Economic Bulletin

Contents

Update on economic, financial and monetary developments

Summary

The inflation outlook continues to be too high for too long. In light of the ongoing high inflation pressures, the Governing Council decided at its meeting on 4 May 2023 to raise the three key ECB interest rates by 25 basis points. Overall, the incoming information broadly supports the assessment of the medium-term inflation outlook that the Governing Council formed at its previous monetary policy meeting on 16 March. Headline inflation has declined over recent months, but underlying price pressures remain strong. At the same time, the past rate increases are being transmitted forcefully to euro area financing and monetary conditions, while the lags and strength of transmission to the real economy remain uncertain.

The Governing Council's future decisions will ensure that the policy rates will be brought to levels sufficiently restrictive to achieve a timely return of inflation to its 2% medium-term target and will be kept at those levels for as long as necessary. The Governing Council will continue to follow a data-dependent approach to determining the appropriate level and duration of restriction. In particular, the policy rate decisions will continue to be based on the Governing Council's assessment of the inflation outlook in light of the incoming economic and financial data, the dynamics of underlying inflation, and the strength of monetary policy transmission.

The key ECB interest rates remain the Governing Council's primary tool for setting the monetary policy stance. In parallel, the Governing Council will keep reducing the Eurosystem's asset purchase programme (APP) portfolio at a measured and predictable pace. In line with these principles, the Governing Council expects to discontinue the reinvestments under the APP as of July 2023.

Economic activity

Global economic activity was stronger than expected in early 2023. The global economy was supported by China's economic reopening after the end of its zero-COVID policy, along with resilience in the US labour market – significant monetary policy tightening notwithstanding. Trade, however, remained relatively weak as the recovery in activity was concentrated in less trade-intensive demand components, such as services. Global headline inflation continues to recede, while core inflation remains at elevated levels.

The euro area economy grew by 0.1% in the first quarter of 2023, according to Eurostat's preliminary flash estimate. Lower energy prices, the easing of supply bottlenecks and fiscal policy support for firms and households have contributed to

the resilience of the economy. At the same time, private domestic demand, especially consumption, is likely to have remained weak.

Business and consumer confidence have recovered steadily in recent months but remain weaker than before Russia's unjustified war against Ukraine and its people. The Governing Council sees a divergence across sectors of the economy. The manufacturing sector is working through a backlog of orders, but its prospects are worsening. The services sector is growing more strongly, especially owing to the reopening of the economy.

Household incomes are benefiting from the strength of the labour market, with the unemployment rate falling to a new historical low of 6.5% in March. Employment has continued to grow and total hours worked exceed pre-pandemic levels. At the same time, the average number of hours worked remains somewhat below its pre-pandemic level and its recovery has stalled since mid-2022.

As the energy crisis fades, governments should roll back the related support measures promptly and in a concerted manner to avoid driving up medium-term inflationary pressures, which would call for a stronger monetary policy response. Fiscal policies should be oriented towards making the euro area economy more productive and gradually bringing down high public debt. Policies to enhance the euro area's supply capacity, especially in the energy sector, can also help reduce price pressures in the medium term. In this regard, the Governing Council welcomes the publication of the European Commission's legislative proposals for the reform of the EU's economic governance framework, which should be concluded soon.

Inflation

According to Eurostat's flash estimate, inflation was 7.0% in April, after having dropped from 8.5% in February to 6.9% in March. While base effects led to some increase in energy price inflation, from -0.9% in March to 2.5% in April, the rate stands far below those recorded after the start of Russia's war against Ukraine. Food price inflation remains elevated, however, standing at 13.6% in April, after 15.5% in March.

Price pressures remain strong. Inflation excluding energy and food was 5.6% in April, having edged down slightly compared with March to return to its February level. Non-energy industrial goods inflation fell to 6.2% in April, from 6.6% in March, when it declined for the first time in several months. But services inflation increased to 5.2% in April, from 5.1% in March. Inflation is still being pushed up by the gradual pass-through of past energy cost increases and supply bottlenecks. In services, especially, it is still being pushed higher also by pent-up demand from the reopening of the economy and by rising wages. The information available up to March suggests that indicators of underlying inflation remain high.

Wage pressures have strengthened further as employees, in a context of a robust labour market, recoup some of the purchasing power they have lost as a result of high inflation. Moreover, in some sectors firms have been able to increase their profit

margins on the back of mismatches between supply and demand and the uncertainty created by high and volatile inflation. Although most measures of longer-term inflation expectations currently stand at around 2%, some indicators have edged up and warrant continued monitoring.

Risk assessment

Renewed financial market tensions, if persistent, would pose a downside risk to the outlook for growth as they could tighten broader credit conditions more strongly than expected and dampen confidence. Russia's war against Ukraine also continues to be a significant downside risk to the economy. However, the recent reversal of past adverse supply shocks, if sustained, could spur confidence and support higher growth than currently expected. The continued resilience of the labour market, by bolstering household confidence and spending, could also lead to higher growth than anticipated.

There are still significant upside risks to the inflation outlook. These include existing pipeline pressures that could send retail prices higher than expected in the near term. Moreover, Russia's war against Ukraine could again push up the costs of energy and food. A lasting rise in inflation expectations above the Governing Council's target, or higher than anticipated increases in wages or profit margins, could also drive inflation higher, including over the medium term. Recent negotiated wage agreements have added to the upside risks to inflation, especially if profit margins remain high. The downside risks include renewed financial market tensions, which could bring inflation down faster than projected. Weaker demand, due for example to a more marked slowing of bank lending or a stronger transmission of monetary policy, would also lead to lower price pressures than currently anticipated, especially over the medium term.

Financial and monetary conditions

The euro area banking sector has proved resilient in the face of the financial market tensions that arose ahead of the Governing Council's meeting in March. The Governing Council's policy rate increases are being transmitted strongly to risk-free interest rates and to the financing conditions for firms, households and banks. For firms and households, loan growth has weakened owing to higher borrowing rates, tighter credit supply conditions and lower demand. The latest euro area bank lending survey reported a tightening of overall credit standards, which was stronger than banks had expected in the previous round and suggests that lending may weaken further. Weak lending has meant that money growth has also continued to decline.

Monetary policy decisions

At its meeting on 4 May 2023, the Governing Council decided to raise the three key ECB interest rates by 25 basis points. Accordingly, the interest rate on the main

refinancing operations and the interest rates on the marginal lending facility and the deposit facility were increased to 3.75%, 4.00% and 3.25% respectively, with effect from 10 May 2023.

The APP portfolio is declining at a measured and predictable pace, as the Eurosystem does not reinvest all of the principal payments from maturing securities. The decline will amount to €15 billion per month on average until the end of June 2023. The Governing Council expects to discontinue the reinvestments under the APP as of July 2023.

As concerns the pandemic emergency purchase programme (PEPP), the Governing Council intends to reinvest the principal payments from maturing securities purchased under the programme until at least the end of 2024. In any case, the future roll-off of the PEPP portfolio will be managed to avoid interference with the appropriate monetary policy stance.

The Governing Council will continue applying flexibility in reinvesting redemptions coming due in the PEPP portfolio, with a view to countering risks to the monetary policy transmission mechanism related to the pandemic.

As banks are repaying the amounts borrowed under the targeted longer-term refinancing operations, the Governing Council will regularly assess how targeted lending operations are contributing to its monetary policy stance.

Conclusion

Summing up, the inflation outlook continues to be too high for too long. In light of the ongoing high inflation pressures, the Governing Council decided at its meeting on 4 May 2023 to raise the three key ECB interest rates by 25 basis points. Overall, the incoming information broadly supports the assessment of the medium-term inflation outlook that the Governing Council formed at its previous monetary policy meeting on 16 March. Headline inflation has declined over recent months, but underlying price pressures remain strong. At the same time, the past rate increases are being transmitted forcefully to euro area financing and monetary conditions, while the lags and strength of transmission to the real economy remain uncertain.

The Governing Council's future decisions will ensure that the policy rates will be brought to levels sufficiently restrictive to achieve a timely return of inflation to its 2% medium-term target and will be kept at those levels for as long as necessary. The Governing Council will continue to follow a data-dependent approach to determining the appropriate level and duration of restriction. In particular, the policy rate decisions will continue to be based on the Governing Council's assessment of the inflation outlook in light of the incoming economic and financial data, the dynamics of underlying inflation, and the strength of monetary policy transmission.

In any case, the Governing Council stands ready to adjust all of its instruments within its mandate to ensure that inflation returns to its medium-term target and to preserve the smooth functioning of monetary policy transmission.

1   External environment

Global economic activity in early 2023 was stronger than expected. The global economy was supported by China's economic reopening after the end of its zero-COVID policy, along with resilience in the US labour market – significant monetary policy tightening notwithstanding. Trade, however, remained relatively weak, as the recovery in activity was concentrated in less trade-intensive demand components such as services. Headline inflation across OECD economies continues to recede, while core inflation remains at elevated levels.

Global economic activity surprised to the upside at the start of the year.
Incoming data for both emerging and advanced economies were stronger than expected, driven largely by the economic reopening in China (Chart 1). The global composite output Purchasing Managers' Index (PMI) increased further in March and reached 51.8 for the first quarter, up from 48.4 in the previous quarter. PMI data signal a growing divergence between services, which stood at an eight-month high in March, and manufacturing, which weakened further into contractionary territory in some major advanced economies.

Chart 1

Citigroup economic data surprises
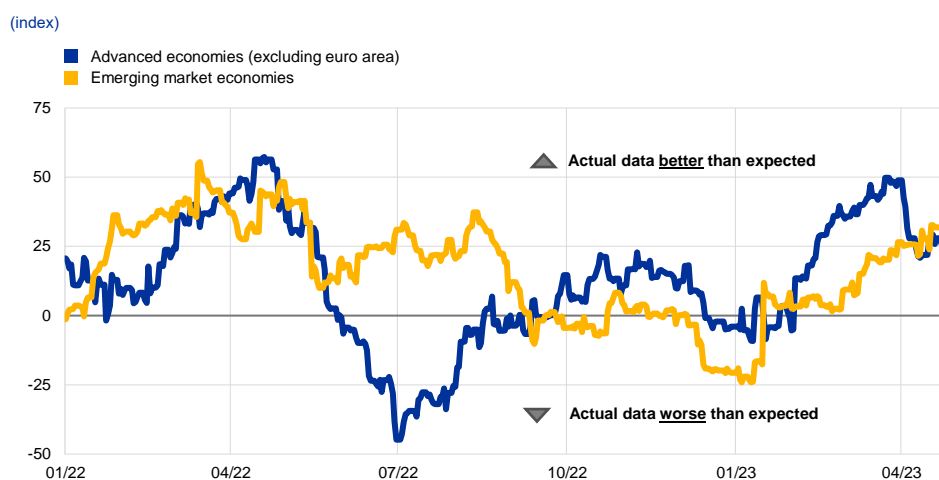
(index)

Sources: Citigroup, Haver and ECB staff calculations.
Notes: The index is a weighted average of historical standard deviations of data surprises (difference between expectations and releases) for a range of economic indicators. The index averages daily observations over a three-month rolling window. The latest observations are for 3 May 2023.

In contrast to the positive momentum in economic activity, global trade remains subdued. Momentum in world merchandise trade growth (in three-month-on-three-month terms) remained negative in February (Chart 2). The weakness in trade relative to economic activity is due in part to composition effects, as the recent rebound in activity was primarily driven by less trade-intensive services and consumption. Trade is expected to gradually pick up, also benefiting from the normalisation of global supply constraints. The PMI supply shortage index improved further in March, having crossed above the neutral threshold in February for the first time since the start of the coronavirus (COVID-19) pandemic.

Chart 2

Merchandise trade momentum

(real imports, 3-month-on-3-month percentage changes)

- Advanced economies (excluding euro area)
- Emerging Asia (excluding China)
- China
- Other EMEs (excluding Asia)
- World (excluding euro area)
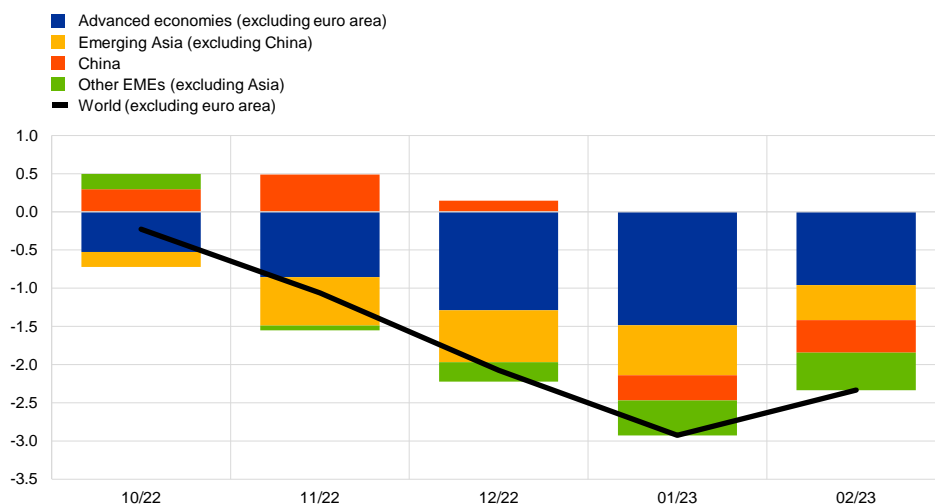
Sources: CPB and ECB staff calculations.
Note: The latest observations are for February 2023.

Inflation across OECD economies continued to decrease, but core inflationary pressures remain persistently high. In March, annual headline consumer price index (CPI) inflation across OECD countries (excluding Türkiye) decreased sharply to 5.8% year on year, from 7.3% in February, largely owing to lower energy price inflation (Chart 3). By contrast, excluding food and energy prices, OECD core inflation (excluding Türkiye) continues to signal more persistence in underlying price pressures, decelerating to 4.5% in March from 4.8% in February.

Chart 3

OECD consumer price inflation

(year-on-year percentage changes)

- Core
- Food
- Headline
- Energy
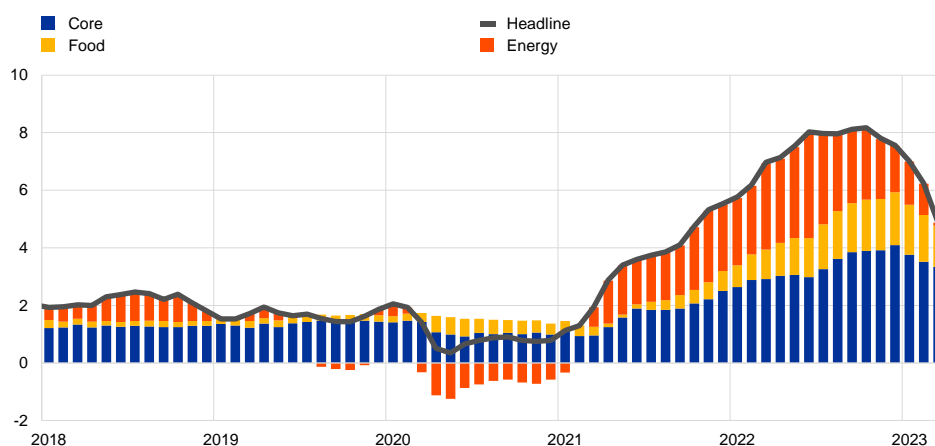
Sources: OECD and ECB staff calculations.
Notes: The OECD aggregate excludes Türkiye and is calculated using OECD CPI annual weights. The latest observations are for March 2023.

Oil prices remained broadly unchanged (+1%) since the March Governing Council meeting, as the oil price increase in reaction to the OPEC+ supply cut

was counterbalanced by concerns about demand amid the recent US banking sector stress. Oil prices increased by 9% immediately after OPEC+ announced plans to reduce oil production by close to 1.7 million barrels per day (Chart 4). OPEC+ communicated an intention to act pre-emptively to stabilise oil markets in anticipation of weaker global oil demand. However, the gains in oil prices following the OPEC+ announcement were broadly reversed as oil prices continued to be affected by downside risks to US demand amid recent stress in the banking sector. However, if such downside risks do not materialise, it is worth noting that the production cut will take place in the second half of 2023, when an oil supply deficit is expected by the International Energy Agency. European gas prices fell 13% to below 40 EUR/MWh, while the EU enters the gas storage replenishment season at record-high storage levels. With the prolongation of EU gas saving measures – which envisage Member States reducing gas consumption by 15% between 1 April 2023 and 31 March 2024 – the EU is on track to achieve its 90% storage target for November 2023. Non-energy commodity prices have remained broadly unchanged since the March Governing Council meeting. International food commodity prices continued to be affected by severe droughts in Argentina and the announcements of temporary bans imposed by Poland, Hungary and Slovakia on Ukrainian grain imports, which counterbalanced the effects of the extension of the Black Sea Grain Initiative on grain prices. Meanwhile, metal prices were supported by higher Chinese demand following the recent reopening of the Chinese economy, but were weighed down by concerns over global demand amid stress in the banking sector.

Chart 4

Oil price developments

(USD per barrel)
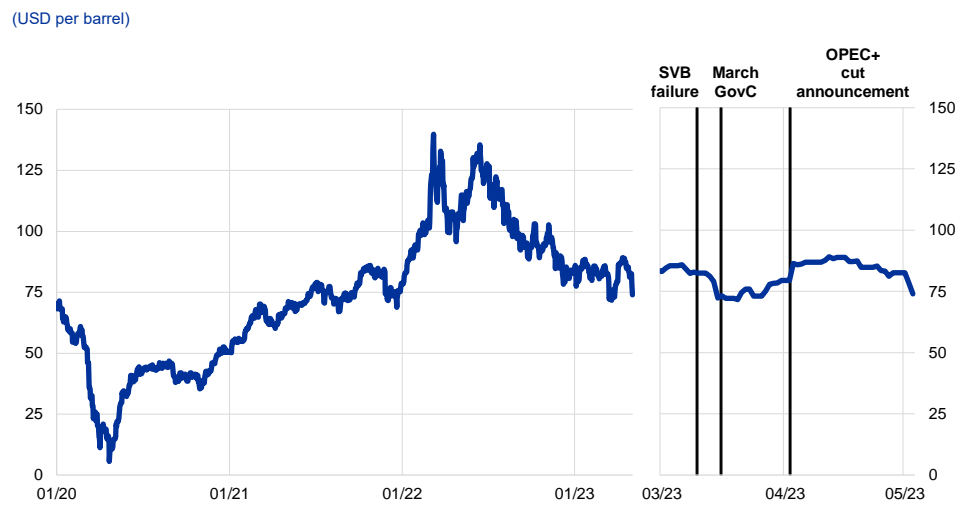
Source: Refinitiv.
Notes: The lines mark the following events: 10 March 2023 for the Silicon Valley Bank failure, 16 March 2023 for the March Governing Council meeting and 2 April 2023 for the OPEC+ cut announcement. The latest observations are for 3 May 2023.

In the United States, economic activity is moderating, reflecting weak domestic demand. GDP growth for the first quarter of 2023 was 0.3% (quarter on quarter), half that of the previous quarter, mainly reflecting a decline in private inventories and a weakening in non-residential investment. Private consumption regained momentum, reflecting a one-off reduction in taxes in January, while it remained subdued for the rest of the quarter. The failure of Silicon Valley Bank (SVB) triggered

severe but short-lived stress in the banking sector, which led to a tightening of lending conditions that may weigh on consumer spending. Meanwhile, the labour market remains resilient despite the monetary policy tightening. Nominal wage growth is easing but remains high, signalling ongoing tightness in the labour market. Annual headline inflation declined to 5.0% in March from 6.0% in February, primarily owing to base effects in energy prices related to the spike in energy prices following Russia's invasion of Ukraine in 2022. However, underlying inflationary pressures remain high, with core inflation increasing marginally to 5.6% in March due to high service price inflation.

The Chinese economy is rebounding rapidly. Economic growth in the first quarter of this year was stronger than expected, following the decline in economic activity around the turn of the year, which was related to the departure from zero-COVID policy measures and a subsequent increase in COVID-19 cases. GDP in the first quarter expanded by 2.2% quarter on quarter. The rebound in consumer spending was more frontloaded than expected, with consumption and activity in the services sector driving growth, while manufacturing and investment remained subdued. Meanwhile, the property sector is showing signs of a nascent recovery. Completions and sales of residential properties rebounded in month-on-month terms at the start of the year, while staying relatively flat year on year. Average home prices increased for the first time in 18 months, driven by developments in China's largest and most developed cities.

In Japan, economic activity was recovering in the first quarter of the year, with inflationary pressures further broadening. High-frequency data suggest that consumer spending and confidence may be picking up, moderately supporting domestic demand despite the persistent decrease in real wages. Annual headline inflation slowed sharply in February, reflecting the impact of new government energy subsidies. Underlying price pressures are broadening, however, with core inflation increasing further to 2.3% in March, the highest level since 1992 (if VAT hike effects are excluded). Moreover, wage pressures in Japan are likely to rise, as the early rounds of the spring wage negotiations (Shunto) point to substantial wage increases compared with previous years. Regarding bond markets, the significant upward pressures on Japanese government bond yields over recent months began to ease after global yields fell amid stress in the banking sector. Overall, ten-year yields now stand somewhat below their upper target bounds as imposed by the Bank of Japan.

The United Kingdom avoided a recession, but economic prospects remain subdued. GDP increased by 0.1% (in three-month-on-three-month terms) in the three months to February, driven mainly by an improvement in the services and construction sectors. While the economy steered clear of a technical recession, declining real wages, rising interest rates and a housing market downturn continue to weigh on economic activity and point towards anaemic growth over the remainder of the year. At the same time, credit conditions appear to be stable after the recent financial market stress. Headline annual CPI inflation remains very high and stood at 10.1% in March, above market expectations, while core inflation remained unchanged at 6.2%. The government extended energy subsidies from April to June, which will lower the annual inflation rate by 1 percentage point from the second

quarter of 2023. Underlying price pressures are expected to remain elevated until mid-2024.

The rise in consumer prices and weakening external demand pose headwinds to growth across key emerging market economies (EMEs). PMI new export orders in manufacturing stayed in contractionary territory in March among EMEs, and also deteriorated in several countries compared with February. Moreover, high inflation is also weighing on growth prospects across EMEs, as it erodes consumers' purchasing power. While declining energy and food prices and the waning impact of past currency depreciations in several EME economies support lower headline inflation, core inflation remains high and shows only limited signs of decline. The recovery in China provides some short-term support to growth in Asia. However, its impact is unlikely to persist in an environment of slowing global demand.

2 Economic activity

Euro area real GDP grew by 0.1% in the first quarter of 2023. Lower energy prices, the easing of supply bottlenecks and fiscal policy support for firms and households have contributed to the resilience of the economy. At the same time, private domestic demand, especially consumption, is likely to have remained weak. Business and consumer confidence have recovered steadily in recent months but remain weaker than before Russia's unjustified war against Ukraine and its people. The manufacturing sector is working through a backlog of orders, but its prospects are worsening. Meanwhile, the services sector is growing more strongly, especially owing to the reopening of the economy. Household incomes are benefiting from the strength of the labour market, with the unemployment rate falling to a new historical low. As the energy crisis fades, governments should roll back the related support measures promptly and in a concerted manner to avoid driving up medium-term inflationary pressures, which would call for a stronger monetary policy response. Fiscal policies should be oriented towards making the economy more productive and gradually bringing down high public debt. Policies to enhance the euro area's supply capacity, especially in the energy sector, could also help reduce price pressures in the medium term. Downside risks to the outlook for growth relate to renewed and persistent financial market tensions, alongside Russia's war against Ukraine. However, a sustained reversal of past adverse supply shocks as well as the continued resilience of the labour market could also lead to higher growth than anticipated.

Euro area output rose marginally in the first quarter of 2023. According to Eurostat's preliminary flash estimate, growth edged up by 0.1% in the first quarter of the year, after stagnating at the end of 2022 (Chart 5). Several factors are shaping euro area growth at the current juncture. Activity is being stimulated by fiscal support measures – which are helping to contain the adverse impact of high energy inflation – and resilient labour markets. However, headwinds persist in the form of continued high inflation and a further tightening of financing conditions.[1] While a breakdown of growth into contributing factors is not available, short-term indicators and the available country data suggest that on the expenditure side weak private domestic demand was offset by more resilient exports.

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[1] See the box entitled "A model-based assessment of the macroeconomic impact of the ECB's monetary policy tightening since December 2021" in this issue of the Economic Bulletin.

