54.3	83.2	135.2	79.8	59.7	69.5
2020 Q3	44.4	45.4	26.2	51.5	55.1	78.5	131.6	77.8	60.2	67.2
Q4	43.2	46.6	24.8	53.4	54.3	83.2	135.2	79.8	60.1	69.5
2021 Q1	45.4	45.1	28.0	57.5	54.9	87.0	139.1	84.9	60.1	70.4
Q2	43.3	44.6	26.2	59.5	54.2	86.2	135.4	80.0	61.4	69.4

Source: Eurostat.

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