Chart 5

Euro area real GDP, composite output PMI and ESI

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

- Real GDP (left-hand scale)
- Composite output PMI (right-hand scale)
- ESI (right-hand scale)
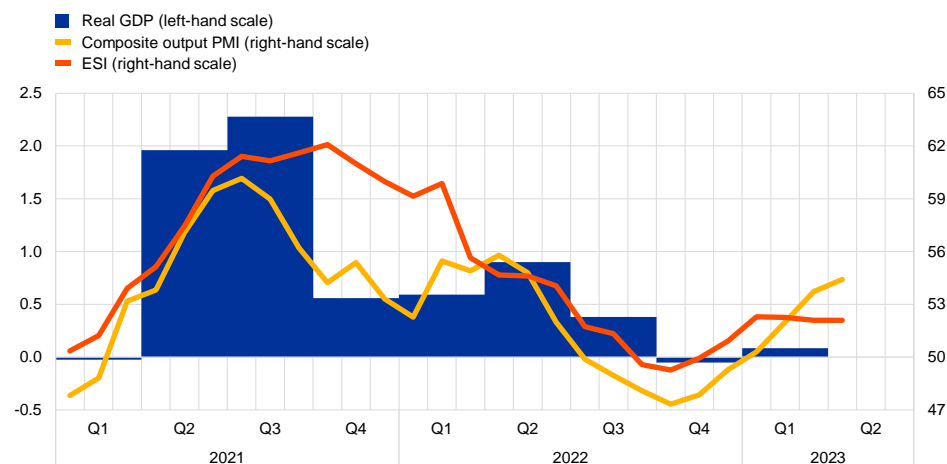
Sources: Eurostat, European Commission, S&P Global Market Intelligence and ECB calculations.
Notes: The two lines indicate monthly developments; the bars show quarterly data. The European Commission's Economic Sentiment Indicator (ESI) has been standardised and rescaled to have the same mean and standard deviation as the composite output Purchasing Managers' Index (PMI). The latest observations are for the first quarter of 2023 for real GDP and April 2023 for the ESI and the composite output PMI.

The incoming data that have so far become available for the second quarter of 2023 suggest continued positive but moderate growth. In April 2023 the euro area composite output Purchasing Managers' Index (PMI) stood at 54.4, above the first quarter average of 52.0 and in line with an expanding level of output. This increase was driven exclusively by business activity in the services sector, which now stands well above the no-growth threshold of 50, benefiting from the continuing reopening of the economy (Chart 6). Despite being supported by healthy order books, the manufacturing output PMI declined to below 50, partly on account of the unfavourable effects of the strikes in France, where manufacturing output fell to its lowest level since May 2020. The European Commission's Economic Sentiment Indicator (ESI) paints a broadly similar picture. In the latest ECB Survey of Professional Forecasters, which was conducted in early April, respondents forecast low but positive growth in the second quarter of 2023, followed by a slight increase in growth in the third quarter.[2] As the adverse effects of Russia's invasion of Ukraine – linked to high inflation, elevated uncertainty and slow foreign demand – slowly abate, a gradual recovery is expected on the back of a resilient labour market and a further easing of supply-side conditions.

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2   See "Results of the ECB Survey of Professional Forecasters for the second quarter of 2023", *press release*, ECB, 5 May 2023.

Chart 6

Value added, production and PMI for manufacturing and services

(left-hand scale: quarter-on-quarter percentage changes; right-hand scale: index, February 2021 = 50, diffusion index)

■ Value added (left-hand scale)
— Production (right-hand scale)
— PMI output/activity (right-hand scale)
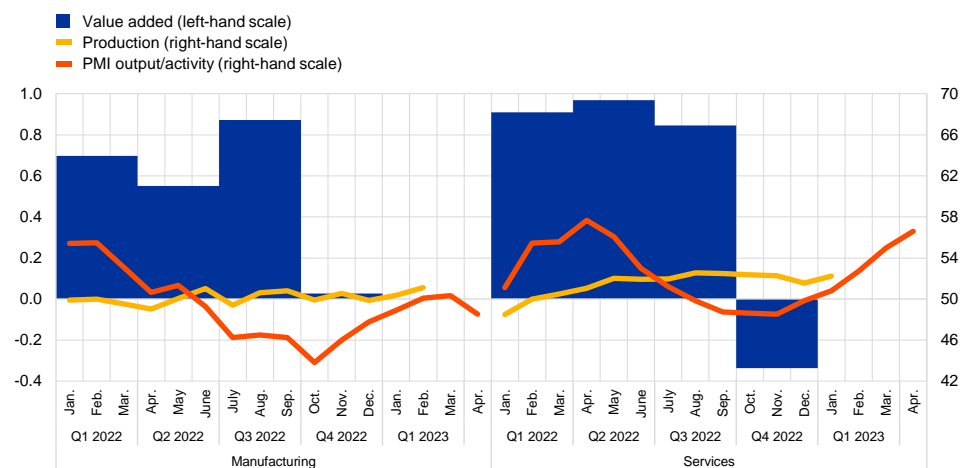
Sources: S&P Global Market Intelligence, Eurostat and ECB calculations.
Notes: The latest observation is for the fourth quarter of 2022 for value added and April 2023 for PMI output/activity. In the manufacturing panel, the latest observation for production is for February 2023, while in the services panel, it is for January 2023 (with an estimate for February 2023 based on available country data).

The labour market in the euro area remains resilient. The unemployment rate stood at 6.5% in March 2023, marginally lower than the rate of 6.6% in February and 0.9 percentage points lower than the pre-pandemic level observed in February 2020 (Chart 7). Quarter on quarter, total employment rose by 0.3% in the fourth quarter of 2022, after growing by 0.3% in the third quarter, supported by an increasing labour force (boosted, among other factors, by more inward migration). As a result of the economic recovery that followed the lifting of pandemic-related restrictions, job retention schemes largely ceased, returning to their pre-crisis level of around 0.3% of the labour force at the end of 2022. However, average hours worked in the fourth quarter of 2022 were still 1.6% below pre-pandemic levels, partially offsetting the strong increase in employment. The low level of average hours worked was a common feature across all main sectors of economic activity. While the number of average hours worked decreased by 1.2% in the industry sector (excluding construction) and by 1.4% in the market services sector relative to pre-pandemic levels, the decline was more substantial in the construction and public sectors – at around -1.9% and -2.4% respectively. In addition to sectoral drivers, the number of average hours worked appears to have been affected by the rise in sick leave in the second half of 2022.

Chart 7

Euro area employment, 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)

■ Employment (left-hand scale)
— PMI assessment of employment (left-hand scale)
— Unemployment rate (right-hand scale)
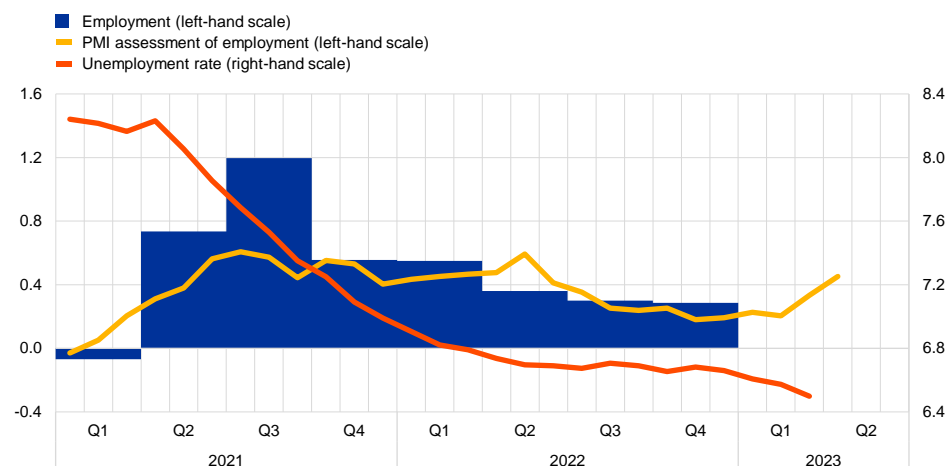
Sources: Eurostat, S&P Global Market Intelligence and ECB calculations.
Notes: The two lines indicate monthly developments; the bars show quarterly data. The PMI is expressed as the deviation from 50 divided by 10. The latest observations are for the fourth quarter of 2022 for employment, April 2023 for the PMI assessment of employment and March 2023 for the unemployment rate.

Short-term labour market indicators continue to point to a robust euro area labour market. The composite PMI employment indicator stood at 54.7 in April 2023. The reading of above 50 suggests further employment growth in the first and second quarters of the year. Looking at developments across sectors, the PMI employment indicator continues to signal strong employment growth in services, but shows signs of weakening in the manufacturing sector. The PMI indicator for employment in the construction sector has been in contractionary territory since April 2022.

Private consumption growth is likely to have been subdued in the first quarter of 2023. The negative dynamics of household consumption in the fourth quarter of 2022 were driven mainly by weak consumption of goods, while consumption of services remained broadly resilient, benefiting from lingering reopening effects. This dichotomy is likely to have continued in the first quarter of 2023. Elevated inflation continues to weigh on disposable income, while persistent uncertainty is dampening consumer spending. Retail sales figures in January and February suggest that spending on goods in the first quarter is likely to have contracted further. New passenger car registrations declined in the first quarter, largely on account of the withdrawal of purchase incentives for electric vehicles in Germany. By contrast, consumption of services is likely to have been more resilient in the first quarter, as suggested by the PMI for contact-intensive services, which remained solidly in expansionary territory. The European Commission's consumer confidence indicator continued its recovery in the first quarter of 2023 (Chart 8, left-hand panel), albeit from low levels, driven by an improvement in household expectations (Chart 8, right-hand panel). Incoming economic data point to improving, but still subdued, consumer spending. Consumer confidence improved further in April, but remained at low levels. While expectations for retail trade business activity deteriorated slightly, expected demand for accommodation, food and travel services remained resiliently

above its historical average, and expectations for consumer goods production recovered further. The ECB's Consumer Expectations Survey corroborates these findings, pointing to a low level of expected "big item" purchases but a rise in holiday bookings.

Household real disposable income declined in the fourth quarter of 2022, owing to elevated inflation in spite of the support from robust labour market dynamics. At the same time, the ratio of household savings to disposable income increased. While the further easing of economic uncertainty may reduce incentives to save, higher interest rates and tighter credit conditions are likely to encourage saving, thereby constraining consumption growth in the near term.

Chart 8

Household confidence, uncertainty and expectations
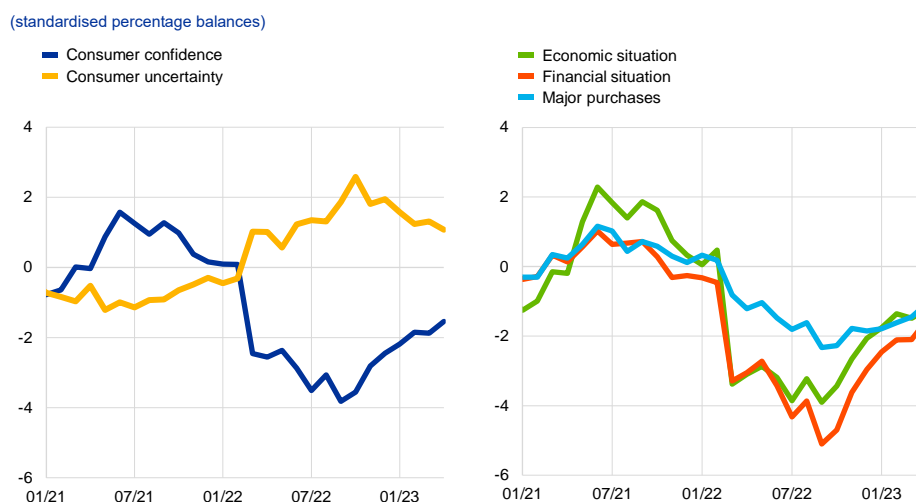
(standardised percentage balances)

- Consumer confidence
- Consumer uncertainty
- Economic situation
- Financial situation
- Major purchases

Sources: European Commission (Directorate-General for Economic and Financial Affairs) and ECB calculations.
Note: The latest observations are for April 2023.

Business investment is expected to have grown again in early 2023 following a contraction in the fourth quarter of 2022. Quarter-on-quarter headline non-construction investment fell by 5.8% in the fourth quarter of 2022. Excluding the strongly negative contribution from investment in intellectual property products in Ireland, it would have declined by 0.3% quarter on quarter.[3] Production up to February 2023 grew by 1.2% from the previous quarter and PMI output rose in the capital goods sector against a backdrop of easing supply disruptions and lower energy costs.[4] Meanwhile, the relative importance of internal corporate financing is increasing as the cost of borrowing rises and credit standards tighten. European Commission survey data show that, while remaining above historical averages, perceived limits to production in the capital goods sector diminished in the second

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[3]   See the box entitled "Intangible assets of multinational enterprises in Ireland and their impact on euro area GDP" in this issue of the Economic Bulletin.

[4]   Corporate contacts also report growth in the capital goods sector on the back of a reduction in supply disruption, see the box entitled "Main findings from the ECB's recent contacts with non-financial companies" in this issue of the Economic Bulletin.

quarter of 2023 compared with the previous quarter, as a result of the lower impact from factors related to space and/or equipment, as well as labour (Chart 9).

Chart 9

Limits to production in the capital goods sector

(changes in de-meaned percentage balances)
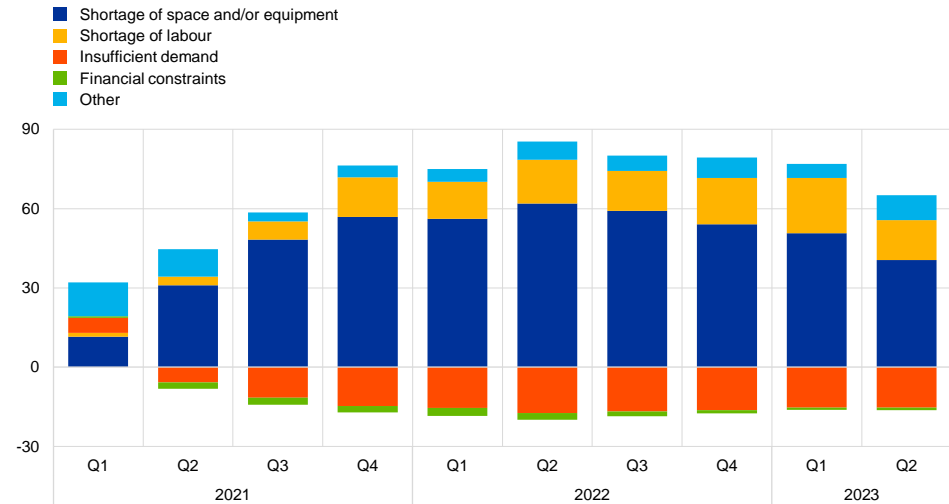
■ Shortage of space and/or equipment
■ Shortage of labour
■ Insufficient demand
■ Financial constraints
■ Other

Sources: European Commission (Directorate-General for Economic and Financial Affairs) and ECB calculations.
Notes: The net percentage balances have been adjusted for the average over the period 2000-19. The latest observations, referring to the second quarter of 2023, pertain to the release of data for April 2023.

Housing investment is expected to remain weak in the first half of 2023, amid some short-term volatility. Housing investment might have picked up in the first quarter of 2023, as suggested by the increase in building construction output in January and February by 3.7%, on average, compared with the fourth quarter of 2022. This reflects a strong base effect amid volatile weather conditions and a continued substantial backlog of orders. Nevertheless, the underlying momentum in housing investment remains subdued, reflecting protracted weakness in affordability (proxied by the average income needed for a mortgage payment on a typical home) and profitability (measured by the ratio of house prices to construction costs, known as Tobin's Q). While typically moving in opposite directions, driven by house price fluctuations, affordability and profitability both contracted at an unprecedented rate in the fourth quarter of 2022, owing to rising mortgage rates and construction costs respectively (Chart 10). This weak momentum in housing investment is likely to persist in the first half of 2023, as suggested by several indicators. The PMI for residential construction output remained in contractionary territory until March 2023. The European Commission's relevant index for recent trends in building construction activity continued to fall up to April, mainly as a result of weakening demand, growing labour shortages and tightening financial conditions, despite easing constraints in the supply of materials. The latest ECB Consumer Expectations Survey and Corporate Telephone Survey also suggest persistent expectations of high mortgage rates and

tight credit access for households despite some moderation in cost pressures for firms.[5]

Chart 10

Housing investment, affordability and profitability in the euro area

(year-on-year change, percentages)
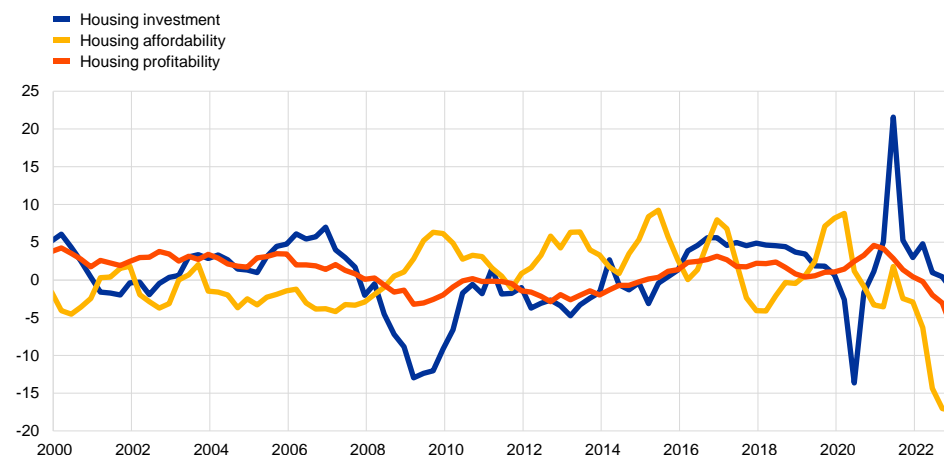
Sources: Eurostat and ECB calculations.
Notes: Housing profitability is the ratio of house prices to construction costs (proxied by the housing investment deflator), known as Tobin's Q. Housing affordability is computed in line with the methodology used by the US National Association of Realtors, as the ratio of average household income (proxied by household gross disposable income per capita) to average mortgage payments. The latter are calculated as the average payment on a 15-year mortgage at a constant interest rate (measured by the 10-year-plus mortgage rate) and the present value of the principal (proxied by house prices). The latest observations are for the fourth quarter of 2022.

The momentum in euro area exports remained subdued in the early months of the year, while imports continued to fall. The momentum in euro area goods exports slowed in February as the moderation in global trade outweighed the benefits from easing supply chain constraints. Moreover, empirical evidence suggests that higher energy costs may have affected export performance.[6] Imports declined further, in part driven by lower gas imports, as the weaker demand for gas reduced energy needs in the winter of 2022-23. Manufacturing imports also moderated, in line with the slowdown in euro area domestic demand. Looking ahead survey indicators point to a moderate pick-up in export prospects. They also suggest that suppliers' delivery times in the manufacturing industry have shortened further and that port congestion is easing rapidly across the world. However, while new manufacturing export orders have improved, they remain in contractionary territory, suggesting a somewhat moderate recovery in exports. The indicator for services export orders is more buoyant. In particular, tourism indicators are signalling a strong summer season ahead.

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[5]   For an assessment of the structural drivers of the decline in euro area housing investment and a comparison with the United States, see the box entitled "Monetary policy and housing investment in the euro area and the United States" in this issue of the Economic Bulletin.

[6]   See the box entitled "The energy shock, price competitiveness and euro area export performance" in this issue of the Economic Bulletin.

3 Prices and costs

According to the Eurostat flash estimate, inflation was 7.0% in April 2023, after having dropped from 8.5% in February to 6.9% in March. Inflation rates for food and non-energy industrial goods (NEIG) decreased, while the rate for services saw a small further increase. Price pressures remained strong across all sectors, with the effects of high energy costs, supply bottlenecks and the reopening of the economy continuing to feed through. This was mirrored in the latest available data for indicators of underlying inflation, which remained high. Meanwhile, data for the fourth quarter of 2022 indicate that wage pressures continued to strengthen in that quarter, with some sectors seeing increased profit margins. Although most measures of longer-term inflation expectations currently stand at around 2%, some indicators have edged up and warrant continued monitoring.

Headline inflation in the euro area, as measured by the Harmonised Index of Consumer Prices (HICP), was 7.0% in April, after having dropped from 8.5% in February to 6.9% in March. The rise in April was driven by an increase in energy inflation, which rose from -0.9% to 2.5% over the same period. Meanwhile, food inflation fell to 13.6% in April, down from 15.5% in March, and HICP inflation excluding energy and food (HICPX) stood at 5.6%, down slightly from 5.7% in March. These figures remain high, suggesting that earlier surges in energy input costs and past supply bottlenecks are still feeding through. While NEIG inflation fell slightly to stand at 6.2% in April, services inflation increased to 5.2% (up from 5.1% in March), probably still being driven by pent-up demand from the reopening of the economy and rising wages (Chart 11).

Chart 11
Headline inflation and its main components

(annual percentage changes; percentage point contributions)
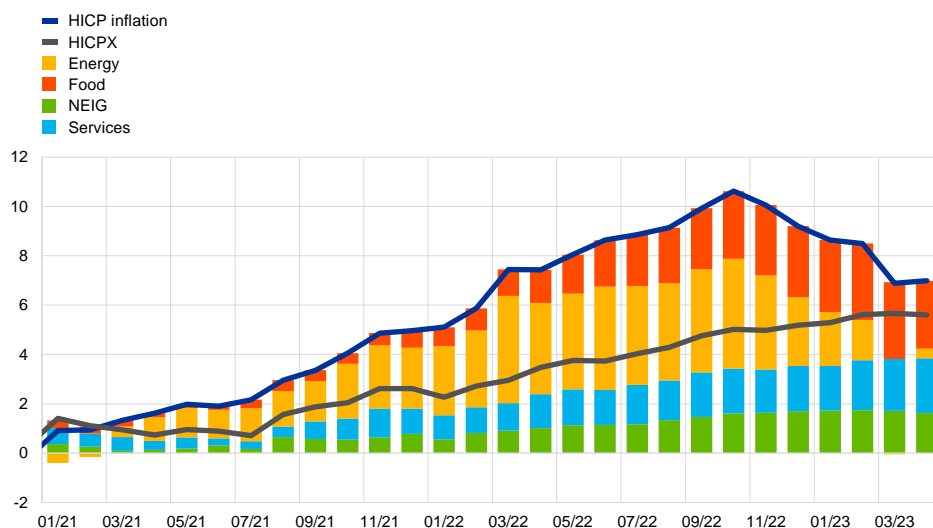
Sources: Eurostat and ECB calculations.
Note: The latest observations are for April 2023 (flash estimates).

April's increase in energy inflation reflected an upward base effect, while energy prices declined further in month-on-month terms. Annual energy inflation

increased in most of the five largest euro area countries, with heterogeneity across those countries remaining considerable on account – among other things – of differences in energy production mixes, contract and consumption patterns, regulatory approaches and government support measures. Pipeline pressures for energy prices have continued to fall, with annual growth in energy producer prices standing at 17.3% in February 2023, down from a peak of 117.3% in August 2022 (Chart 12).

April saw food inflation in the euro area decline for the first time since September 2021, with lower annual rates for both unprocessed and processed food. It stood at 13.6% in that month, down from 15.5% in March, with annual growth in unprocessed food prices standing at 10.0% (down from 14.7% in March) on account of a sizeable month-on-month decline in prices. The decline observed for unprocessed food probably reflected a downward correction following two months of strong price increases. At the same time, the annual growth rate of processed food prices also declined, standing at 14.7% in April, down from 15.7% in March, mainly reflecting a downward base effect (as prices for processed food rose further in month-on-month terms). This decline suggests that the accumulated cost pressures on food prices as a result of prices for energy and food inputs may have started to recede (Chart 12).

Chart 12

HICP food prices, energy and food input costs

(annual percentage changes)

- Producer price index – energy
- Euro area farm gate prices
- Producer price index – manufacturing of food products (right-hand scale)
- HICP food (right-hand scale)
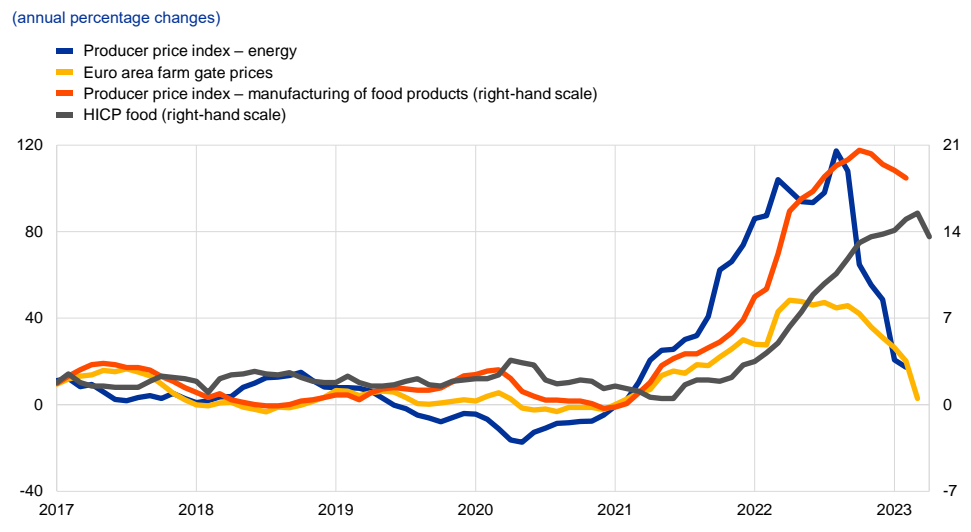
Source: Eurostat.
Note: The latest observations relate to April 2023 (flash estimate) for HICP food, March 2023 for euro area farm gate prices and February 2023 for the remaining items.

Most indicators of underlying inflation in the euro area remained at elevated levels (Chart 13). At the same time, heterogeneity in the levels of the various measures remained considerable, pointing to uncertainty surrounding the dynamics of underlying inflation. While HICPX data are available for April, other measures of underlying inflation only include data up to March and have been sending mixed signals. Exclusion-based indicators such as HICPXX (i.e. HICPX minus volatile travel, footwear and clothing-related items) and the domestic inflation indicator

(which excludes items with a high import content) remained broadly unchanged in March, as did the Supercore indicator (which comprises cyclically sensitive HICP items). However, exclusion-based measures of underlying inflation tend to be reported in terms of year-on-year growth rates, so their signals may involve a lag. The model-based Persistent and Common Component of Inflation (PCCI) measure, which is expressed in terms of an annualised rate, declined in March (regardless of whether energy is included). More generally, the short-term growth rates of several indicators of underlying inflation, measured in terms of month-on-month or quarter-on-quarter developments, have started to point to some moderation in price pressures. Such a moderation in measures of underlying inflation would be consistent with the notion that these measures include indirect effects of the past energy price surge which are now gradually unwinding, with energy price developments having moderated for several months now.

Chart 13

Indicators of underlying inflation

(annual percentage changes)
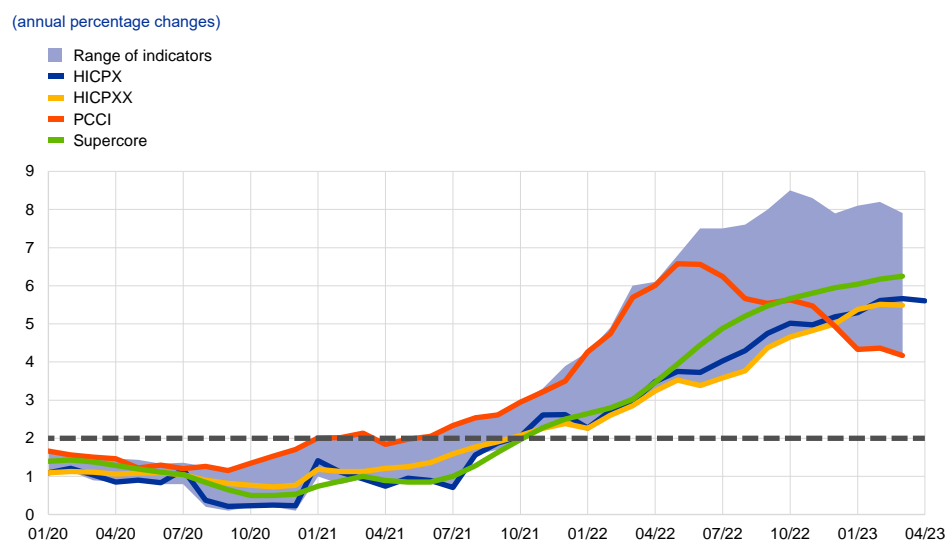
Sources: Eurostat and ECB calculations.
Notes: The range of indicators of underlying inflation includes HICP excluding energy, HICP excluding energy and unprocessed food, HICPX, HICPXX, 10% and 30% trimmed means, PCCI and a weighted median. The grey dashed line represents the ECB's inflation target of 2% over the medium term. The latest observations relate to April 2023 (flash estimate) for HICPX and March 2023 for the rest.

With energy costs becoming less prominent, developments in wages and other labour costs are increasingly becoming a factor in the persistence of underlying inflation in the euro area. The latest available data point to a strengthening of wage pressures, with annual growth in negotiated wages standing at 2.9% in the third and fourth quarters of 2022, up from 2.5% in the second quarter. Actual wage growth, as measured in terms of compensation per employee and compensation per hour, increased markedly in the fourth quarter of 2022, with the annual growth rates of those two measures of wages rising to 5.0% and 4.3% respectively, up from 3.9% and 2.9% respectively in the third quarter. Wage negotiations concluded in recent months suggest that wage pressures have continued to strengthen in 2023. The extent to which these pressures will feed through into the dynamics of underlying inflation will depend on developments in

profit margins, with aggregate national accounts data for the fourth quarter of 2022 pointing to a strengthening of the pressures coming from this source.

Inflation for non-energy industrial goods fell to 6.2% in April, down from 6.6% in March. Looking at early stages of the pricing chain, producer price inflation for intermediate goods and import price inflation for intermediate goods both declined strongly further in February. Looking at later stages of the pricing chain, producer price inflation for non-food consumer goods edged downward to stand at 8.6% in February, down from 8.8% in January – the second consecutive month with a decline in annual terms. While annual growth rates for import prices and producer prices have been easing, they remain elevated, indicating cumulative pipeline pressures that could keep consumer price inflation for NEIG high for some time (Chart 14).

Chart 14
Indicators of pipeline pressures
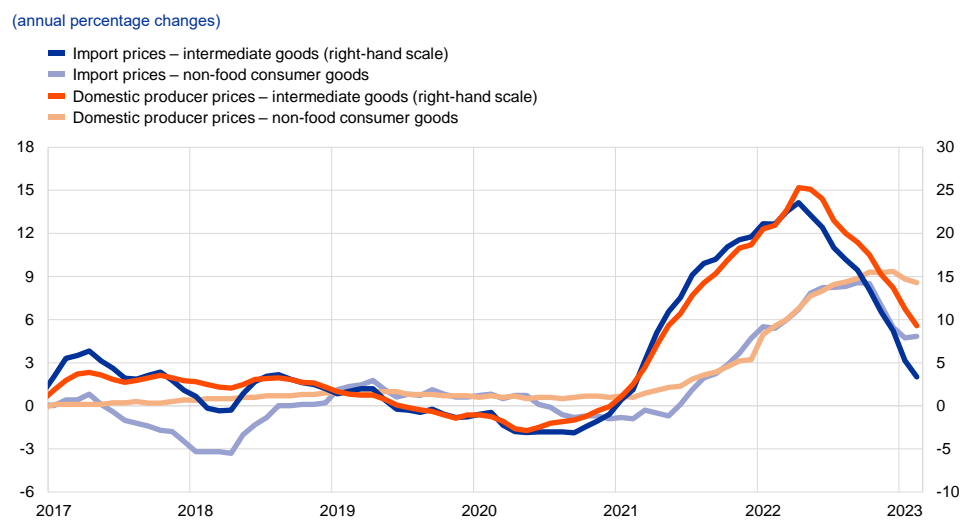
(annual percentage changes)
- Import prices – intermediate goods (right-hand scale)
- Import prices – non-food consumer goods
- Domestic producer prices – intermediate goods (right-hand scale)
- Domestic producer prices – non-food consumer goods

Sources: Eurostat and ECB calculations.
Note: The latest observations are for February 2023.

Most survey-based indicators of longer-term inflation expectations in the euro area remain more or less unchanged at around 2%, broadly in line with market-based measures of inflation compensation (Chart 15). In the ECB Survey of Professional Forecasters (SPF) for the second quarter of 2023, average longer-term inflation expectations (for 2027) were unchanged at 2.1%. In the April 2023 Consensus Economics survey, inflation expectations for 2027 increased to 2.1% (up from 2.0% in January). In the March 2023 ECB Survey of Monetary Analysts, median longer-term expectations remained unchanged at 2.0%. When combined with shorter-term expectations, these data suggest that survey participants expect a rapid decline in inflation and point to the anchoring of longer-term expectations. In the ECB Consumer Expectations Survey for March 2023, median expectations three years ahead rose to 2.9%, up from 2.4% in February.[7] Overall, market-based measures of inflation compensation (which are based on HICP

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[7]   See "ECB Consumer Expectations Survey results – March 2023", press release, ECB, Frankfurt am Main, 11 May 2023.

excluding tobacco) remained broadly unchanged over the review period at the short end, while increasing at the long end amid an easing of concerns about the recent turmoil in the banking sector. At the short end, the one-year forward inflation-linked swap rate one year ahead stood at around 2.2% in early May, broadly unchanged from the start of the review period in mid-March. As regards long-term rates, the five-year forward inflation-linked swap rate five years ahead ended the review period slightly higher, standing at around 2.4% in early May, having peaked at almost 2.5% during that period. However, it should be noted that market-based measures of inflation compensation are not a direct gauge of market participants' genuine inflation expectations, given that these measures include inflation risk premia which compensate for inflation risks.

Chart 15

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

(annual percentage changes)

- HICP
- ECB staff macroeconomic projections (March 2023)
- Consensus Economics (April 2023)
- Market-based measures of inflation compensation (2 May 2023)
- SPF Q2 2023
- SPF Q1 2023
- SPF Q4 2022
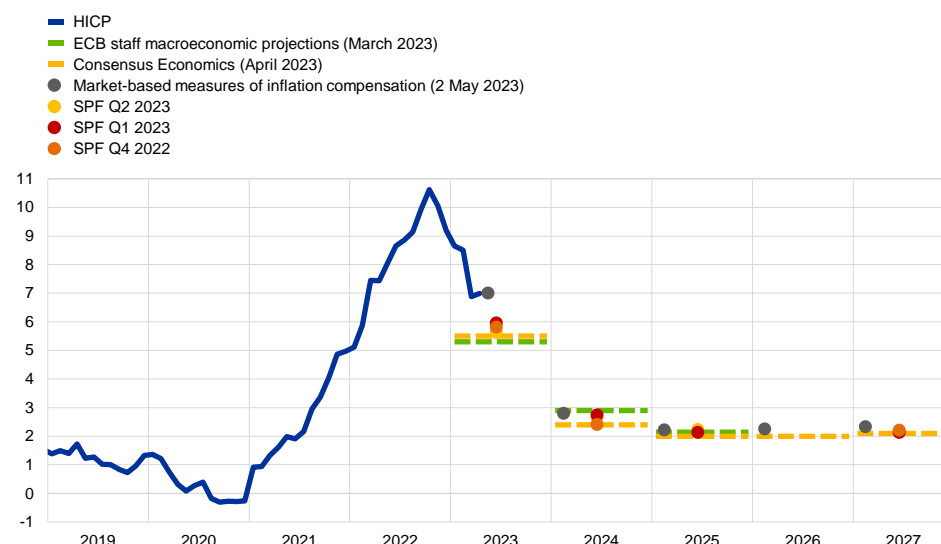
Sources: Eurostat, Refinitiv, Consensus Economics, Survey of Professional Forecasters, ECB staff macroeconomic projections for the euro area, March 2023, and ECB calculations.
Notes: The market-based measures of inflation compensation series is based on the one-year spot inflation rate, the one-year forward rate one year ahead, the one-year forward rate two years ahead and the one-year forward rate three years ahead. The observations for market-based measures of inflation compensation relate to 2 May 2023. The ECB Survey of Professional Forecasters for the second quarter of 2023 was conducted between 31 March and 5 April 2023. The cut-off for the Consensus Economics long-term forecasts was April 2023. The cut-off date for data included in the ECB staff macroeconomic projections was 2 March 2023. The latest observation for HICP relates to April 2023 (flash estimate).

There are still significant upside risks to the inflation outlook. In the near term, existing pipeline pressures could send retail prices higher than expected, while Russia's war against Ukraine could push energy and food prices up again. Over the medium term, inflation expectations that are persistently higher than the ECB's target could also drive inflation up, as could larger than anticipated increases in wages or profit margins. Moreover, recent negotiated wage agreements have added to the upside risks to inflation, and those risks will be exacerbated if profit margins remain high. Downside risks include the potential for renewed financial market tensions, which could bring inflation down faster than projected. A weakening of demand – on account, for example, of a more marked slowdown in bank lending or stronger

transmission of monetary policy – would also result in price pressures being weaker than is currently anticipated, especially over the medium term.

4 Financial market developments

During the review period (16 March to 3 May 2023), financial market developments were driven largely by waning concerns about the banking sector turmoil seen in early March, as well as by the Governing Council's monetary policy decisions that month. Market expectations for euro area policy rates rose over the review period but remained lower than prior to the banking turmoil, i.e. before the broad-based sell-off in risk assets sparked by difficulties experienced by some US regional banks. Sovereign bond yields in the euro area ended the review period broadly unchanged, remaining below their pre-turmoil levels, with stable sovereign spreads. Overall, euro area risk assets improved, despite experiencing initial volatility on the back of the banking sector turmoil: euro area corporate bond spreads narrowed across segments, and equity markets – apart from bank stocks – moved somewhat higher. In both cases, this represents a general unwinding of the movement that had occurred during the turmoil. In foreign exchange markets, the euro strengthened overall in trade-weighted terms.

Euro area near-term risk-free rates rose following the Governing Council's March 2023 meeting, as market participants revised their policy rate expectations upwards, but still remained below their pre-turmoil level. Over the review period, the euro short-term rate (€STR) averaged 284 basis points, that average having risen from 240 basis points between 16 March and 21 March to 290 basis points after 22 March, i.e. during the reserve maintenance period that followed the ECB's interest rate hike in March. Excess liquidity was stable, increasing by approximately €31 billion to €4,096 billion. The initial reaction of risk-free rates to the Governing Council's monetary policy decisions in March was relatively muted across maturities. Thereafter, the overnight index swap (OIS) forward curve, based on the benchmark €STR, rose for short-term maturities, reflecting market participants' waning concerns about the banking sector and their shift in focus back towards global activity and inflation. At the end of the review period, the OIS forward curve had priced in rate hikes of 34 basis points and 16 basis points for the May and June Governing Council meetings respectively, as well as further rate increases amounting cumulatively to 30 basis points. This implies a peak rate of approximately 3.7% by the end of 2023, which is below the peak rate that had prevailed on 6 March, just before the start of the risk asset sell-off sparked by difficulties at some US regional banks.

Long-term sovereign bond yields ended the review period broadly unchanged, standing below their level prior to the banking sector turmoil in early March (Chart 16). The euro area GDP-weighted average ten-year sovereign bond yield stood at around 2.9%, seeing little change over the review period and remaining somewhat below its level prior to the turmoil. Ten-year sovereign bond yields in the euro area generally moved in line with long-term risk-free rates, resulting in a stable spread over the euro area OIS rate of around 0.2 percentage points. Outside the euro area, the ten-year US sovereign bond yield decreased by 21 basis points, to stand at 3.4%, while the UK sovereign bond yield increased by 26 basis points, standing at 3.7%.

Chart 16

Ten-year sovereign bond yields and the ten-year OIS rate based on the €STR

(percentages per annum)

- GDP-weighted euro area average
- Euro area OIS rate
- United Kingdom
- United States
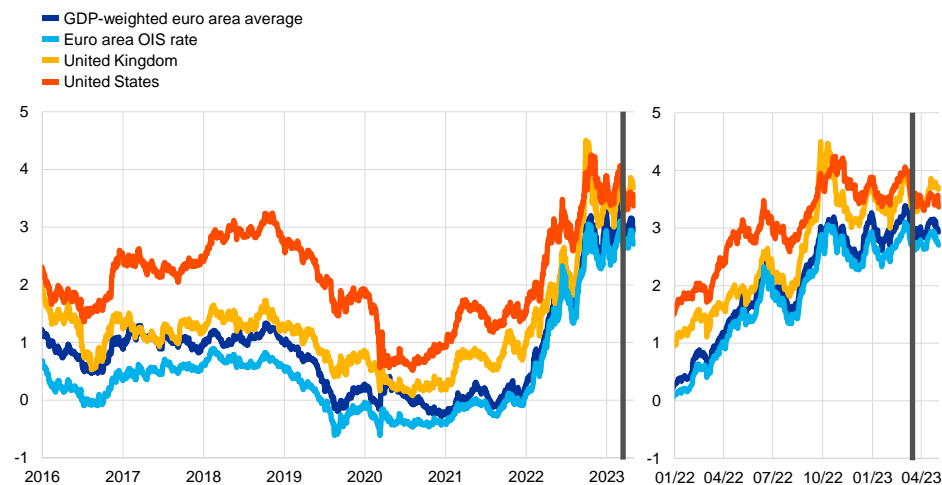
Sources: Refinitiv and ECB calculations.
Notes: The vertical grey line denotes the start of the review period on 16 March 2023. The latest observations are for 3 May 2023.

Corporate bond spreads narrowed, despite widening initially on the back of the banking sector turmoil in early March. In the first few days of the review period, corporate bond spreads were highly volatile, driven primarily by bonds in the financial corporation and high-yield segments. By the end of March this volatility had abated, and spreads narrowed smoothly thereafter, leading to an overall decrease over the review period. Specifically, spreads on high-yield and investment-grade corporate bonds both fell by around 20 basis points. Within the investment-grade segment, spreads on financial corporate bonds narrowed the most, by 22 basis points, ending the review period slightly higher than prior to the banking turmoil, while those on non-financial corporate bonds declined by 17 basis points, ending the review period slightly lower than prior to the turmoil.

Euro area equity markets rose, and forward-looking measures of volatility decreased. Euro area equity prices picked up and forward-looking measures of stock market volatility decreased from the six-month high seen during the banking turmoil in early March. Overall, equity prices of non-financial corporations (NFCs) rose by around 3.8%, while the equity prices of euro area banks increased more modestly, by around 1.2%, to stand significantly below their pre-turmoil levels. In the United States, NFC equity prices went up by around 3.5% over the review period, while bank equity prices weakened by around 4.3%.

In foreign exchange markets, the euro strengthened overall in trade-weighted terms (Chart 17). During the review period the nominal effective exchange rate (EER) of the euro – as measured against the currencies of 41 of the euro area's most important trading partners – appreciated by 2.5%. In terms of bilateral exchange rate developments against major currencies, the euro appreciated against the US dollar (by 4.2%), amid rising interest rate differentials and easing financial market tensions, and also against the Japanese yen (by 6.8%) and the pound sterling (by 0.5%). The euro likewise strengthened against the Chinese renminbi (by

4.5%) and against the currencies of other major emerging economies, but depreciated against the currencies of some non-euro area EU countries.

Chart 17

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

(percentage changes)

- Since 16 March 2023
- Since 3 May 2022

EER-41
Chinese renminbi
US dollar
Pound sterling
Swiss franc
Japanese yen
Polish zloty
Czech koruna
Turkish lira
South Korean won
Indonesian rupiah
Hungarian forint
Danish krone
Romanian leu
Taiwan dollar
Brazilian real
Indian rupee

-8   -4   0   4   8   12   16   20   24   28   32   36   40
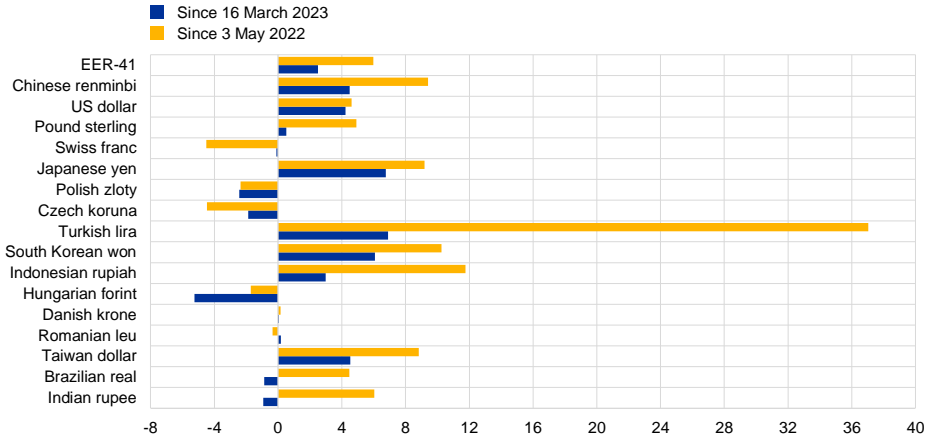
Source: ECB.
Notes: EER-41 is the nominal effective exchange rate of the euro against the currencies of 41 of the euro area's most important trading partners. A positive (negative) change corresponds to an appreciation (depreciation) of the euro. All changes have been calculated using the foreign exchange rates prevailing on 3 May 2023.

5 Financing conditions and credit developments

The funding cost of banks increased significantly over the first quarter of 2023, with bank bond spreads widening during the financial market turmoil in March. In February 2023 bank lending rates rose further, reflecting the increases in the key European Central Bank (ECB) interest rates. Over the period from 16 March to 3 May 2023 both firms' cost of equity financing and the cost of market-based debt financing declined slightly. Bank lending to firms and households continued to moderate in March amid higher interest rates, weaker demand and tighter credit standards. In the most recent bank lending survey, euro area banks reported a further substantial tightening of their credit standards, above expectations, and a strong decline in loan demand from firms and households, pointing to a persistent weakening of loan dynamics. Monetary dynamics remained subdued in March 2023, driven by their most liquid components and slower credit growth.

The funding costs of euro area banks continued to increase in February, reflecting movements in market rates and higher deposit rates. Owing to lags in the available data on deposit rates, the composite cost of debt financing of euro area banks as of 3 May (the cut-off date for this document) could only be calculated up to February. The indicator increased further and stood at its highest level for ten years (Chart 18, panel a). Bank bond yields increased by 48 basis points since the beginning of 2023 (Chart 18, panel b) and bank bond spreads widened sharply during the market turmoil in mid-March 2023, especially for more subordinated bonds and in particular Additional Tier 1 (AT1) instruments. Despite some reversion of the initial increase, spreads remain significantly above those observed before the turmoil. The cost of deposits maintained its steady rising path, albeit with heterogeneity observed across types of products. Time deposit rates are adjusting swiftly to policy rate changes, while overnight deposit rates remain more sluggish. While depositors are reacting to this widening spread by shifting from overnight to time deposits, the former still make up a large share of the deposit base. As a result, the spread between composite deposit and policy rates continues to widen, as observed during past interest rate hiking cycles.

Banks' repayments of funds borrowed under the third series of targeted longer-term refinancing operations (TLTRO III) also contributed to higher bank funding costs. Since the recalibration of the TLTRO III terms and conditions, which came into effect on 23 November 2022, banks have made sizeable (both mandatory and, in particular, voluntary) repayments of funds borrowed under the programme. A total of €1.015 trillion has been repaid, reducing outstanding amounts by around 48%.[8] Furthermore, banks have increased the issuance of bonds, which are remunerated above deposit and policy rates, amid the winding-down of TLTROs and the decline in deposits. Bank bond issuance has increased by almost €170 billion since September 2022, while deposits decreased by around €200 billion over the same period.

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[8] See "ECB recalibrates targeted lending operations to help restore price stability over the medium term", *Press Release*, ECB, Frankfurt am Main, 27 October 2022.

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Chart 18

Composite bank funding rates in selected euro area countries

(annual percentages)

- Euro area
- Germany
- France
- Italy
- Spain

a) Banks' composite cost of debt financing

b) Bank bond yields
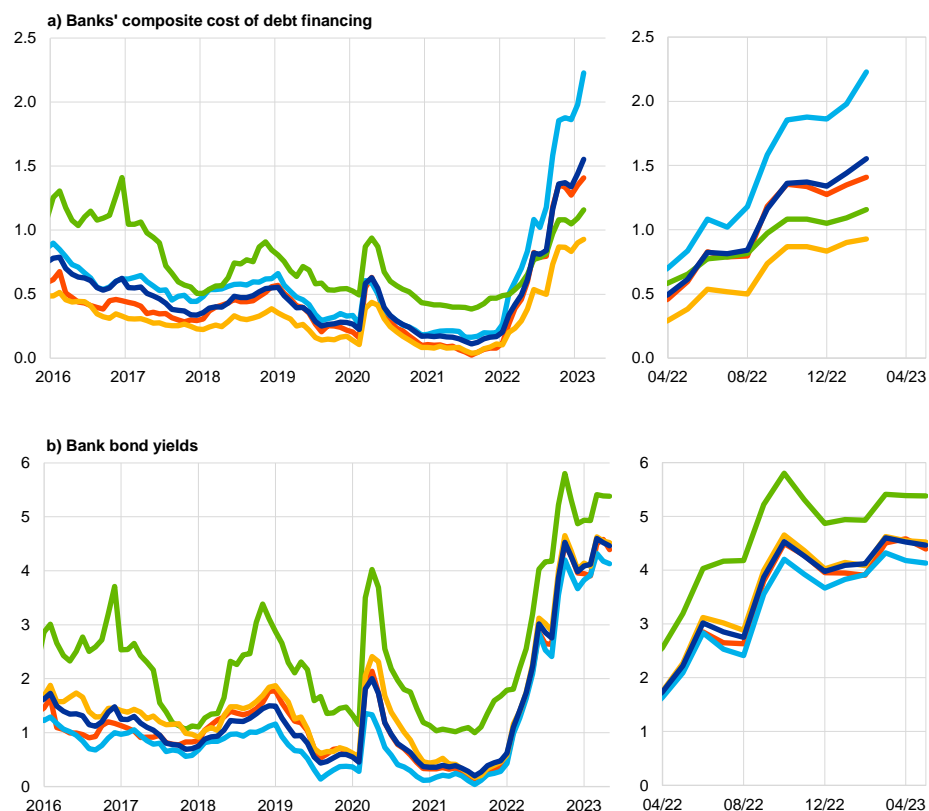
Sources: ECB, I Markit iBoxx indices and ECB calculations.
Notes: Composite bank funding rates are a weighted average of the composite cost of deposits and unsecured market-based debt financing. The composite cost of deposits is calculated as an average of new business rates on overnight deposits, deposits with an agreed maturity and deposits redeemable at notice, weighted by their respective outstanding amounts. Bank bond yields are monthly averages for senior-tranche bonds. The latest observations are for February 2023 for composite bank funding rates and 3 May 2023 for bank bond yields.

Bank lending rates for firms and households rose further in February 2023, reflecting the increases in the key ECB interest rates. Changes in the ECB's monetary policy measures are being transmitted to bank lending conditions, with banks' rates increasing and credit standards tightening, as described below. Bank lending rates for loans to non-financial corporations (NFCs) increased further to 3.85% in February, compared with 3.63% in January and 1.55% in May 2022. Bank lending rates for loans to households for house purchase also rose further to stand at 3.24% in February, compared with 3.10% in January and 1.78% in May 2022. These increases were faster than in previous hiking cycles, mainly reflecting the faster pace of policy rate hikes. Results from the February 2023 Consumer Expectations Survey suggest that consumers expect mortgage rates to increase further over the next 12 months. They also expect it to become harder to obtain housing loans. The spread between bank lending rates on small and large loans increased somewhat in February, reflecting country heterogeneity, but remained low

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in a historical context. The cross-country dispersion of lending rates to firms and
households remained broadly stable (Chart 19, panels a and b).

Chart 19

Composite bank lending rates for NFCs and households in selected countries

(annual percentages; standard deviation)

- Euro area
- Germany
- France
- Italy
- Spain
- Cross-country standard deviation (right-hand scale)

a) Rates on loans to NFCs

b) Rates on loans to households for house purchase
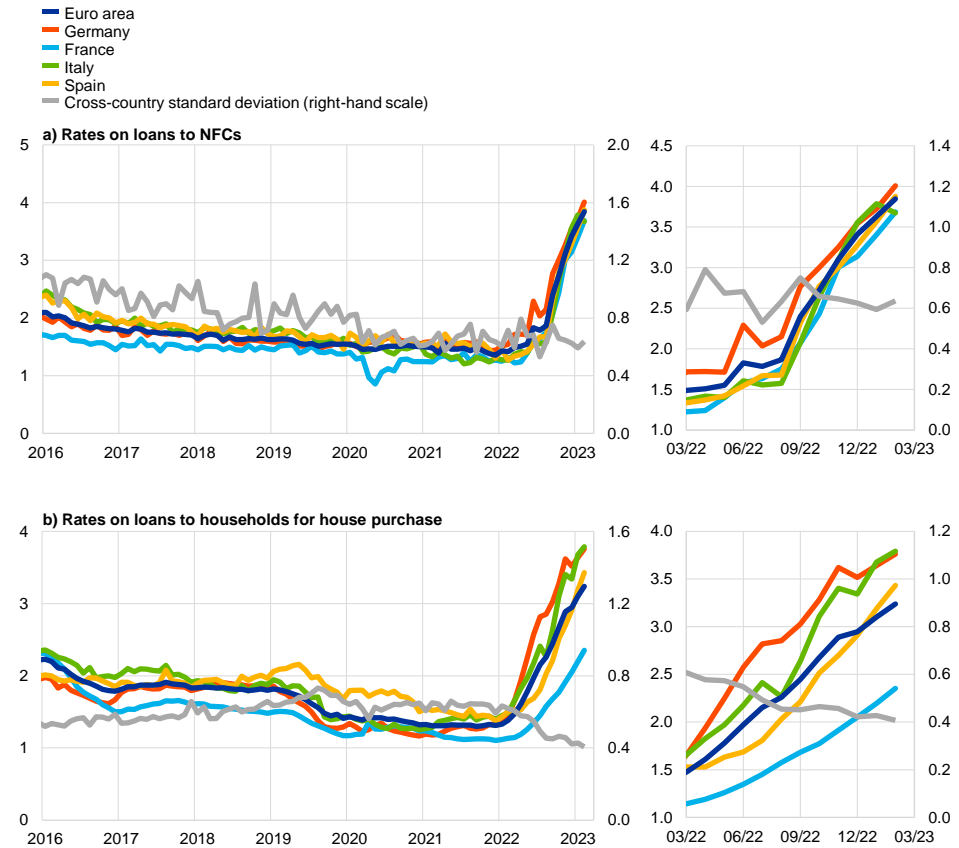
Source: ECB.
Notes: Composite bank lending rates are calculated by aggregating short and long-term rates using a 24-month moving average of
new business volumes. The cross-country standard deviation is calculated using a fixed sample of 12 euro area countries. The latest
observations are for February 2023.

**Over the period from 16 March to 3 May 2023 both the cost of equity financing
for NFCs and the cost of market-based debt declined slightly.** Owing to lags in
the available data on the cost of borrowing from banks, as of 3 May the overall cost
of financing for NFCs – that is, the composite cost of bank borrowing, market-based
debt and equity – could only be calculated up to February 2023, when it stood at
5.9%, almost unchanged from its level in the previous month (Chart 20). This was
the result of a decline in the cost of equity financing compensating for a rise in the
cost of market-based debt – mostly owing to the increase in the risk-free rates as
corporate bond spreads were little changed – and the increase in the cost of both
short and long-term bank debt. While decreasing slightly from its October 2022 peak,
in February 2023 the overall cost of financing remained close to the elevated levels
last seen at the end of 2011. Over the review period the cost of market-based debt
declined slightly, owing to broadly stable risk-free rates combined with a sizeable
compression in the spreads on corporate bonds issued by non-financial firms for
both investment-grade and, more noticeably, high-yield segments. As long-term risk-

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free rates remained virtually stable, the cost of equity mirrored the developments in the equity risk premium, which declined over the review period.

Chart 20

Nominal cost of external financing for euro area NFCs, broken down by component

(annual percentages)

- Overall cost of financing
- Cost of equity
- Cost of market-based debt
- Short-term cost of bank borrowing
- Long-term cost of bank borrowing
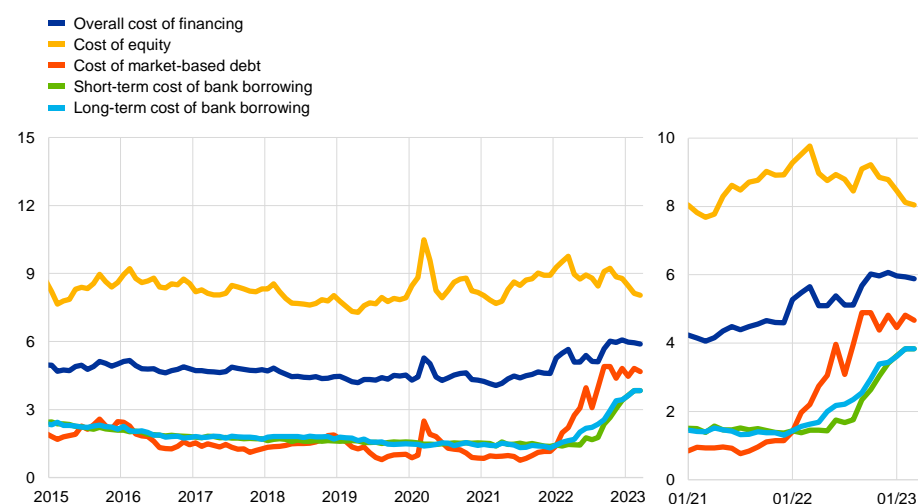
Sources: ECB and ECB estimates, Eurostat, Dealogic, Merrill Lynch, Bloomberg and Thomson Reuters.
Notes: The overall cost of financing for NFCs is calculated as a weighted average of the cost of borrowing from banks, market-based debt and equity, based on their respective outstanding amounts. The latest observations are for 3 May 2023 for the cost of market-based debt (monthly average of daily data), 28 April 2023 for the cost of equity (weekly data) and 28 February 2023 for the overall cost of financing and the cost of borrowing from banks (monthly data).

According to the April 2023 euro area bank lending survey**, credit standards for loans to firms and to households for house purchase showed a further substantial tightening in the first quarter of 2023, pointing to a persistent weakening of loan dynamics (Chart 21).** The tightening was stronger than banks had expected in the previous quarter and, from a historical perspective, its pace for firms remained the strongest seen since the euro area sovereign debt crisis in 2011. In an environment of increased uncertainty, the main factors underlying the tightening of credit standards for firms and households were higher risk perceptions related to the economic outlook and, to a lesser extent, lower risk tolerance by banks. Against the backdrop of increases in the key ECB interest rates and decreases in central bank liquidity, banks' cost of funds and balance sheet conditions also had a tightening impact on credit standards for loans to euro area firms. For the second quarter of 2023 banks expect a further, though more moderate tightening of credit standards on loans to firms and households.

Banks reported a strong decrease in loan demand from firms and households in the first quarter of 2023. The decline in loan demand from firms was the strongest since the global financial crisis, while that of households was the largest since the start of the survey in 2003. The decline in loan demand from firms and households was stronger than expected by banks in the previous quarter. Banks reported that the general level of interest rates was the main driver of reduced loan demand, in an environment of monetary policy tightening. Falling financing needs for fixed investment also had a strong dampening effect on loan demand from firms. The decrease in the demand for housing loans remained strong and was mainly driven

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by rising interest rates, weakening housing market prospects and low consumer confidence. For the second quarter of 2023 banks expect a further, albeit smaller (net) decrease in loan demand from firms and households.

Chart 21

Changes in credit standards and net demand for loans to NFCs and to households for house purchase

(net percentages of banks reporting a tightening of credit standards or an increase in loan demand)
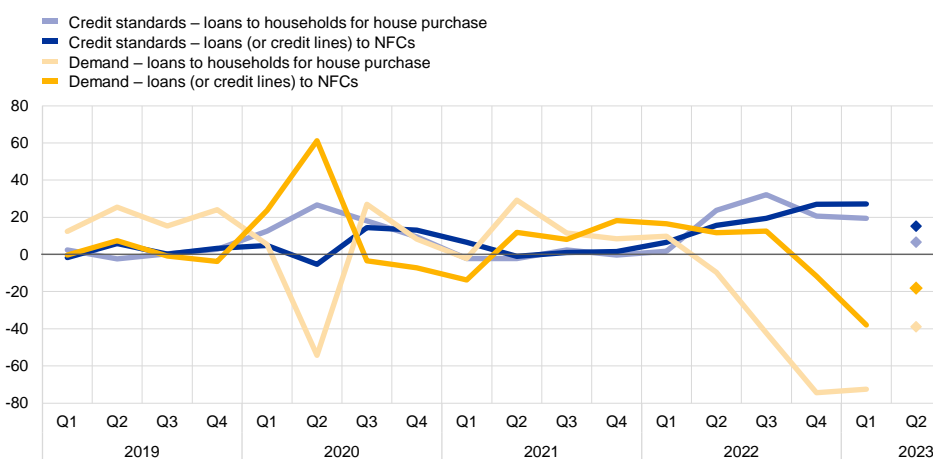
Source: Euro area bank lending survey.
Notes: For survey questions on credit standards, "net percentages" are defined as the difference between the sum of the percentages of banks responding "tightened considerably" and "tightened somewhat" and the sum of the percentages of banks responding "eased somewhat" and "eased considerably". For survey questions on demand for loans, "net percentages" are defined as the difference between the sum of the percentages of banks responding "increased considerably" and "increased somewhat" and the sum of the percentages of banks responding "decreased somewhat" and "decreased considerably". The diamonds denote the expectations reported by banks in the current round. The latest observations are for the first quarter of 2023.

Furthermore, banks expect that the ECB's non-standard monetary policy measures will contribute to weakening lending dynamics due to their effect on banks' funding and liquidity positions. Banks' access to retail and wholesale funding deteriorated in the first quarter of 2023, possibly reflecting the March 2023 market turmoil and reversing the improvement in the access to these markets registered at the end of last year. Banks indicate that the winding-down of the ECB's monetary policy asset portfolio and the phasing-out of TLTRO III has also had a negative impact on their market financing conditions and liquidity positions over the last six months. In addition to the impact from higher policy rates and increased risk aversion, repayments of funds borrowed under TLTRO III are contributing to a reduction in lending volumes, as credit standards tighten further. Meanwhile, banks reported that the impact of the key ECB interest rate decisions on their net interest margins was markedly positive, whereas the impact on bank profitability via their non-interest income was negative. Moreover, banks reported a dampening impact on profitability via higher provisions and impairments, which may reflect higher credit risk as monetary policy tightening dampens economic activity and increases the interest burden of borrowers.

Bank lending to firms and households continued to moderate in March amid higher interest rates, weaker demand and tighter credit standards. The annual growth rate of loans to NFCs declined to 5.2% in March, from 5.7% in February (Chart 22, panel a). This slowdown was widespread across the largest economies

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and reflects the higher interest rates, the strong decrease in loan demand and the further substantial tightening of credit standards. The annual growth rate of loans to households also continued to moderate, edging down from 3.2% in February to 2.9% in March (Chart 22, panel b) amid deteriorating housing market prospects, a substantial further tightening of banks' credit standards and higher lending rates. It was mainly driven by the ongoing decline in the growth of housing loans, but since the beginning of 2023 other loans to households, and in particular those granted to sole proprietors (i.e. unincorporated small businesses), have shown substantial negative net flows and therefore also contributed to the weakening.

Chart 22

MFI loans in selected euro area countries

(annual percentage changes; standard deviation)

- ■ Euro area
- ■ Germany
- ■ France
- ■ Italy
- ■ Spain
- ■ Cross-country standard deviation (right-hand scale)
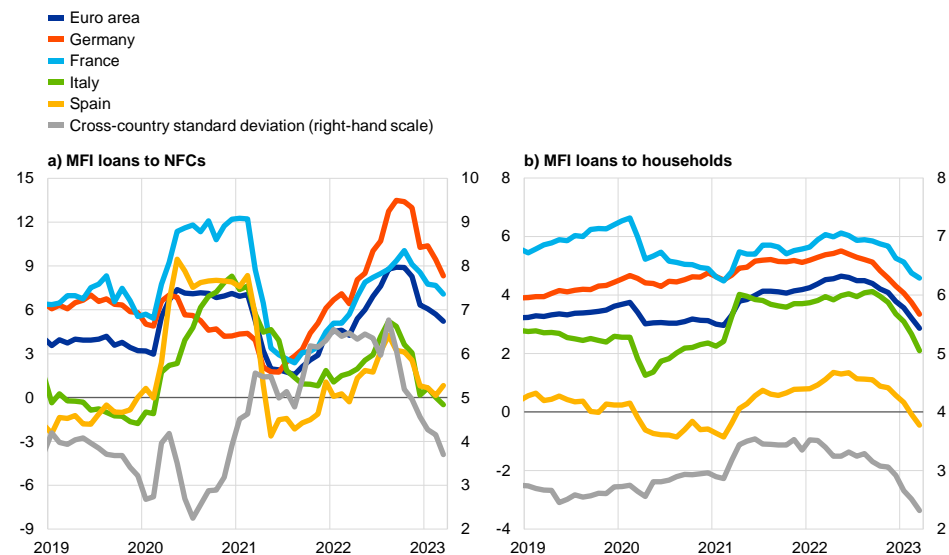
Source: ECB.
Notes: Loans from monetary financial institutions (MFIs) are adjusted for loan sales and securitisation; in the case of NFCs, loans are also adjusted for notional cash pooling. The cross-country standard deviation is calculated using a fixed sample of 12 euro area countries. The latest observations are for March 2023.

Overnight deposits contracted strongly in March, driven by the reallocation of funds to instruments with a higher remuneration, in particular time deposits but also non-bank financial instruments. The annual growth rate of overnight deposits declined to -5.1% in March, from -3.5% in February. The sharp decline in the growth of overnight deposits and therefore also in the narrow monetary aggregate M1 is the strongest contraction observed since the start of the Economic and Monetary Union in 1999 (Chart 23). After recording its first negative annual growth rate in January (-0.8%), M1 growth has continued to weaken, declining from -2.7% in February to -4.2% in March. This is especially owing to the large-scale substitution of overnight deposits with time deposits, but it also reflects the shift to bank bonds and, to a lesser extent, money market fund shares. The absence of a material increase in currency in circulation suggests that there was no widespread decrease in the public's trust in euro area banks following the March turmoil. This pattern of portfolio rebalancing was also observed in previous tightening cycles, as the remuneration of overnight deposits adjusts sluggishly to policy rate changes. The remuneration of time deposits and market-based instruments, however, adjusts

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faster, leading to a widening of interest rate spreads, which in turn creates incentives for portfolio reallocation. The strong shift away from overnight deposits in the current tightening cycle can be explained by the following main factors. First, the pace of the ECB's policy tightening is faster than in previous tightening cycles, leading to a sharp widening of the spread between overnight and time deposits. Second, the accumulated share of overnight deposits was exceptionally large after the period of low interest rates and the COVID-19 pandemic. Third, the sharp weakening of lending dynamics dampens overall money creation.

Chart 23

M3, M1 and overnight deposits

(annual growth rate, adjusted for seasonal and calendar effects)
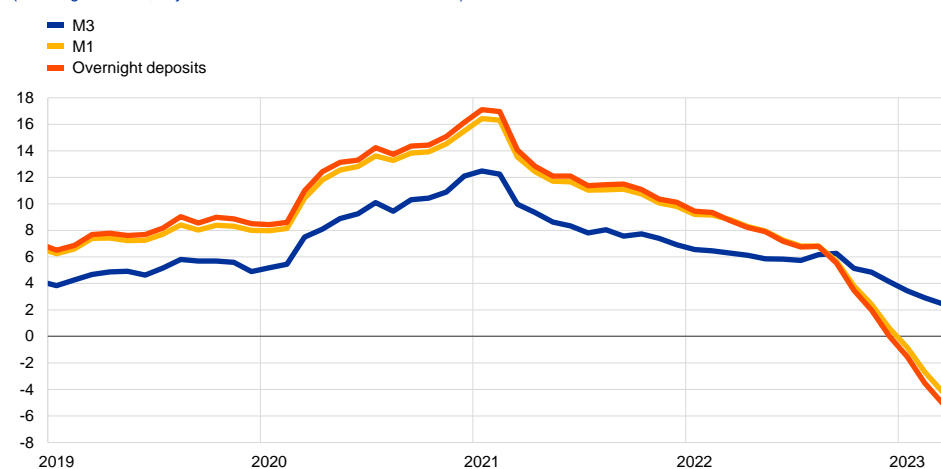
Source: ECB.
Note: The latest observations are for March 2023.

Monetary dynamics remained subdued in March 2023, driven by their most liquid components and slower credit growth. Annual broad money (M3) growth declined from 3.4% in January and 2.9% in February to 2.5% in March, the lowest rate since October 2014 (Chart 23). Moreover, the short-term dynamics of M3 are around historical minima, with similar figures seen only in early 2010. The ongoing decline in money growth can be explained by the increasing opportunity costs of holding money and the weakening credit dynamics amid higher policy rates, weak economic activity and tighter credit standards. The phasing-out of Eurosystem net asset purchases and TLTROs are also contributing to the weakening of monetary dynamics, the latter by incentivising the issuance of bank bonds, which leads to a portfolio reallocation of money holders away from deposits.

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Boxes

1 Monetary policy and housing investment in the euro area and the United States

Prepared by Niccolò Battistini, Simona Delle Chiaie and Johannes Gareis

Housing investment in the euro area and the United States fell significantly in 2022, with the fall being particularly pronounced in the United States. In the euro area, housing investment started to decline in the second quarter of 2022 and recorded a cumulative fall of about 4% by the fourth quarter of 2022 (Chart A, panel a). By contrast, the decline in the United States started as early as the second quarter of 2021. Since then, US housing investment has fallen by around 21% cumulatively, with a particularly sharp decline in the second half of 2022 when the rise in US mortgage rates led to a sharp drop in affordability for homebuyers (Chart A, panel b). These declines have taken place against the backdrop of monetary policy tightening on both sides of the Atlantic, with policy interest rates in the United States being raised earlier and reaching higher levels than euro area policy rates. Against this background, this box analyses the dynamics of housing investment in the euro area and the United States and discusses the impact of the recent monetary policy tightening on future housing investment in the euro area.

Chart A
Housing investment, short-term interest rates and mortgage rates

(quarter-on-quarter percentage changes and percentages per annum)
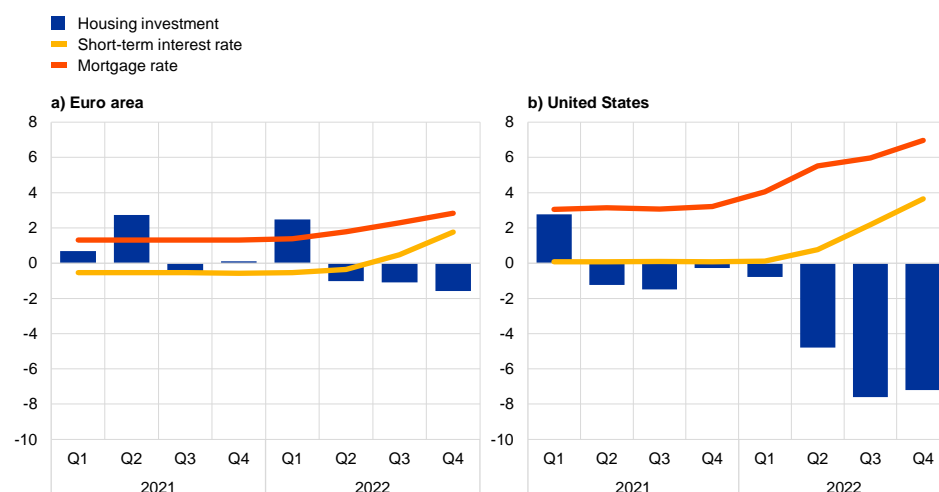
Sources: Eurostat, ECB, US Bureau of Economic Analysis, Wall Street Journal and ECB staff calculations.
Notes: Short-term interest rates for the euro area refer to the three-month EURIBOR and for the United States to the effective federal funds rate. Euro area mortgage rates refer to the composite indicator of household borrowing costs for house purchase, while mortgage rates for the United States refer to the 30-year fixed mortgage rate. All interest rates are quarterly averages.

While housing investment is one of the most interest rate-sensitive components of economic activity, it is generally much less volatile in the euro area than in the United States. The volatility of quarterly housing investment

growth in the euro area is about half that in the United States (Table A). Moreover, housing investment is only about three times more volatile than aggregate output in the euro area, while it is about six times more volatile in the United States. In spite of its smaller contribution to GDP, US housing investment accounts for a larger share of the fluctuations in aggregate output in the United States than in the euro area (see Table A). In both the euro area and the United States, however, housing investment is strongly procyclical and tends to lead the business cycle, underscoring the important role of the housing market in the economy.[1]

Table A
Properties of quarterly housing investment

(quarter-on-quarter percentage changes, percentage shares of GDP and percentages of variance explained)

	Euro area	United States
Standard deviation	1.5	3.3
% share of GDP	5.8	4.2
% share of GDP variance	9.4	10.1

Sources: Eurostat, US Bureau of Economic Analysis and ECB staff calculations.
Notes: The table shows the standard deviations of quarterly housing investment growth as well as the shares of GDP and percentages of GDP variance explained by housing investment in the period from the first quarter of 1995 to the fourth quarter of 2019. The shares of GDP are expressed in nominal terms, while the shares of variance explained are expressed in real terms. The GDP variance explained by housing investment accounts also for the covariance of housing investment with the sum of the other demand components of GDP.

Mortgage markets in the euro area are less deep than in the United States, although there are some cross-country differences in the euro area.[2]
Compared with the euro area, banks in the United States can more easily offload housing loans from their balance sheets, making it easier for these banks to shift the associated risks to third parties, with the government acting as the ultimate guarantor through several government-sponsored enterprises.[3] In addition, borrowers in the United States can withdraw mortgage equity and face only limited fees for early repayments and renegotiations and limited personal liability in the event of

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1   For a comparison of the cyclical properties of housing investment dynamics in the euro area and the United States, see Musso, A., Neri, S. and Stracca, L., "Housing, consumption and monetary policy: How different are the US and the euro area?", *Journal of Banking and Finance*, Vol. 35, Issue 11, November 2011, pp. 3019-3041. For the role of housing investment in the business cycle, see, among others, Leamer, E., "Housing is the business cycle", *Proceedings – Economic Policy Symposium – Jackson Hole*, Federal Reserve Bank of Kansas City, 2007, pp. 149-233; and Leamer, E., "Housing Really Is the Business Cycle: What Survives the Lessons of 2008–09?", *Journal of Money, Credit and Banking*, Vol. 47, Issue s1, March/April 2015, pp. 43-50.

2   For a comparison of the institutional differences between mortgage markets in the euro area and the United States, see, among others, Musso et al. op. cit. and Calza, A., Monacelli, T. and Stracca, L., "Housing finance and monetary policy", *Journal of the European Economic Association*, Vol. 11, Issue s1, January 2013, pp. 101-122. For a more recent overview of the characteristics of mortgage markets in euro area countries, see, for example, Albertazzi, U., Fringuellotti, F. and Ongena, S., "Fixed rate versus adjustable rate mortgages: evidence from the euro area banks", *Working Paper Series,* ECB, No 2322, October 2019; Corsetti, G., Duarte, J. and Mann, S., "One money, many markets", *Journal of the European Economic Association*, Vol. 20, Issue 1, February 2022, pp. 513-548; and Battistini, N., Falagiarda, M., Hackmann, A. and Roma, M., "Navigating the housing channel of monetary policy across euro area regions", *Working Paper Series*, ECB, No 2752, November 2022.

3   There are two government-sponsored enterprises (GSEs) operating in the mortgage market in the United States. These are the Federal National Mortgage Association (Fannie Mac) and the Federal Home Loan Mortgage Corporation (Freddie Mac). For the emergence of these GSEs and their role in the mortgage market in the United States in a historical context, see, among others, Green, R. and Wachter, S., "The American Mortgage in Historical and International Context", *Journal of Economic Perspectives*, Vol. 19, No 4, 2005, pp. 93-114.

insolvency.[4] In terms of the typical maturity of mortgage loans, fixed rate 30-year mortgage contracts predominate in the United States, while shorter fixed maturities of 15-25 years are common in some euro area countries and adjustable rate mortgages prevail in others.[5] Looking at various indicators of mortgage market development, reflecting the differences between mortgage markets in the euro area and the United States, these suggest that the US mortgage market is generally deeper than the euro area market. This is shown by the higher household mortgage indebtedness in the United States (as measured by the mortgage debt-to-GDP ratio), higher securitisation (measured by the mortgage-backed securities-to-GDP ratio) and higher leverage (measured by the mortgage debt-to-housing wealth ratio) across the household net wealth distribution (Chart B).

Chart B

Indicators of mortgage market development

(percentage of nominal GDP and percentage of housing wealth)

■ Euro area
■ United States
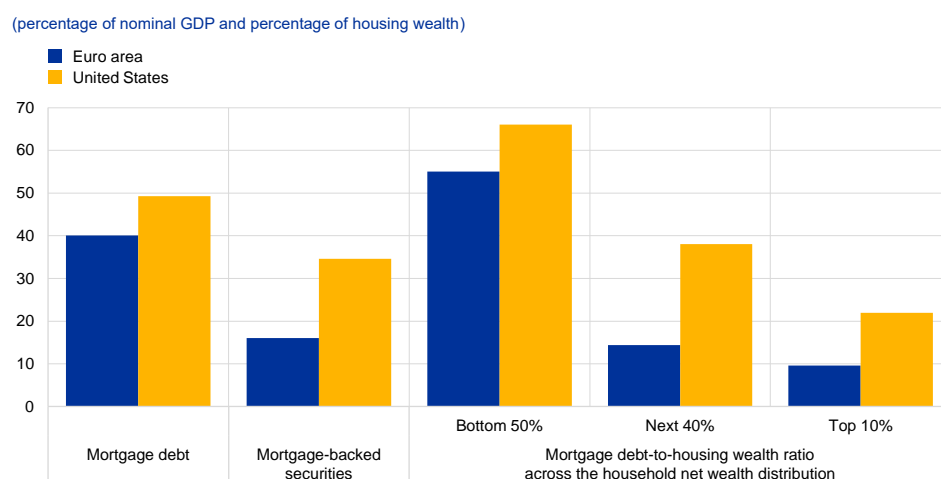
Sources: ECB, ECB Experimental Distributional Wealth Accounts, Eurostat, US Bureau of Economic Analysis, US Federal Reserve Board, US Federal Reserve Board Distributional Financial Accounts and ECB staff calculations.
Notes: Mortgage debt and mortgage-backed securities are measured as a percentage of nominal GDP. The mortgage debt-to-housing wealth ratio is measured as the ratio between mortgage debt and housing wealth across the household net wealth distribution. The chart reports average values for the period from the first quarter of 2017 to the fourth quarter of 2022. Mortgage debt refers to loans to households for house purchase. Mortgage-backed securities refer to loans for house purchase held by monetary and financial institutions (excluding the European System of Central Banks) in the euro area and securitised household mortgages for issuers of asset-backed securities, government-sponsored enterprises (GSEs), and agency and GSE-backed mortgage pools in the United States.

The lesser depth of euro area mortgage markets tempers the transmission of monetary policy shocks to housing investment. Empirical evidence typically finds that monetary policy shocks, i.e. unexpected changes in monetary policy interest rates, have stronger effects on housing investment in countries with deeper mortgage markets, such as the United States.[6] Indeed, the characteristics of the

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[4] See the box entitled "Institutional differences between mortgage markets in the euro area and the United States", *Monthly Bulletin*, ECB, August 2009.

[5] Among the largest euro area countries, Italy and Spain have traditionally had a relatively high share of adjustable rate mortgages. Looking at recent developments, in Italy the share of variable rate loans in total housing loans increased significantly to an average of around 55% in the second half of 2022, while in Spain it remained at a relatively low level of 26%. By comparison, the share of variable rate mortgages in Germany and France averaged 15% and 4% respectively in the same period. The data for the individual euro area countries on the share of adjustable rate mortgages in total housing loans can be found in the Risk Assessment Indicators database in the ECB's Statistical Data Warehouse and are available at a monthly frequency.

[6] See, for example, Musso et al. op. cit., Calza et al. op. cit., Corsetti et al. op. cit., and Battistini et al. op. cit.

mortgage market in the United States reinforce the interaction between interest rate changes and credit access: easier terms for mortgage refinancing and equity release strengthen the incentives for households to buy houses when interest rates fall, while the resultant greater indebtedness means that households are more sensitive to interest rate changes when interest rates rise.[7] However, this higher sensitivity is also influenced by the shares of fixed rate and adjustable rate mortgages, with the greater prevalence of fixed rate mortgages in the United States suggesting a more muted transmission of monetary policy.[8] Countering this, however, is the fact that the higher level of mortgage securitisation in the United States causes the mortgage market to be more closely linked to the broader capital markets, as the pricing of mortgage-backed securities has a direct influence on mortgage rates. This leads to a more direct transmission of changes in monetary policy interest rates to mortgage rates and thus housing investment.[9]

Housing investment in the euro area has been more sheltered from recent monetary policy shocks than in the United States. A Bayesian vector autoregression (BVAR) model is estimated for both the euro area and the United States for the period from the first quarter of 1995 to the fourth quarter of 2022.[10] The model includes real private consumption, the consumption deflator, housing investment, real house prices and short-term interest rates, as well as mortgage rates. It identifies three structural drivers for housing investment, namely monetary policy, the mortgage rate and housing demand shocks.[11] According to the results of the estimation, a temporary monetary policy shock that increases the short-term interest rate by 1 percentage point on impact leads, all else being equal, to a decline in housing investment in the euro area of around 5% after about three years (Chart C, panel a). However, in the United States, the same shock has a greater impact on

7   See Youngju, K. and Lim, H., "Transmission of monetary policy in times of high household debt", *Journal of Macroeconomics*, Vol. 63, March 2022. Deeper mortgage markets can also account for higher volatility in housing investment in response to exogenous changes in productivity, see Nguyen, Q., "Housing investment: What makes it so volatile? Theory and evidence from OECD countries", *Journal of Housing Economics*, Vol. 22, Issue 3, September 2013, pp. 163-178.

8   For the euro area, Corsetti et al. op. cit. and Battistini et al. op. cit. show that the strength of monetary policy transmission to the broader economy is greater in economies with larger shares of adjustable rate mortgages.

9   See Estrella, A., "Securitisation and the efficacy of monetary policy", *FRBNY Economic Policy Review*, Vol. 8, No 1, May 2022.

10 To avoid any impact of the extraordinary macroeconomic fluctuations during the coronavirus (COVID-19) pandemic on the estimated model parameters, the model is estimated following the approach of Lenza, M. and Primiceri, G., "How to estimate a vector autoregression after March 2020", *Journal of Applied Econometrics*, Vol. 37, Issue 4, June/July 2022, pp. 688-699.

11 The selection of model variable largely follows Musso et al. op. cit. and the shocks are identified with zero and sign restrictions. In particular, a monetary policy shock has an immediate impact on the short-term interest rate but is assumed to affect economic activity (i.e. private consumption and housing investment) and prices (i.e. consumer prices and house prices) only with a lag of one quarter. It is also assumed that a mortgage rate shock has an immediate impact on the mortgage rate but only lagged effects on economic activity and prices, as well as no contemporaneous effects on the short-term interest rate. The housing demand shock is a shock that affects housing investment and house prices contemporaneously and in the same direction but has no contemporaneous effect on private consumption and consumer prices. For both economies, the short-term interest rate is temporarily measured by a shadow short-term interest rate to avoid the binding zero lower bound problem in determining the impact of monetary policy. For the shock identification scheme, see Jarociński, M. and Smets, F., "House Prices and the Stance of Monetary Policy", *Federal Reserve Bank of St. Louis Review*, July/August 2008, Vol. 90(4), pp. 339-65. The shadow short-term rates are taken from Wu, J.C. and Xia, F.D., "Time-Varying Lower Bound of Interest Rates in Europe", *Chicago Booth Research Paper*, No 17-06, 2017.

housing investment, leading to a drop of around 8% after about three years.[12] Consistent with these much more pronounced effects in the United States, especially in the first year after the shock, and partly owing to the larger size of the monetary policy shocks, the recent monetary policy tightening in the United States is estimated to have had a larger impact on housing investment growth in 2022 than seen in the euro area (Chart C, panel b). In addition, the estimation results show that mortgage rate shocks also had a greater impact on housing investment in the United States compared with the euro area, while housing demand shocks weighed on housing investment to broadly the same extent in the two jurisdictions.[13]

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[12] As with housing investment, the model results suggests that the impact of a monetary policy shock on real house prices is less pronounced in the euro area than in the United States, although the relative difference is smaller. The stronger effects on the housing market in the United States compared with the euro area also hold for the mortgage rate shock.

[13] According to the model results, other unidentified factors also play a non-negligible role in explaining the recent decline in housing investment in the United States, which could be related, for example, to supply-side factors, broader financial factors, risk aversion or possible changes in preferences. A general drawback of the model is that it does not take non-linearities into account. Recent evidence shows that these could play a role in the current context, as interest rates rose from a very low level. See the box entitled "The impact of rising mortgage rates on the euro area housing market", *Economic Bulletin*, Issue 6, ECB, 2022, which examines for the euro area the impact of a 1 percentage point increase in the mortgage rate owing to a mortgage spread shock, using linear and non-linear local projection models.

Chart C

Housing investment and its drivers

a) Impact on housing investment of a 1 percentage point increase in the short-term interest rate owing to a monetary policy shock

(percentages)
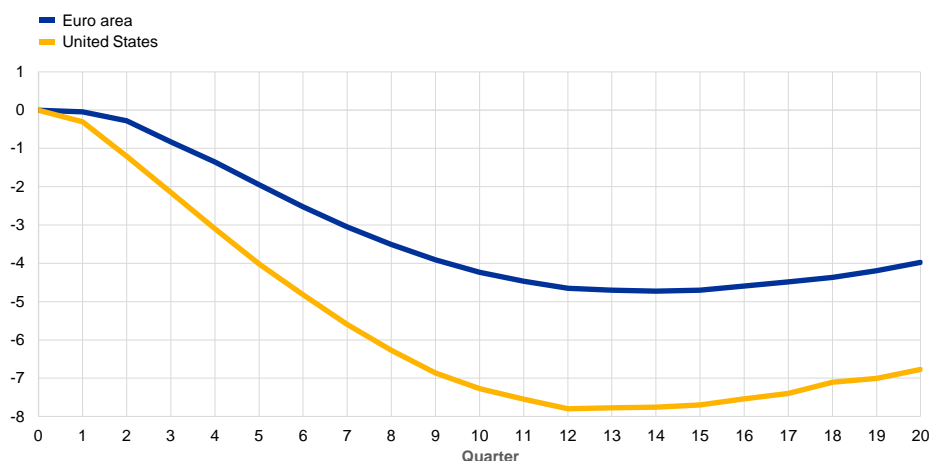
b) Changes in average quarterly housing investment growth between 2021 and 2022

(percentage points and percentage point contributions)
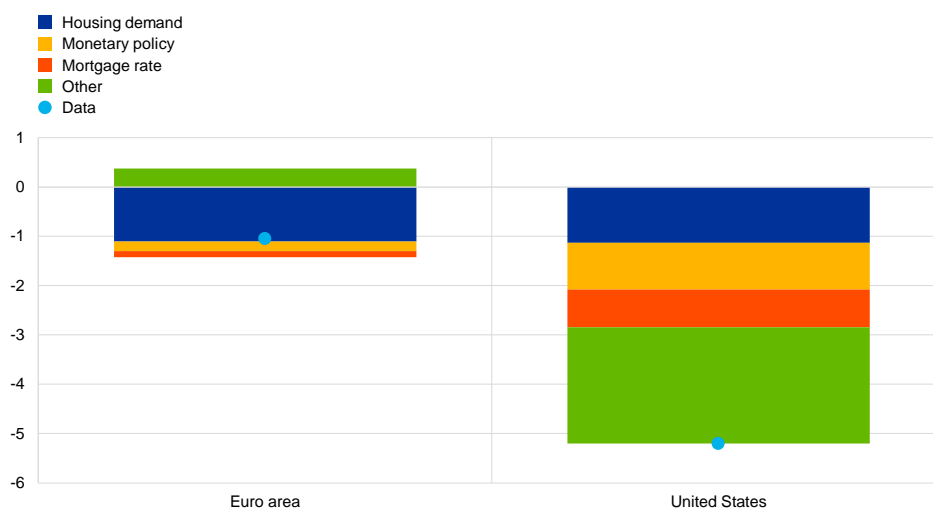
Sources: Eurostat, ECB, US Bureau of Economic Analysis, Wall Street Journal, Wu and Xia (2017) op. cit. and ECB staff calculations.
Notes: Panel a) shows the estimated effect on the housing investment level of a 1 percentage point increase in the short-term interest rate owing to a monetary policy shock. Panel b) shows the change in average quarterly housing investment growth between 2021 and 2022 and estimated drivers. The results are based on a separately estimated BVAR model for the euro area and the United States, with the shocks being identified with zero and sign restrictions. The effects shown in panel a) are significantly different from zero at the 90% confidence level.

The outlook for housing investment in the euro area is weak, despite the recent resilience. While housing investment is generally less volatile and was less affected by the recent tightening of monetary policy than housing investment in the United States, the negative effects of the increase in monetary policy interest rates in the euro area are likely to intensify over time, given the estimated lagged effects of monetary policy. Indeed, the March 2023 ECB staff macroeconomic projections for the euro area forecast a protracted and substantial decline in euro area housing investment this year and next year.

2 Intangible assets of multinational enterprises in Ireland and their impact on euro area GDP

Prepared by Malin Andersson, Stephen Byrne, Lorenz Emter, Belén González Pardo, Valerie Jarvis and Nico Zorell

Activities of multinational enterprises (MNEs) in Ireland are increasingly affecting euro area output and components of GDP. MNEs in Ireland contribute to domestic output by maintaining large production facilities, offering high-paid jobs and generating tax revenues. Over the past decade Ireland has also seen a large-scale onshoring of intellectual property products (IPP) by foreign-owned MNEs, in some cases coupled with the relocation of group headquarters ("redomiciliation") to Ireland.[1] The associated transactions in these intangible assets are often unrelated to euro area business cycle dynamics, instead reflecting tax optimisation measures conducted by large foreign-owned MNEs. Such transactions can be sizeable, irregular and instantaneous, as moving these assets (e.g. software and patents) across borders does not require any physical relocation. In the quarter when the transaction is made, the resulting volatility in headline Irish and euro area real non-construction investment is largely GDP neutral as it is offset by real services imports.[2] IPP inflows nevertheless boost both the capital stock and exports in Ireland as well as the euro area, thus contributing positively to real GDP growth in subsequent quarters. This box examines these issues relating to IPP inflows, highlighting (i) their broadly neutral impact on within-quarter euro area GDP growth, despite volatile investment and import dynamics, and (ii) their positive cumulative impact on euro area GDP growth over the medium term.

Transactions in intangible assets conducted by MNEs resident in Ireland have caused considerable volatility in quarterly euro area investment and import measures, but the within-quarter impact on euro area GDP growth has been broadly neutral. According to national accounts data, euro area non-construction investment and services imports have been particularly volatile over the past few years.[3] This is due mainly to IPP inflows to Ireland, which make up a disproportionately large share of euro area IPP investment in some quarters, thus

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1 The onshoring of intangible assets refers to IPP inflows, i.e. the transfer of assets, including patents, trademarks, copyrights, industrial processes and designs, from abroad to an entity residing in the reporting country.

2 Non-construction investment is defined as total investment minus construction investment. It is used as a proxy for business investment in the absence of such a variable in euro area national accounts data. For an insight into the impact on euro area investment of the quarterly volatility in IPP dynamics, see, for example, Box 1 in the article entitled "The recovery in business investment – drivers, opportunities, challenges and risks", *Economic Bulletin*, Issue 5, ECB, 2022.

3 MNE activities, in particular investment in and imports of IPP, directly affect measures of GDP expenditure components. This is due to statistical changes implemented to, inter alia, incorporate research and development activities into these components. See European Commission (Eurostat), European System of Accounts 2010, Luxembourg, 2013, p.74.

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blurring signals about the drivers of the euro area business cycle (Chart A).[4] IPP inflows to the Netherlands have also been particularly large on a few occasions. The within-quarter impact on euro area GDP growth of IPP transactions in Ireland is usually broadly neutral, owing to the offsetting effect of increases in services imports (Chart B).[5]

Chart A

Country shares of euro area IPP investment

(percentage of euro area IPP investment)
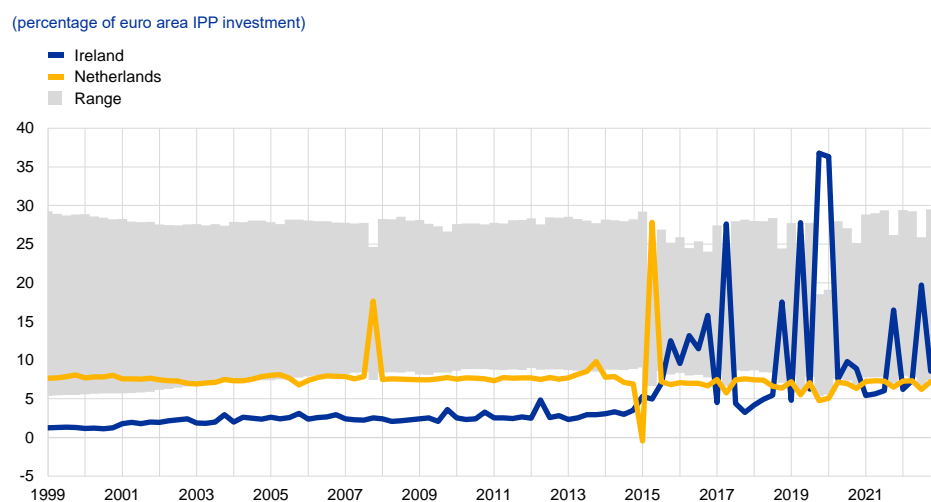
Sources: Eurostat and ECB staff calculations.
Notes: The range of countries includes Germany, Spain, France and Italy. The latest observations are for the fourth quarter of 2022.

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4   For information on MNE activities, see United Nations Economic Commission for Europe, "The impact of globalization on national accounts", United Nations, 2011. Although work is ongoing in the field of MNE activities, there is scope for data enhancements in both national accounts and balance of payments data, e.g. in terms of data on foreign-controlled non-financial corporations and the consolidation of MNE groups across borders. For further details, see Lane, P.R., "The analytical contribution of external statistics: addressing the challenges", keynote speech at the Joint European Central Bank, Irving Fisher Committee and Banco de Portugal conference on "Bridging measurement challenges and analytical needs of external statistics: evolution or revolution?", Lisbon, 17 February 2020.

5   For example, an MNE group entity residing in Ireland could buy the ownership rights of IPP, such as a piece of software, from a group entity residing in another jurisdiction. This would be recorded as an import of research and development services and as IPP investment under gross fixed capital formation.

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Chart B

Contributions of Ireland's IPP and services imports to euro area GDP growth

(percentage point contributions to quarter-on-quarter percentage changes in euro area GDP)
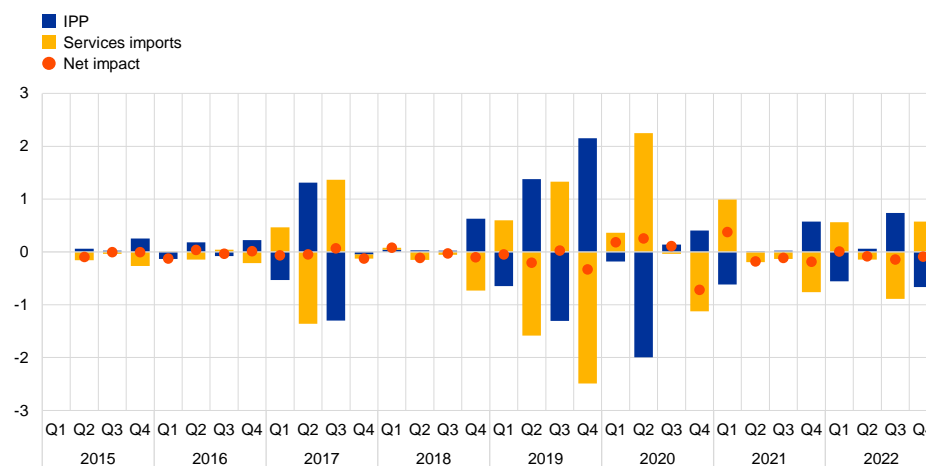
Sources: Eurostat and ECB staff calculations.
Notes: Values for the first and fourth quarters of 2020 have been interpolated. The latest observations are for the fourth quarter of 2022.

Although the occurrence of large IPP inflows to Ireland is hard to predict ex ante, ex post developments typically follow a fairly regular pattern. The timing of large IPP inflows has little to do with underlying business cycle dynamics, but instead often relates to tax optimisation decisions by individual MNEs, which are not pre-announced. This makes short-term forecasts of IPP transactions very difficult. There have been eight episodes since 2015 when quarter-on-quarter growth rates in IPP investment in Ireland exceeded 80%. In all but one of those episodes, quarter-on-quarter growth rates for both IPP investment and services imports returned to their pre-shock rates in the following quarter (Chart C). In the second half of 2022 Irish IPP dynamics were broadly in line with these historical patterns: a large IPP inflow to Ireland in the third quarter – resulting in a quarter-on-quarter growth rate of 213% in IPP investment – was followed by a much smaller inflow in the fourth quarter, implying a quarter-on-quarter decline of 61% in the level of IPP investment. The pattern for services imports was similar. Owing to the offsetting effect of services imports, the within-quarter impact of those IPP transactions on euro area GDP growth was therefore broadly neutral in both quarters.

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Chart C

IPP investment and services imports levels in Ireland around quarters with large IPP inflows

(index: level in quarter immediately prior to significant IPP inflows = 100)

- ■ Q4 2015
- ■ Q2 2017
- ■ Q4 2018
- ■ Q2 2019
- ■ Q4 2019
- ■ Q4 2020
- ■ Q4 2021
- ■ Q3 2022
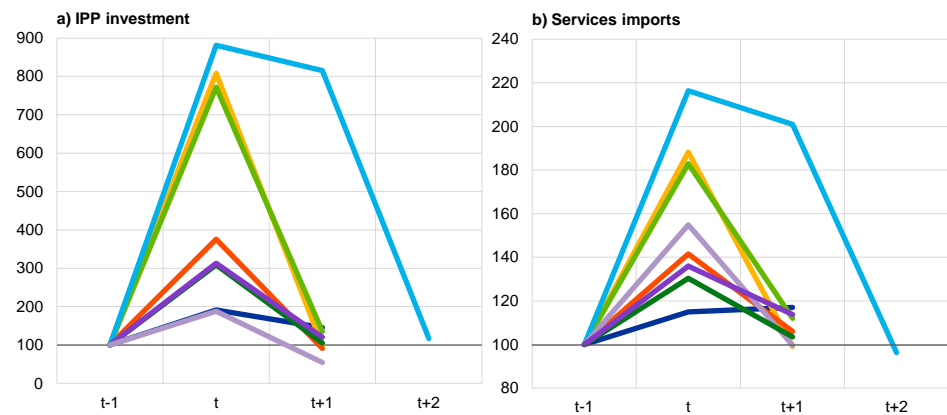
Sources: Eurostat and ECB staff calculations.
Notes: "t" denotes quarters in which there were significant IPP inflows to Ireland. The latest observations are for the fourth quarter of 2022.

Modified investment and import data series can give a clearer picture of underlying dynamics in the real economy than the headline series. Ireland's Central Statistics Office computes and publishes a modified data series that is designed to reflect domestic investment activity and abstracts from the erratic volatility seen in IPP data. The "modified investment" series is defined as total investment minus IPP investment and investment in aircraft purchased by leasing companies resident in Ireland.[6] A comparison shows that in the fourth quarter of 2022 euro area non-construction investment fell quarter on quarter by 0.4% according to the adjusted series, but by 5.8% according to the official data (Chart D). Proxies for services imports, calculated by subtracting IPP transactions from services imports, show a similar difference. These modified series exhibit smoother patterns that make it easier to assess the business cycle. Given that the IPP transactions that create the volatility have thus far mainly taken place with firms outside the euro area, the adjustment typically does not distort intra-euro area trade.

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[6]   Aircraft leasing companies in Ireland are mostly foreign-owned and manage around half of the global fleet of leased commercial aircraft. Their activities mainly affect the investment and trade components of GDP. In 2021 investment in aircraft for leasing purposes amounted to around 10% of total investment, compared with 45% for IPP investment. For more details, see Osborne-Kinch, J., Coates, D. and Nolan, L., "The Aircraft Leasing Industry in Ireland: Cross Border Flows and Statistical Treatment", *Quarterly Bulletin*, No 1, Central Bank of Ireland, January 2017.

Chart D

Euro area non-construction investment and services imports with and without IPP investment in Ireland

(quarter-on-quarter percentage changes)

- Non-construction investment
- Modified non-construction investment
- Services imports
- Modified services imports
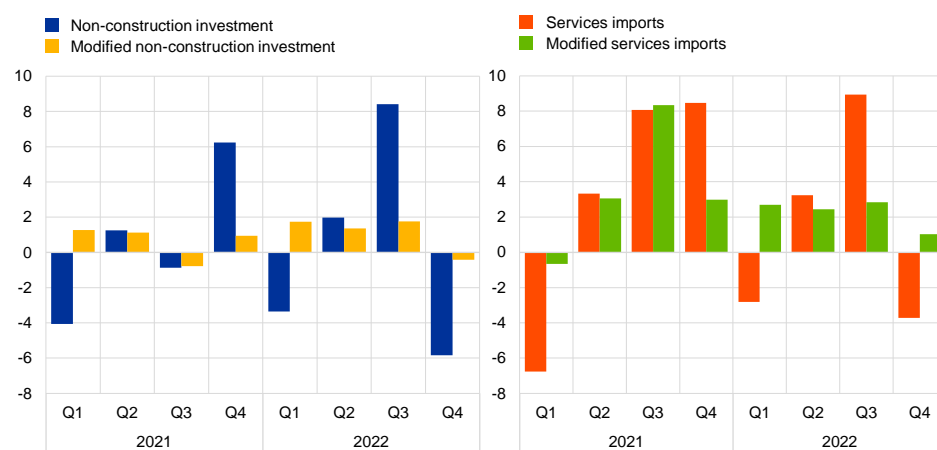
Sources: Eurostat, Ireland's Central Statistics Office and calculations by staff at the Central Bank of Ireland and the ECB.
Note: The latest observations are for the fourth quarter of 2022.

IPP inflows nevertheless contribute positively to euro area GDP growth in subsequent quarters. Ireland, which accounted for 4% of euro area GDP in 2022, contributed disproportionately (around 18%) to the cumulative increase in euro area GDP between the fourth quarter of 2014 and the first quarter of 2023 (Chart E). This largely reflects long-term positive impacts on euro area GDP growth of onshored IPP, as these (i) boost the capital stock, which spurs both productivity and depreciation (consumption of capital); and (ii) generate higher export streams.[7] The income generated by IPP held in Ireland accrues mainly to foreign residents. Modified gross national income (GNI*), an indicator that corrects gross national income (GNI) for MNE-related income outflows and depreciation costs borne by foreign residents, is currently only around half the size of GDP.[8]

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[7]   IPP-related export streams can arise from either higher services exports (e.g. software licences) or higher goods exports through contract manufacturing. In contract manufacturing, a firm hires a foreign company to produce a good but retains ownership of the inputs, including IPP. Exports from Ireland produced via contract manufacturing were usually offset by associated imports (particularly royalty payments for the use of intellectual property). However, with the onshoring of some IPP, fewer such payments need to be made and hence services imports no longer increase in line with the exports produced by contract manufacturers. See, for example, Irish Fiscal Advisory Council, "Pre-Budget 2017 Statement", Box A, September 2016.

[8]   More specifically, the GNI* indicator published by Ireland's Central Statistics Office adjusts GNI for the undistributed profits of redomiciled companies and the depreciation of IPP and leased aircraft.

Chart E

Euro area GDP and contributions from Ireland

(cumulated euro area GDP from Q4 2014 to Q1 2023, EUR millions; contributions from Ireland and the rest of the euro area)
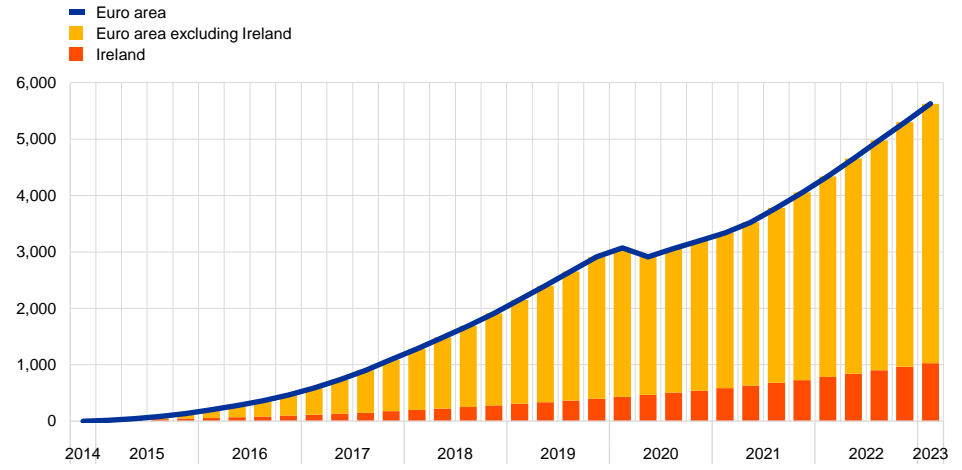
Sources: Eurostat and ECB staff calculations.
Note: The latest observations are for the first quarter of 2023.

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3 The energy shock, price competitiveness and euro area export performance

Prepared by Lorenz Emter, Vanessa Gunnella and Tobias Schuler

Modest global demand, supply bottlenecks and surging energy costs have weighed on euro area export performance in the past year. While euro area exports rebounded sharply immediately after the coronavirus (COVID-19) pandemic, the past two years have seen relatively anaemic euro area export growth. The euro area export weakness was partly a reflection of subdued global trade dynamics as firms struggled with supply chain disruptions. However, the pick-up in the summer of last year notwithstanding, euro area exports have tended to lag the global recovery in trade, with euro area exporters failing to recover market shares lost during the pandemic (Chart A). The recent easing of supply bottlenecks should help bolster global trade prospects in the short term, including for the euro area. However, exporting firms, particularly those in the euro area, also face the challenges of still elevated energy costs. This box examines empirical evidence on the role of the energy price shock in affecting price competitiveness and euro area export performance.

Chart A

Extra-euro area goods exports and global imports

(3-month-on-3-month percentage growth)
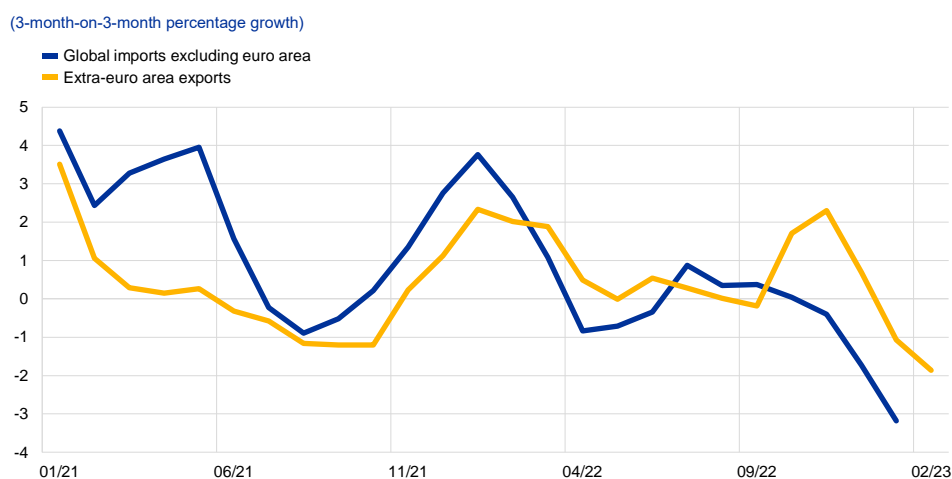
Sources: Eurostat and CPB Netherlands Bureau for Economic Policy Analysis.

Energy supply constraints affect euro area exports through two main channels. First, higher global energy prices tend to dampen global demand, as income is redistributed from energy-consuming countries to energy-producing ones, which typically have a lower marginal propensity to spend. Second, because energy costs are a critical component of production costs, higher energy prices can also undermine the ability to compete in global markets. That has been particularly relevant recently because the recent energy shock has affected the euro area disproportionately. While global energy prices rose sharply in 2021 and 2022, euro area energy prices rose substantially more. For example, in 2022 wholesale gas

prices in the euro area were on average 13 times higher than in 2020, while those in the United States and Asia were 3.5 and 9 times higher than their respective 2020 levels.[1]

Empirical evidence suggests that the energy price shock has dampened euro area exports over the past year. A historical shock decomposition derived from a structural vector autoregression (SVAR) for aggregate extra-euro area goods exports shows that the chief drivers of export dynamics in the past year have been shifts in global demand conditions and the effects of supply bottlenecks (Chart B). The energy supply shock has played a less significant role in dampening export growth, lowering export growth by about 0.6 percentage points on average over the past year. As this shock is identified through variations in global oil prices and production – it does not fully capture the effect of the energy crisis evident in the sharp increases in gas prices following Russia's invasion of Ukraine.[2] Indeed, cross-sectional analysis shows that euro area exports have decreased strongly in high energy-intensive sectors over the past year (Chart C). The contraction in exports was most evident for the basic metal and chemical industries, which are highly energy-intensive and saw contractions of 18% and 14% respectively in the fourth quarter of 2022.[3]

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[1]   The benchmark series used are Natural Gas at the Title Transfer Facility (TTF) Virtual Trading Point for the euro area, the Henry Hub Natural Gas Spot Price for the United States and the Japan Korea Marker (JKM) spot price index for liquified natural gas (LNG) for Asia.

[2]   We obtain similar results using a synthetic energy price index for euro area oil and gas prices. With this alternative identification, bottleneck shocks are distinguished from energy supply shocks by assuming a positive effect on the ratio of euro area industrial production in energy intensive sectors to that in non-energy intensive sectors for the former and a negative sign for the latter. According to this specification, the energy supply shock has lowered export growth by about 0.8 percentage points on average over the past year.

[3]   In some industries the energy shock may have exacerbated ongoing longer-term trends. Moreover, empirical evidence shows that in energy-intensive sectors imports substituted production as domestic energy prices were higher. See the box entitled "How have higher energy prices affected industrial production and imports?", *Economic Bulletin*, Issue 1, ECB, 2023.

Chart B

Historical decomposition of extra-euro area goods export volumes using a SVAR model

(3-month moving average of year-on-year percentage changes, percentage point contributions)

- ■ Demand
- ■ Energy supply
- ■ Bottlenecks
- ■ Other
- ─ Total
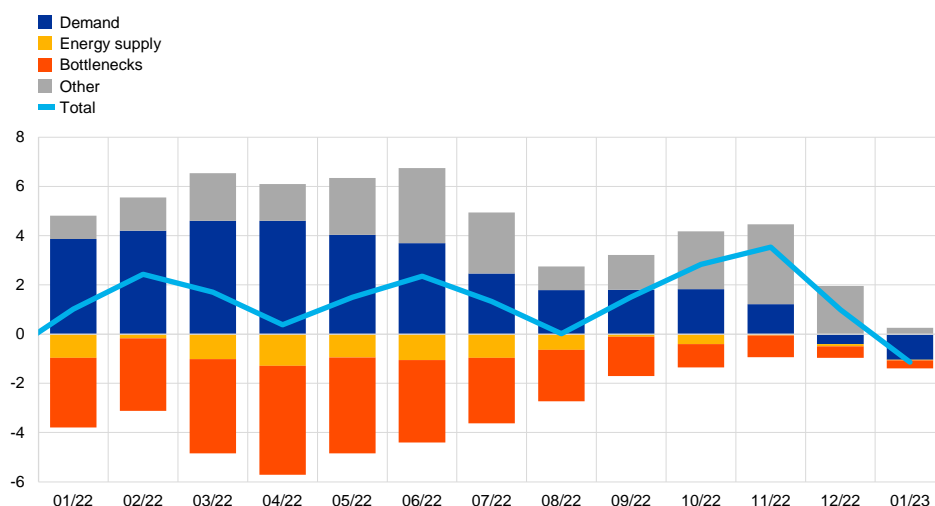
Sources: Eurostat, Organisation for Economic Co-operation and Development (OECD), CPB, US Energy Information Administration, Federal Reserve Bank of New York and ECB calculations.
Notes: The SVAR model is based on global and euro area data from January 2003 to January 2023. The assumed sign restrictions on impact are: demand shocks imply Brent (+), oil production (+), world imports (+), world consumer prices index (CPI) (+), supply chain pressure (+), euro area exports (+); bottleneck shocks imply world imports (-), world CPI (+), supply chain pressure (+), euro area exports (-); energy supply shocks imply Brent (+), oil production (-), world real imports (-), world CPI (+), supply chain pressure (0), euro area exports (-).

Chart C

Energy intensity and extra-euro area export growth

(x-axis: energy intensity, percentages; y-axis: year-on-year growth in Q4 2022, percentages)
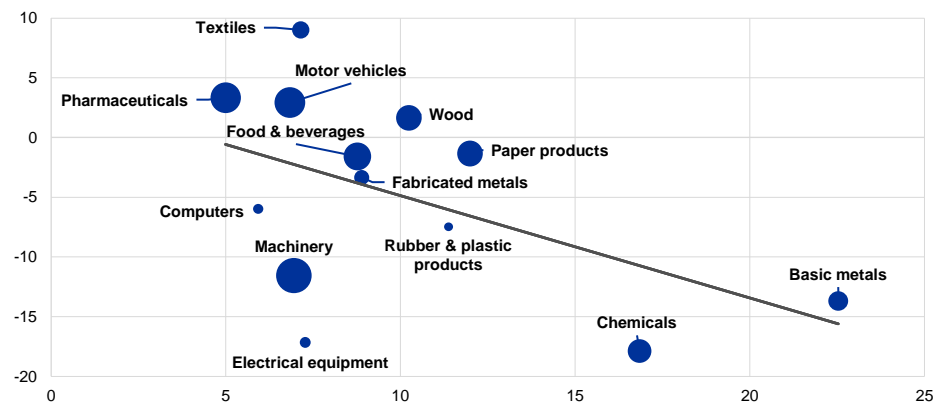
Sources: Eurostat, OECD Trade in Value Added (TiVA) database and ECB staff calculations.
Notes: Energy intensity is calculated as energy input as a percentage of total output. Data for energy inputs refer to 2018. Extra-euro area export growth for each sector refers to quantities. Bubble sizes refer to the share of each sector in extra-euro area export values.

Indicators reflecting producer prices point to a deterioration in export price competitiveness. Measures of the real effective exchange rate – based on the GDP deflator or unit labour costs (ULC) – suggest that euro area price competitiveness improved in 2021 and in the first part of 2022, before the recent appreciation of the euro partially unwound this effect (Chart D). Several factors explain these developments: (i) foreign exporters competing in the same markets also witnessed an increase in input costs as raw material and energy prices surged globally; (ii)

other production costs (compensation of labour and capital) have remained contained relative to competitors; and (iii) significant depreciation of the euro at the start of the energy crisis bolstered euro area price competitiveness (Chart D, green line).[4] However, the producer price index (PPI)-based measure, which better reflects relative price pressures for tradeable goods, suggests a bigger hit to euro area competitiveness. During 2022 the gains in competitiveness from the depreciation of the euro were offset by relative PPI price increases, suggesting a more pervasive role of the energy price shock for the euro area than for its competitors.

Chart D

Effective exchange rate of the euro

(index: March 2019=100)
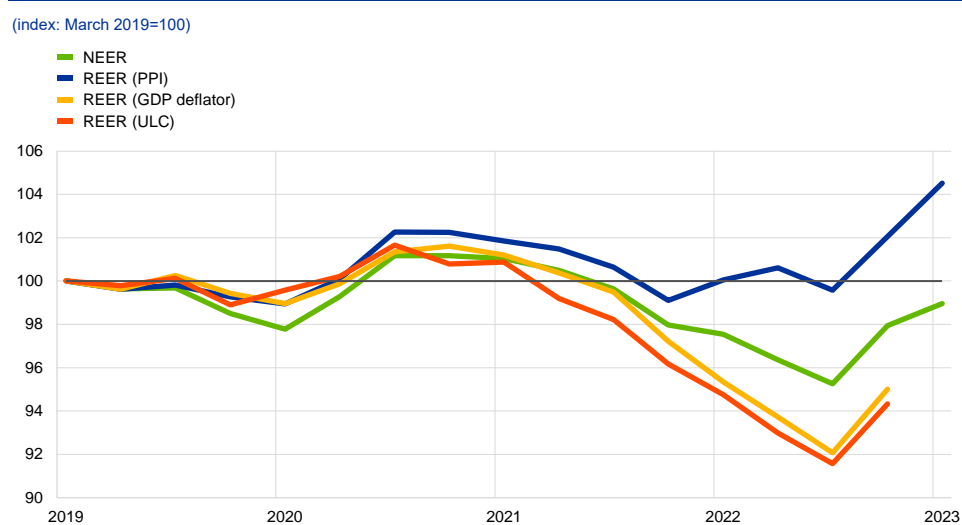
Sources: ECB and ECB staff calculations.
Notes: REER and NEER refer to the real/nominal effective exchange rate of the euro against the currencies of 18 of the euro area's most important trading partners. A positive (negative) change corresponds to an appreciation (depreciation) of the euro.

The medium-term outlook for competitiveness may be less benign. At the peak of the recent energy crisis, gas prices increased more in the euro area than in the United States or Asia. Despite the fall in energy prices (particularly gas prices) since the summer of 2022, energy prices remain elevated relative to pre-pandemic levels (TTF gas prices, the reference series used for the euro area, are currently three times higher, while the US benchmark is on a par with its December 2019 levels). Moreover, the euro area still faces significant challenges related to energy supply. While the near-term picture is relatively benign following a mild winter, the euro area still needs to find a replacement for Russian gas supplies on a sustained basis over the medium term. Alternative sources could imply structurally higher prices (gas futures for 2025 are three times higher in the euro area than the equivalent in the United States) and more volatile import prices. At the same time, in the medium term the euro area also needs to factor in the potential costs of the necessary green energy transition, which in Europe could amount to 6.5% of GDP between 2021 and

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[4]   In relation to other production costs for competitors, see the box entitled "Inflation developments in the euro area and the United States", *Economic Bulletin*, Issue 8, ECB, 2022.

2050 – the highest spending among advanced economies.[5] These investments are likely to bring efficiency gains and lead to positive effects over the longer term, including via a substantial decrease in energy costs.[6] However, during the transition phase, an increase in energy input costs would entail higher production costs, which could weaken euro area price competitiveness in the medium term, as recent developments in PPI-based real effective exchange rate measures suggest.

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[5] Estimation based on a Net Zero 2050 scenario and referring to spending on physical assets for energy and land-use systems. See "The net-zero transition: What it would cost, what it could bring", McKinsey Global Institute, 2022. Estimations vary according to the scenario (Paris Agreement benchmark or Net Zero 2050 scenario), underlying assumptions and the way costs are defined. The European Commission estimates that average annual investment needs in the energy system and for transport in the EU amount to €1.24 trillion at 2022 prices (see "Investment needs assessment and funding availabilities to strengthen EU's Net-Zero technology manufacturing capacity", *Commission Staff Working Document*, European Commission, March 2023).

[6] For an impact assessment, see "Stepping up Europe's 2030 climate ambition – Investing in a climate-neutral future for the benefit of our people", COM(2020) 562 final, European Commission, 17 September 2020.

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

Prepared by Gabe de Bondt, Friderike Kuik, Gwenaël Le Breton, Richard Morris and Sara Romaniega Sancho

This box summarises the findings of recent contacts between ECB staff and representatives of 61 leading non-financial companies operating in the euro area. The exchanges took place between 30 March and 13 April 2023.[1]

In aggregate terms, these contacts pointed to stagnating or only modestly growing activity in the first quarter, with varied development across sectors. In this respect, developments were, on average, in line with expectations expressed during the previous round of exchanges in January. Most contacts in the consumer goods, retail and construction sectors reported declining activity, but this was offset by reports of growth in the demand for consumer services and the production of capital goods.

Activity in the industrial sector continued to be influenced by forces working in opposing directions. On one hand, high inflation, together with the satiation of consumer demand for certain items during the coronavirus (COVID-19) pandemic, continued to depress demand for many consumer goods. Moreover, since mid-2022 many companies had reportedly been reducing their inventories and this reduction was viewed as still ongoing in some sectors, causing divergent developments in the demand for related intermediate goods. Construction activity was adversely affected by falling demand for residential development, reflecting higher input and financing costs. On the other hand, a relatively rapid easing of past supply disruption facilitated increased production, primarily in the capital goods sector. According to the contacts, supply chains were largely back to normal. Automotive-related production was therefore recovering (albeit still at a low level), while producers of machinery and equipment reported high or increasing production levels to deal with still large order backlogs, especially those serving customers' investment needs in relation to the transition to net zero. Activity in the agri-food sector was supported by generally inelastic demand, reduced imports and high prices incentivising increased production. In the energy sector, the generation of wind and solar energy had increased in recent months.

Contacts in the services sector reported subdued activity in retail and the transport of goods but strongly growing demand for travel, tourism and IT services. Most retailers, especially those selling non-essential goods, reported contracting activity in line with the downbeat assessment of contacts in the consumer goods industry. This was consistent with reports from contacts in the transport sector, with activity in road haulage and shipping described either as declining or as stabilising at somewhat lower levels than a few quarters ago. By contrast, contacts from across the travel and tourism industry were very upbeat about strongly growing

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[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.

demand for travel services, despite rising prices, both during the winter and Easter and in relation to bookings for the summer season. IT services continued to be another driver of services sector growth, in part benefiting from demand related to environmental, social and governance (ESG) and regulatory requirements.

Current trends in activity were generally expected to persist during the second quarter, while the outlook for later in the year was still subject to elevated uncertainty. Expectations of a further pick-up in activity in the second half of the year were muted in view of mixed signals about global demand and continued uncertainty surrounding energy prices/supply, to which was added some nervousness caused by recent problems with some banks.

Chart A

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

(averages of ECB staff scores)
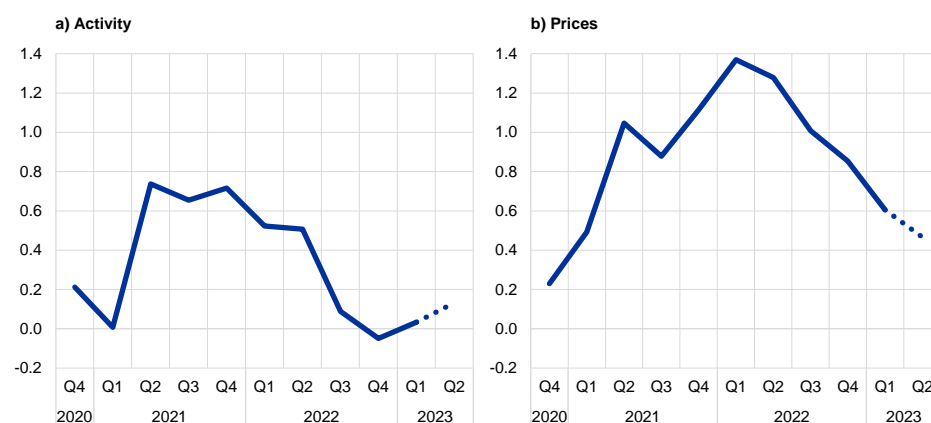
Source: ECB.
Notes: The scores reflect the average of scores given by ECB staff in their assessment of what contacts said about quarter-on-quarter developments in activity (sales, production and orders) and prices. Scores range from -2 (significant decrease) to +2 (significant increase). A score of 0 would mean no change. The dotted line refers to expectations for the next quarter.

Developments in – and the near-term outlook for – employment were quite stable overall. Reports of strong employment growth were limited to relatively few sectors, most notably energy (driven by investment in renewables and clean energy infrastructure) and travel (given the ongoing strong recovery of tourism). Reports of lay-offs and anticipated lay-offs were also few in number and mainly in the energy-intensive intermediate goods sectors. Companies that wanted to reduce headcount could generally achieve this through natural churn, although some expected increasing scrutiny of labour costs as the year went on in view of rising wages and moderating price growth. Employment agencies reported somewhat mixed developments, with weak activity in temporary placements but still strong growth in permanent placements. Contacts from a range of industries continued to find recruitment challenging given shortages of various skills, while there were also some reports of activity being hindered and labour costs rising due to high rates of sick leave.

The rate of increase in selling prices was said to be moderating overall, broadly as anticipated at the beginning of the year. To a large extent, this moderation reflected stabilising non-labour input costs and the rebalancing of supply

and demand for many goods since last summer. This was, however, partly offset by increasing cost pressure from wages. Contacts in the consumer goods and retail sectors (at least those producing and/or selling non-essential items) saw the pricing environment becoming more difficult amid reduced demand and strong competition. There were, however, a number of sectors in which contacts still pointed to strong selling price increases, at least during the first half of 2023. In the industrial sector, notwithstanding the fact that the prices of energy and many upstream intermediate goods had fallen in recent months, such prices mostly remained at historically high levels. Consequently, the prices of many inputs were still rising as past input cost increases and/or higher wages were passed through. Contacts in the more labour-intensive parts of the business and consumer services sectors anticipated continued strong price growth in view of high wage growth. Pricing in the travel and tourism sectors also continued to benefit from exceptionally strong price-inelastic demand.

Wage expectations were basically unchanged from the previous survey round, and wage growth remained the main cost concern. Taking a simple average of the mid-points of the quantitative indications provided, contacts anticipated growth of around 5% in 2023 (up from levels around 3% in 2022). Many firms also made significant one-off payments to employees in 2022 and/or 2023.

Despite the favourable pricing environment in many sectors recently, contacts pointed to profit margins being quite stable overall, especially if developments in 2022 and expectations for 2023 were considered together. Margins had increased quite significantly in the energy, transport and agri-food sectors in 2022, reflecting the exceptional market developments in these sectors. However, at least for energy and goods transport, this situation was already reversing. In business-oriented sectors (capital goods, intermediate goods, business services), most contacts said that the environment had been favourable for passing through rising costs to prices during 2022, in part due to supply disruption which caused customers to focus more on availability than price. The effect of this price and cost inflation on margins varied depending on how quickly prices could be adjusted given contractual obligations, and the aggregate picture for 2022 and 2023 was one of broadly stable margins. By contrast, in consumer-oriented sectors (consumer goods and services, including retail trade), many contacts said that it had been difficult to fully pass through increased costs to prices, and the aggregate picture was of margins being squeezed, especially in 2022, and, to some extent, this was also expected to continue in 2023.

5 Indicators for producer price pressures in consumer goods inflation

Prepared by Ieva Rubene

The increase in consumer goods price inflation in the euro area over the last two years was preceded by a sharp rise in producer prices. Leading indicator properties of industrial producer prices for consumer prices form a well-established and central element of the ECB's analysis of pipeline pressures.[1] A previous analysis introduced a framework to obtain a time profile for the impact of producer prices on consumer prices.[2] This box takes that analysis further by using the time profile of these impacts to derive indicators for producer price pressures (IPPIs), which summarise total price pressures from producer prices on food and non-energy industrial goods (NEIG) consumer prices over time. These IPPIs complement a broad range of various measures that are useful in anticipating and assessing the extent of underlying price pressures in the economy.[3]

Producer price indices (PPIs) capture the prices of goods at the time when these goods leave factory gates. PPIs reflect the costs of production and the markups on these costs, while consumer prices also include taxes and levies, as well as the costs and markups of the distribution and retail sectors. There are different indicators of PPIs, which capture prices at different stages of the production chain. For example, PPIs for energy and intermediate goods capture pricing at earlier stages of production. For NEIG prices, the immediately relevant PPI is that of domestic sales for non-food consumer goods industries, whereas for consumer food prices it is the PPI of domestic sales for food industries.[4] These PPIs capture pricing developments in both the earlier and later stages of the production chain. Due to the conceptual differences, different weights of subcomponents in producer and consumer price indices, and the fact that consumer prices also reflect the prices of imported goods in addition to domestically produced goods, there is no full alignment between developments in the PPIs and their respective HICP counterparts (Chart A). The role of these differences becomes apparent, for example, in the somewhat greater amplitude of producer price developments over inflation cycles.

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1   See the boxes entitled "Industrial producer prices for sales in domestic and non-domestic markets", *Monthly Bulletin*, ECB, April 2013; and "What can recent developments in producer prices tell us about pipeline pressures?", *Economic Bulletin*, Issue 3, ECB, 2017.

2   See the box entitled "Recent developments in pipeline pressures for non-energy industrial goods inflation in the euro area", *Economic Bulletin*, Issue 5, ECB, 2021.

3   See P.R. Lane, "Underlying inflation", lecture at Trinity College Dublin, 6 March 2023.

4   The euro area producer price index is an aggregation of individual country data, which refer only to the domestic market (i.e. not to the internal euro area market as a whole).

Chart A

Developments in euro area producer price indices (PPIs) and the respective HICP

a) Prices for food products

(annual percentage changes)
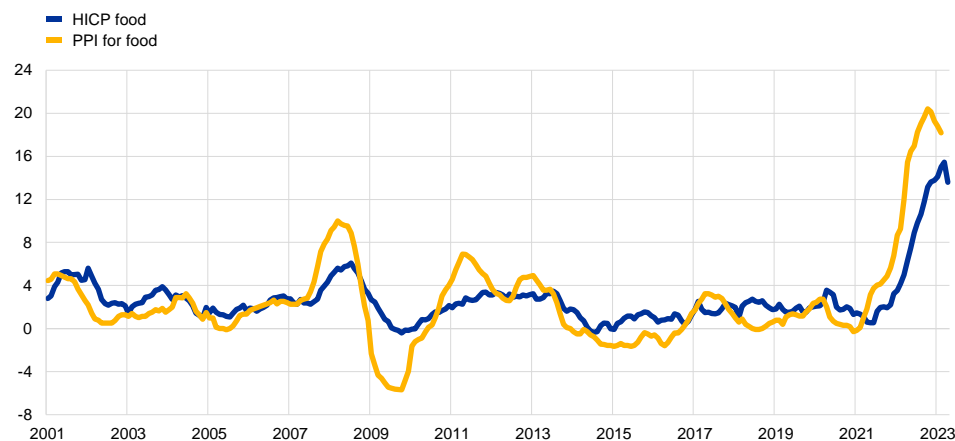
- HICP food
- PPI for food

b) Prices for non-energy industrial goods

(annual percentage changes)

- HICP non-energy industrial goods
- PPI for non-food consumer goods

Sources: Eurostat, ECB calculations.
Note: The latest observations are for April 2023 (flash) for HICP and February 2023 for producer prices.

Simple correlation analysis suggests that the strength of the link between producer and consumer price indices varies over time (Chart B). There was a sharp rise in the contemporaneous correlation coefficients between PPI and HICP for both food and non-food consumer goods in 2022. This suggests that the exceptional underlying surge in energy and bottleneck-related costs since the beginning of 2021 revived the link between producer and consumer prices after an apparent decoupling during the years of low inflation.[5] The recent increase also indicates that the extent of the underlying pressures has reduced the ability of firms to buffer these substantially higher costs by adjusting profits and has led to a more

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[5]   Conceptually, the link between PPIs and changes in consumer prices would be more appropriate if changes in indirect taxes could be excluded from the measured HICP series. However, the approach for deriving producer price pressures in this box is based on the HICP including the impacts from changes in indirect taxes. Nevertheless, when using the HICP series published by Eurostat at constant tax rates, the results are broadly similar to the ones reported in this box.

pronounced adjustment of consumer prices than in the low-inflation environment, thus contributing to the inflation surge over the last two years.

Chart B

Contemporaneous correlation over time

(correlation coefficient; five-year moving average)

- PPI food with HICP food
- PPI food with HICP food (at constant tax rates)
- PPI non-food consumer goods with HICP NEIG
- PPI non-food consumer goods with HICP NEIG (at constant tax rates)
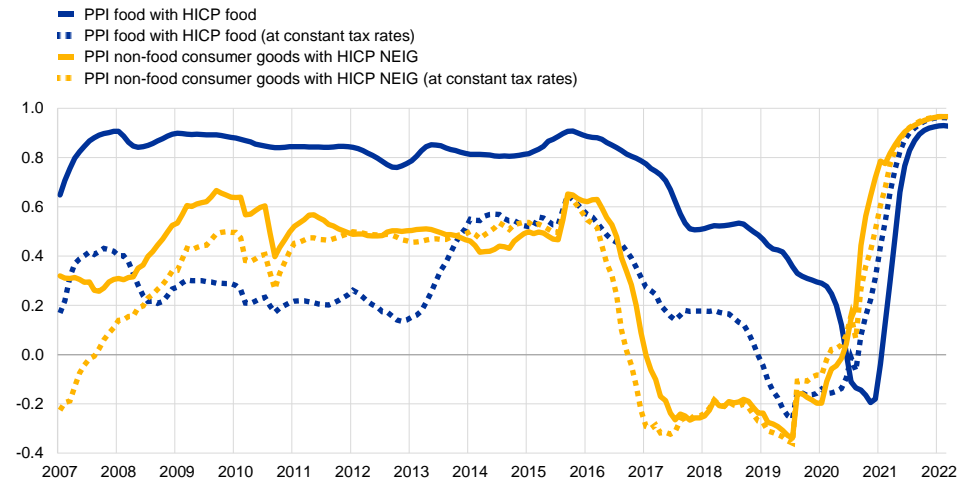
Sources: Eurostat, ECB calculations.
Notes: The latest observations are for February 2023. Correlation coefficient is calculated for the annual rates of change.

IPPIs are constructed using dynamic impulse responses of consumer prices to producer prices (elasticities) obtained with the local projections (LP) estimation method.[6] The equations relate the food and NEIG consumer prices to their own lags and contemporaneous and lagged changes in the respective PPIs. In addition, the equation for NEIG consumer prices includes import prices of non-food consumer goods and, to capture demand conditions, the unemployment rate. The estimation results suggest that NEIG prices respond to producer prices gradually, but the speed of these responses is likely to have significantly increased over the last two years.[7] The results including data for the more recent period are also accompanied by a much wider confidence band, in part reflecting the inclusion, in one specification, of both a previously lower inflation regime and the currently high inflation regime, which the model interprets as an increase in uncertainty. Such a widening of confidence bands and an increase in the correlation coefficient may indicate changes in the pricing strategies of firms amid the significant cost shocks observed as of 2021.

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[6]   The LP method generates estimates for each forecast horizon H by regressing the dependent variable at T+H on the available information set at time T using quarterly frequency data. This approach mirrors the one used by Colavecchio, R. and Rubene, I. in "Non-linear exchange rate pass-through to euro area inflation: a local projection approach", *Working Paper Series*, No 2362, ECB, Frankfurt am Main, January 2020. Estimations with data up until 2019 suggest that a 1% increase in producer prices would subsequently lift NEIG consumer prices by around 0.8% over the next two years. Estimations using data up until the second quarter of 2022 point to a much faster impact of PPIs on NEIG prices – specifically, a full pass-through within the first two quarters, implying a substantially stronger link between producer and consumer prices more recently.

[7]   The higher frequency of price changes over the more recent period has also been reported by large non-financial companies operating in the euro area. See the box entitled "Main findings from the ECB's recent contacts with non-financial companies", *Economic Bulletin*, Issue 1, ECB, 2023.

The LP results for consumer food prices show a faster response to changes in the producer prices than in the case of NEIGs. Moreover, the size and speed of the impact seem to have remained unchanged when extending the estimation sample with data from the last two years.[8] Examining whether the response of consumer food prices is different following increases or decreases in producer prices shows that the response after increases is faster. After a 1% increase in food producer prices, an equivalent 1% impact on consumer food prices already materialises within the first year, whereas after a 1% decline in producer prices the impact is more gradual and reaches only 0.8% within two years.[9] Such an asymmetry in responses was not evident in the case of non-food consumer goods prices.

The constructed IPPIs suggest that underlying cost pressures rose significantly in the course of 2022 and remained high for both non-food consumer goods and food products in early 2023. The elasticities for producer price impacts on consumer prices can be transformed to construct indicators which capture the cumulative impact of changes in producer prices on the annual inflation rate of non-food consumer goods and food products over time.[10] The IPPIs shown in Chart C encompass the pressures on consumer prices based on changes in producer prices over the previous eight quarters. According to these indicators, developments in producer prices over the course of 2021 and 2022 imply that the peak of the upward pressures on consumer prices for NEIG and food products may have been reached in the first and second quarters of 2023 respectively (Chart C). If the index for producer prices stops increasing or even starts declining in relation to the previous quarter, the underlying pressures can be expected to ease thereafter. Historically there are sizeable differences between the IPPIs and consumer prices, which in part reflects a different amplitude of volatility in producer prices relative to consumer prices.

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[8] The faster response of consumer food prices is obtained in an estimation using the sample up until 2019, whereas when extending the estimation sample to Q2 2022, the speed of NEIG response to the respective PPI is approaching that of food.

[9] The LP estimation can also be used to examine whether positive changes in the respective PPI have the same pass-through to consumer prices as negative changes. Such an analysis is done by introducing dummy variables – see the approach in Colavecchio and Rubene, op. cit.

[10] LP regressions provide an estimate for the cumulative impact of a 1% change in the PPI on consumer prices. The estimated responses seem to stabilise after eight quarters – therefore, this horizon is used for the derivation of the IPPI. To obtain an estimate of the impact on the annual inflation rates, results of the LP for the impact on consumer price levels are transformed to the impact on the annual rate of change. The impacts are then rescaled for the size of the quarter-on-quarter change each period and assigned for the eight quarters ahead accordingly. Thereafter, the total impact on consumer prices for a given quarter is obtained by adding the impacts from PPI (with an appropriate lag impact) in the preceding eight quarters.

Chart C

Indicators of producer price pressures on consumer goods prices (IPPIs)

a) IPPI for HICP non-energy industrial goods

(annual percentage changes)

- 95% confidence range
- HICP NEIG
- IPPI for HICP NEIG (est. to Q4 2019)
- IPPI for HICP NEIG (est. to Q2 2022)
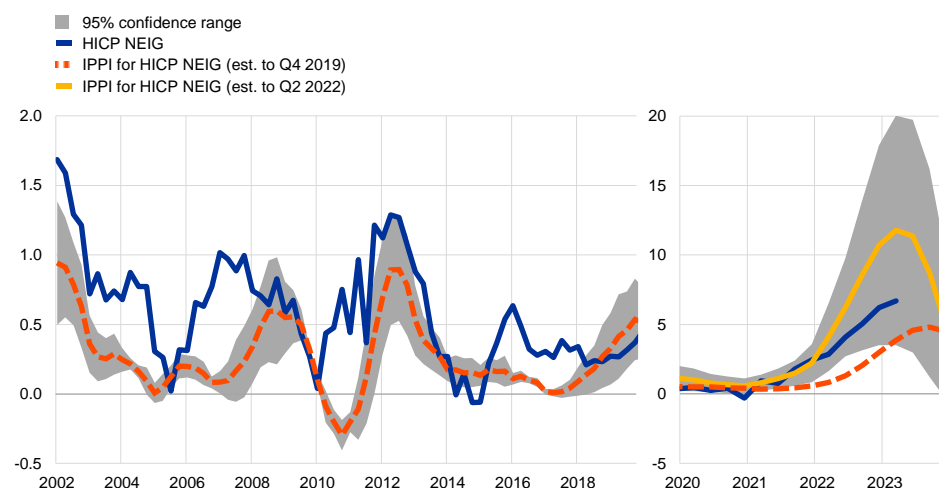
b) IPPI for HICP food

(annual percentage changes)

- 95% confidence range
- HICP food
- IPPI for HICP food
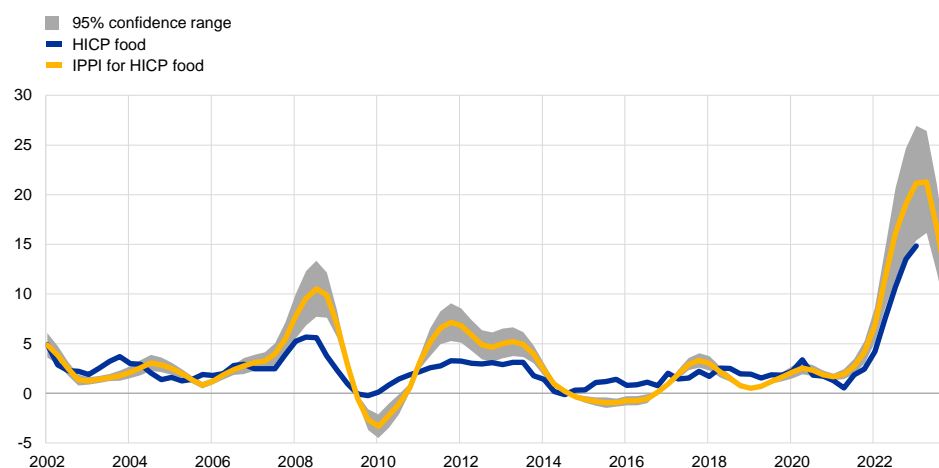
Sources: Eurostat, ECB calculations.
Notes: The latest observations are for Q1 2023 for HICP and Q4 2023 for IPPI (derived using PPI data for Q1 2023, which refer to the average for January and February). The IPPI is derived using elasticities over an eight-quarter period obtained with the LP estimation method. The LP estimation method yields elasticities for a change in consumer prices with respect to the change in producer prices. To obtain the IPPI these elasticities are transformed to an impact on the annual inflation rates of an index. Afterwards, for a given change in PPI the impact on consumer prices is calculated for the next seven quarters (taking the quarter-on-quarter change in PPI and multiplying this by the time profile of the impacts). Thereafter, the paths for changes in the PPI from the eight preceding consecutive quarters are added together to obtain the joint impact on consumer prices in a given quarter. For panel a) the IPPI indicator based on the estimation sample until the end of 2019 (red line) is also derived for the period afterwards, in order to show the differences due to changes in elasticities when the indicator is obtained based on an extended sample (yellow line). The 95% confidence range refers to the IPPI based on LP estimates until Q4 2019 in the left-hand panel, and to the IPPI estimated until Q2 2022 in the right-hand panel. The IPPI in panel b) is obtained by using the higher responses of consumer food prices to changes in producer prices after PPI increases as opposed to PPI declines (the path for the impacts on consumer prices over eight quarters from a one-quarter change in PPI is obtained by multiplying higher elasticities when the change in PPI is positive and lower elasticities when the change is negative).

Overall, IPPIs can help to assess the strength and direction of the underlying pressures on NEIG and food prices. However, a number of caveats should be considered when analysing these indicators. Although designed for generating additional information in periods like the current one, the exceptionally large swings in producer and consumer price developments lead to estimations surrounded by uncertainty. The significant rise in the response of consumer prices to PPIs when

including the last two years, especially for NEIGs, suggests that firms' pricing strategies may have changed towards faster pass-through and less buffering through profits when responding to the extraordinary size and length of recent cost shocks (as indicated by the gap between the red and yellow lines in Chart C, panel a). Continuous monitoring of the relationship between PPIs and consumer prices is warranted. IPPIs are, by construction, backward-looking indicators, because they are based on developments in PPIs only up until their latest observation. If PPIs were to decline over the next few quarters, the IPPIs would also adjust downwards accordingly. More generally, the IPPIs should not be assessed in isolation, but always alongside all other information as regards underlying price pressures in the economy.

6 A model-based assessment of the macroeconomic impact of the ECB's monetary policy tightening since December 2021

Prepared by Matthieu Darracq-Paries, Roberto Motto, Carlos Montes-Galdón, Annukka Ristiniemi, Arthur Saint Guilhem and Srečko Zimic

The monetary policy normalisation that started in December 2021 has taken the ECB's policy stance from a highly accommodative position into restrictive territory. In December 2021 the ECB announced that it would begin normalising its policy stance by slowing the pace of net asset purchases, with net purchases under the pandemic emergency purchase programme (PEPP) and the asset purchase programme (APP) eventually ending in March 2022 and June 2022 respectively.[1] The ECB's interest rate guidance was revised in June 2022, and its key policy rates were increased by a total of 350 basis points between July 2022 and March 2023, rapidly tightening policy and ultimately taking rates into restrictive territory. While the speed and magnitude of this tightening is high from a historical perspective, monetary policy is transmitted to the economy with lags, implying that the full impact of the tightening will unfold over the next few years. This box uses a variety of empirical macroeconomic modelling frameworks to illustrate the impact on economic activity and inflation in the euro area.

Uncertainty about the impact of monetary policy on the economy can be addressed by drawing on a suite of models. This box presents details of a stylised exercise analysing the impact of policy tightening so far and illustrates the analytical challenges that surround such an assessment. There are two main challenges in assessing the impact of policy tightening. First, financial and macroeconomic variables are driven by a host of factors on both the demand side and the supply side. These factors need to be disentangled from the impact of monetary policy itself, calling for a model-based identification approach. And second, there is uncertainty regarding the transmission channels and lags of monetary policy, and it is therefore necessary to consider alternative methodologies with different transmission mechanisms in the interests of robustness. For these reasons, this assessment uses a suite of models: two structural DSGE models (NAWM II and

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[1] Furthermore, in December 2022 the ECB announced its intention to reduce the size of the APP portfolio by not reinvesting some of the principal payments from maturing securities. The APP portfolio will decline by €15 billion per month on average until the end of June 2023, and the Governing Council expects to discontinue all reinvestments thereafter.

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MMR) and one large-scale semi-structural model (ECB-BASE).[2] This approach is in line with the conclusions of the ECB's recent monetary policy strategy review, which emphasised the importance of robustness in carrying out model-based analyses within the Eurosystem.[3]

The assessment is carried out in two steps: first, by estimating the impact that monetary policy has on the yield curve, and second, by translating the impact on the yield curve into macroeconomic effects using macro models. The first step is to identify monetary policy-induced changes in short and long-term interest rates. The impact on short-term rates is calibrated on the basis of the upward shift observed in the forward curve for the euro short-term rate (€STR) at short to medium maturities since December 2021, which reflects both actual increases in policy rates and the anticipation of future increases. The impact on long-term rates is derived from the upward pressure on yields that is exerted by revisions to expected APP and PEPP holdings. In a second step, the policy-related effects on interest rates and the Eurosystem's balance sheet are translated into macroeconomic effects using the suite of macro models, either directly or indirectly via the impact that balance sheet expectations have on long-term rates.[4] In the DSGE models, the conditioning on the short-term interest rate is done through monetary policy shocks, which are partially anticipated in MMR and unexpected in NAWM II. In the ECB-BASE model, short and long-term interest rates are assumed to be exogenous and the counterfactual is imposed as an alternative path relative to the baseline (i.e. the interest rate path expected in December 2021). In practice, market-based financial assumptions also change as an endogenous reaction to other drivers, such as energy prices. In order to compute the impact of monetary policy, this exercise quantifies the macroeconomic impact of policy had it not followed the historical regularities captured by market-based financial assumptions. This counterfactual is computed using policy shocks. Sensitivity to these assumptions is explored in more detail later in the box, particularly as regards the role of the expectation formation process.

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[2] For details of the NAWM II model, see Coenen, G., Karadi, P., Schmidt, S. and Warne, A., "The New Area-Wide Model II: an extended version of the ECB's micro-founded model for forecasting and policy analysis with a financial sector", *Working Paper Series*, No 2200, ECB, November 2018 (revised December 2019); for information on the MMR model, see Mazelis, F., Motto, R. and Ristiniemi, A., "Monetary policy strategies for the euro area: optimal rules in the presence of the ELB", *Working Paper Series*, No 2797, ECB, March 2023; for details of the ECB-BASE model, see Angelini, E., Bokan, N., Christoffel, K., Ciccarelli, M. and Zimic, S., "Introducing ECB-BASE: The blueprint of the new ECB semi-structural model for the euro area", *Working Paper Series*, No 2315, ECB, September 2019. NAWM II is a fully micro-founded small open economy model with (i) an explicit intertemporal substitution channel, (ii) a banking sector with a financial accelerator mechanism, (iii) central bank asset purchases, (iv) interest rate-sensitive investment decisions and (v) a foreign economy block allowing for international spillovers. The MMR model is a closed economy DSGE model with (i) optimising households and firms, (ii) central bank asset purchases and (iii) a time-varying neutral interest rate. It also estimates the degree of attention to central bank communication, thereby helping to address the forward guidance puzzle encountered in standard DSGE models. ECB-BASE is a large semi-structural model designed to combine theoretical considerations with a good empirical fit and a comprehensive structure, reflecting its role as a workhorse model in the context of projections and policy simulations at the ECB. Its monetary policy transmission mechanism is stronger than in standard semi-structural models, thanks to the explicit (VAR-based) role played by expectations and a multitude of financial channels.

[3] See "Review of macroeconomic modelling in the Eurosystem: current practices and scope for improvement", *Occasional Paper Series*, No 267, ECB, September 2021.

[4] Both structural models capture asset purchases directly via the inclusion of the central bank's balance sheet. In the ECB-BASE model, asset purchases are captured indirectly via their effect on long-term rates, so the impact of monetary policy normalisation is computed using both short and long-term interest rates.

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The results show that the policy tightening can be expected to exert substantial downward pressure on real activity and inflation over the period 2023-25. Since December 2021, short-term interest rates have increased by around 270 basis points on average over the projection horizon 2022-25. Expectations for long-term interest rates, which account for anticipation, have increased by around 230 basis points over the same horizon (a significant percentage of which can be attributed to changes in APP and PEPP expectations, as Table A shows).[5] Short-term interest rate expectations began shifting upwards even before the first policy rate increase in July 2022 (Chart A), which shows the importance of accounting for policy expectations. The associated upward shift in the yield curve has an effect, in turn, on broader financing conditions and exerts a tangible impact on the economy. Averaging results across the three models, this assessment suggests that policy normalisation has exerted significant downward pressure on inflation and real GDP growth across the whole of the projection horizon (Chart B). Most of the impact on inflation is expected to be seen in the period from 2023 onward, with that impact peaking in 2024. The tightening of policy is estimated to have lowered inflation by around 50 basis points in 2022, while the downward impact on inflation is expected to average around 2 percentage points over the period 2023-25, with estimates differing substantially across the three models. The transmission to economic activity is faster, with the impact on GDP growth expected to peak in 2023 and a downward impact of 2 percentage points on average over the period 2022-25.[6] [7]

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[5] The impact that monetary policy has on short-term rates is computed on the basis of the upward shift observed in the forward curve for the €STR over the 2022-25 horizon. As increases in policy rates are typically transmitted one-to-one to the overnight rate, it is assumed that all changes in the €STR forward curve can be attributed to the tightening of policy. For long-term rates, the tightening impact stems from changes in expectations regarding balance sheet reduction. The impact of the latter is computed by mapping changes in balance sheet expectations derived from the Survey of Monetary Analysts into yields using an average across two models: (i) a term-structure model with a quantity variable and duration risk (see Eser, F., Lemke, W., Nyholm, K., Radde, S. and Vladu, A., "Tracing the impact of the ECB's asset purchase programme on the yield curve", *Working Paper Series*, No 2293, ECB, July 2019); and (ii) a large BVAR model where the impact of policy is identified using a dense event study (see Rostagno, M., Altavilla, C., Carboni, G., Lemke, W., Motto, R. and Saint Guilhem, A., "Combining negative rates, forward guidance and asset purchases: identification and impacts of the ECB's unconventional policies", *Working Paper Series*, No 2564, ECB, June 2021). The exchange rate is allowed to move endogenously.

[6] In all models, monetary policy is neutral in the long run. This implies that GDP growth will eventually turn positive after the initial negative impact. This happens earlier with the MMR model, as the exercise is conducted with expected shocks, hence the impact of policy is more frontloaded. This is illustrated in Chart C, which shows that, when shocks are unexpected, the profile of GDP growth is more similar to those of the other models.

[7] The May 2023 median expectations for the ECB's balance sheet tightening are broadly consistent with the discontinuation of reinvestments under the APP programme as of July 2023. The tightening of balance sheet expectations is expected, on its own, to lower annual inflation by slightly more than 10 basis points in each year over the period 2023-25 and reduce GDP growth by the same amount over the period 2022-25.

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Table A

Impact on short and long-term rate assumptions over the horizon 2022-25

(basis points)

	Impact of policy normalisation up to Mar./May 2023
Short-term interest rates	91 in 2022
	373 in 2023
	336 in 2024
	277 in 2025
Yields on ten-year euro area government bonds – actual changes	228
of which: changes to APP and PEPP expectations	55

Sources: Bloomberg, Refinitiv and ECB calculations.
Notes: The impact on short-term interest rates is calculated as the average difference between the short-term interest rates expected in the December 2021 and March 2023 MPE projections. The short-term interest rate curve is based on monetary policy-dated €STR forward contracts. The impact on ten-year yields is computed on the basis of changes to balance sheet expectations in the Survey of Monetary Analysts. The estimated impact on ten-year yields in the period from October 2021 (in order to account for anticipation) to May 2023 is around 65 basis points, while the average impact on expected ten-year yields over the period from 2022 to 2025 is 55 basis points. The impact is computed as the average across two models: a term-structure model (see Eser et al., op. cit.) and a BVAR model (see Rostagno et al., op. cit.).

Chart A

Impact on the monetary policy-dated €STR forward curve

(percentages per annum)

- December 2021
- March 2022
- June 2022
- September 2022
- December 2022
- March 2023
- DFR
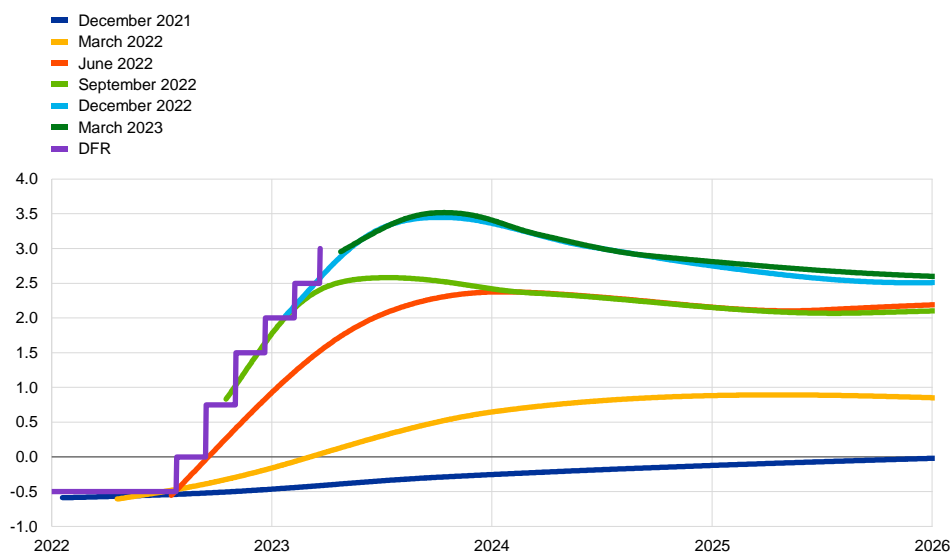
Sources: Bloomberg and ECB calculations.
Notes: This chart shows, for each Governing Council monetary policy meeting with updated economic projections, the €STR forward curve on the first available day of the maintenance period that follows the meeting. The purple line represents realised values for the deposit facility rate (DFR), with data being adjusted for the DFR space by applying a spread of 8 basis points. The cut-off dates for the data used for the various lines are based on the following final cut-off dates for projections: 23 November 2021 (December 2021), 28 February 2022 (March 2022), 17 May 2022 (June 2022), 22 August 2022 (September 2022), 25 November 2022 (December 2022) and 15 February 2023 (March 2023).

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Chart B

Impact of monetary policy tightening according to a suite of models

(percentage points)

- ■ ECB-BASE
- ■ NAWM II
- ■ MMR
- ● Mean

a) HICP inflation

b) Real GDP growth
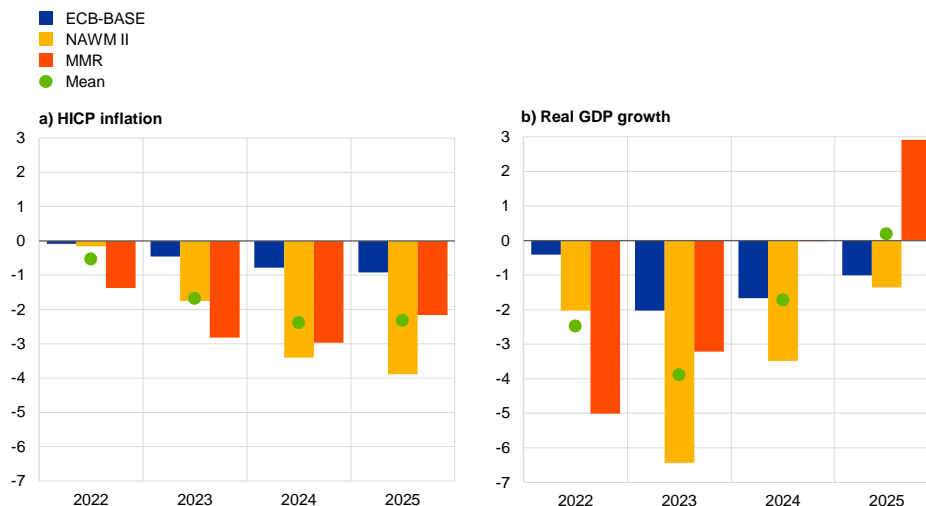
Source: ECB calculations based on the NAWM II model (see Coenen et al., op. cit.), the MMR model (see Mazelis et al., op. cit.) and the ECB-BASE model (see Angelini et al., op. cit.).
Notes: This chart reports the results of a simulation involving changes to short-term rate expectations between December 2021 and March 2023 and changes to expectations regarding the ECB's balance sheet between October 2021 and May 2023. The reported values refer to year-on-year growth rates. "Mean" denotes the average across the three models.

The impact estimates are surrounded by significant uncertainty, reflecting differences in transmission channels across models, with the structural models displaying a stronger impact. The structural models are specifically designed for the purpose of deriving conditional correlations between identified monetary policy impulses and macroeconomic aggregates, while semi-structural models seek to achieve a satisfactory combination of identification and empirical fit. This can result in monetary policy tightening having a more limited impact, as the estimated impact based on such models probably conflates the effect of a "pure" monetary policy impulse with that of other non-policy drivers. In practice, there is a trade-off between the scale of the model and the number of drivers that can be identified, as abstracting from many of the cross-equation restrictions required for full structural identification allows a richer model structure (e.g. as regards consumption). In the DSGE models used for the simulations, consumption is closely linked to expected future short-term rates via the Euler equation. On the other hand, the richer modelling of consumption in the ECB-BASE model includes individual income risk and differing propensities to consume out of different income sources.[8] This implies that the dynamics of consumption are less dependent on expected short-term interest rates but better capture the observed persistence in consumption.

The larger impact of monetary policy in structural models also reflects stronger expectation channels. In particular, while structural models are forward-looking, semi-structural models typically involve more backward-looking expectations, resulting in slower propagation of shocks.[9] Similarly, in DSGE models,

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[8]   In contrast, there are fewer differences between ECB-BASE and the two DSGE models in terms of the modelling of the investment sector, with ECB-BASE featuring a financial accelerator mechanism.

[9]   In the ECB-BASE model, expectations are modelled using VARs.

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an endogenous fall in inflation expectations in response to a rate rise leads to a further increase in real rates, thereby creating a reinforcing loop – a channel that is not present in semi-structural models, as these do not directly incorporate expectations of future inflation. This role played by expectations can be illustrated using sensitivity analysis. If it is assumed that agents do not anticipate policy decisions, the impact that the normalisation of policy has on inflation is halved in the MMR model (pale red bars in Chart C), bringing its estimates closer to those derived from the ECB-BASE model. Likewise, in the case of the NAWM II model, if the forward-looking expectations mechanism is modified to incorporate an adaptive learning scheme that makes households and firms' expectations more backward-looking, the impact that monetary policy has on inflation is mitigated (pale yellow bars in Chart C). Conversely, using more reactive expectations and strengthening the impact that asset prices have on the valuation of wealth in the ECB-BASE model (pale blue bars in Chart C) brings its responses closer to those produced by the two DSGE models under a tempered expectations channel.[10]

Chart C
Sensitivity to the expectation formation process

(percentage points)

- ECB-BASE
- ECB-BASE – reactive
- NAWM II
- NAWM II – adaptive
- MMR
- MMR – no anticipation
- Mean

a) HICP inflation

b) Real GDP growth
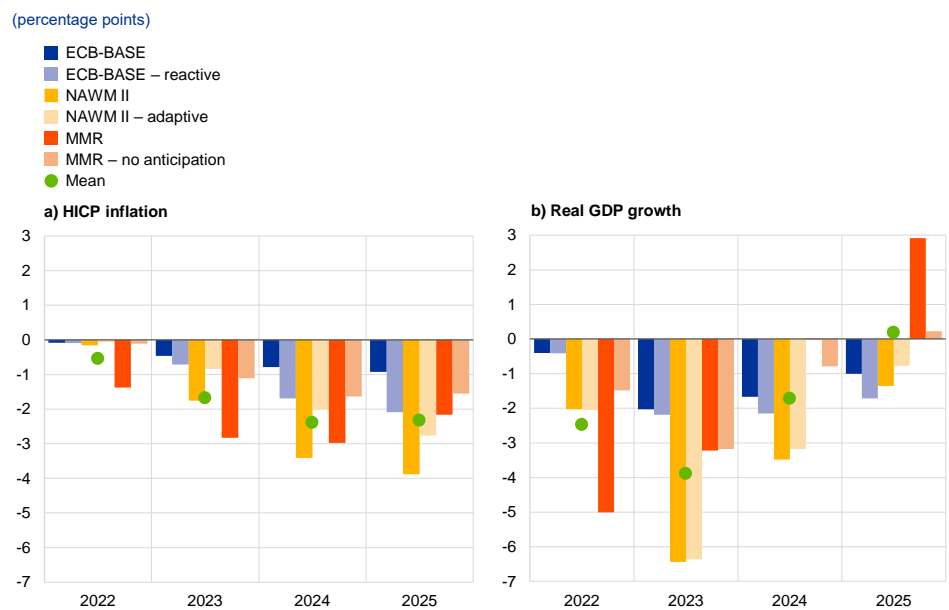
Source: ECB calculations based on the NAWM II, MMR and ECB-BASE models.
Notes: The reported values refer to year-on-year growth rates. "Mean" denotes the average across all three models using the standard expectations channel in each model, and is therefore equivalent to the mean in Chart B.

This model-based assessment can serve as a useful cross-check, but is no substitute for a data-dependent approach to the setting of policy and the monitoring of transmission over time. First, the current situation is characterised by exceptionally high levels of uncertainty about economic relations. The pandemic,

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10 More reactive expectations are obtained by increasing the elasticity of short-term inflation expectations relative to movements in interest rates (whereby greater elasticity is obtained by estimating the underlying VAR used for expectation formation using a different sample and an OLS estimator) and by allowing actual inflation developments to have a stronger effect on the perceived long-term inflation target. The impact that asset prices have on the valuation of wealth is strengthened by endogenising house prices and by increasing the elasticity of the revaluation term in financial wealth relative to movements in returns on financial assets.

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the large energy shock, the fiscal responses to those two events and the unprecedented pace of the tightening of monetary policy are all likely to affect economic decisions and structures in ways that go beyond the historical regularities captured by available models. This uncertainty is compounded by the fact that macroeconomic outcomes reflect shocks from many different sources beyond monetary policy, and those shocks will propagate differently across the various models. Second, these estimates do not capture the prevention of any adverse non-linear dynamics that might have materialised in the absence of monetary policy tightening, such as a risk of destabilising inflation expectations. Finally, the results point to considerable lags in the transmission of monetary policy to the economy. For all those reasons, while this model-based assessment can serve as a complementary cross-check, it is necessary to monitor indicators such as financial and credit variables, as well as leading indicators of activity and prices, to establish a timely and comprehensive medium-term inflation outlook.

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7 Government expenditure in the euro area during the pandemic crisis – insights from the Classification of the Functions of Government data

Prepared by Marta Rodríguez-Vives and Hans Olsson

On 22 February 2023 Eurostat released the 2021 data on general government expenditure according to the Classification of the Functions of the Government (COFOG). This dataset covers all EU Member States over the period from 1995 to 2021. The data are published annually with a time lag of around 14 months, and provide insights into the composition of public expenditure in the EU and the euro area. Notably, the COFOG data regroup national accounts spending data according to similar economic government objectives, thus improving its comparability across countries.[1] The ratio of euro area public expenditure to GDP increased substantially in recent years, from 46.9% in 2019 – the pre-pandemic baseline – to 52.6% in 2021 and to 50.7% in 2022. In the light of the high magnitude of public expenditure in the euro area, as well as the multiplicity of organisational and institutional settings in public administration, COFOG data provide valuable information on common and divergent trends in governmental actions across countries. Against this background, this box provides an overview of the functional composition of government spending in the euro area and across euro area countries in 2021. The effect of the COVID-19 pandemic on government spending is also discussed.[2]

Although expenditure on different government functions is heterogeneous across countries, some common trends emerge. Based on COFOG data, Chart A shows how the governments of euro area countries spent their budgets on different economic functions in 2021. The main function is re-distribution, with social protection being the largest component of public expenditure in all euro area countries, amounting to 21.2% of GDP on average. Pension payments represent around 60% of this expenditure on average. The second most important category is health expenditure, which accounts for 8.3% of GDP. Other key functions include (i) economic affairs, which covers energy, transport infrastructure and communication, among others; (ii) education; and (iii) general public services, which covers foreign aid, embassies, debt and tax office, among others, and is included in Chart A under the category of "other". Government expenditure on defence accounted for around 1.3% of GDP in the euro area in 2021.

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[1] For instance, a government can effect direct expenditure (e.g. on housing) that benefits part of the population, or it can provide target groups with earmarked subsidies or make their private expenditure tax deductible. As such, government expenditure data could vary considerably when using the standard national accounts classification. In the COFOG data, however, such arrangements would be classified together under the housing function. For more details, see the article entitled "Social spending, a euro area cross-country comparison", *Economic Bulletin*, Issue 5, ECB, 2019.

[2] While a significant effort has been made to harmonise the recording of government measures intended to mitigate the economic and social impact of the COVID-19 pandemic, a full harmonisation of data for the reference years 2020 and 2021 has not yet been achieved. The likelihood of future revisions is higher than usual, and data are provisional. For more details, see "General government expenditure by function in 2021", *Eurostat*, 2023.

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Chart A

Composition of public expenditure in euro area countries in 2021

(percentage of GDP)

- ■ Social protections, excluding pensions
- ■ Pensions
- ■ Health
- ■ Economic affairs
- ■ Education
- ■ Other
- ■ Defence
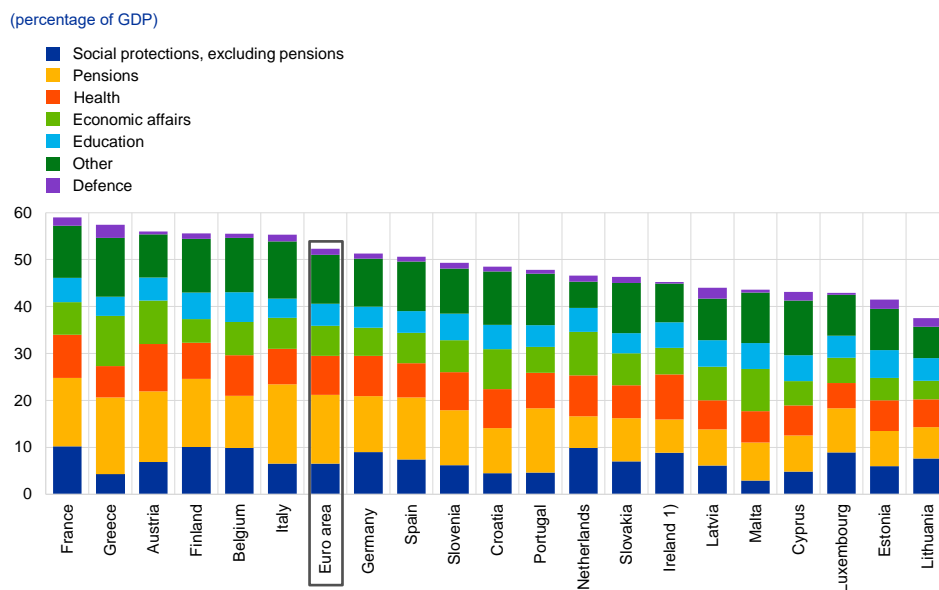
Source: Eurostat.
Notes: Pensions include old age and survivors' pensions. "Other" includes general public services, public order and safety, environmental protection, housing and community amenities, as well as recreation, culture and religion. The euro area aggregate includes Croatia. In Ireland, government expenditure is measured in percentage of GNI*, a modified measure of gross national income.
1) Percentage of GNI*.

The main shifts in the composition of public finances during the COVID-19 pandemic crisis occurred in the categories of economic affairs, social protection and health. Chart B provides an indication of the changes in government expenditure on key functions across the euro area and in the four largest euro area economies in 2021 compared with 2019. It is important to note that changes in the composition of public finances in this period were affected by the policies implemented by individual governments to stabilise their respective economies following the COVID-19 shock. Governments adopted substantial fiscal packages in 2020 and 2021 to support households and firms,[3] and such interventions are reflected in the COFOG data. Compared with 2019, government expenditure on economic affairs increased by 2.3 percentage points of GDP in 2021, mainly due to furlough schemes and other support offered to firms. These support measures fall under general economic, commercial and labour affairs – a subcategory of economic affairs – which increased by 1.4 percentage points of GDP.[4] Chart B also illustrates that expenditure on social protection and public health increased remarkably in euro area countries, primarily as a direct consequence of the COVID-19 crisis. In fact, the

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[3]   The fiscal support in the euro area (mostly on the expenditure side) amounted to around 4% of GDP in 2020 and 2021, of which approximately two-thirds consisted of direct support to firms and employees. For details, see the article entitled "The role of government for the non-financial corporate sector during the COVID-19 crisis", *Economic Bulletin*, Issue 5, ECB, 2021.

[4]   The economic affairs category is influenced by operations of an extraordinary nature, such as capital injections recorded as capital transfers, which notably benefitted non-financial corporations during the COVID-19 pandemic, and the subsidies granted to producers, including furlough schemes recorded as subsidies to the employer as well as other subsidies introduced in the context of the COVID-19 pandemic.

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ratio for public health services in 2021 is the highest in the available data series.[5] In the case of social protection, part of its recent growth in expenditure is due to unemployment benefits, although there are differences in their shares across countries due to accounting reasons.[6] Although not directly related to the COVID-19 crisis, expenditure on pensions, which falls under social protection, increased by an average of around 0.8 percentage points of GDP, with strong differences across countries. Importantly, shares in education and environmental protection generally remained stable from 2019 to 2021. This is of particular importance given the relative economic growth-friendly nature of these expenditure categories.[7] These developments from 2019 to 2021 differ from those during the global financial crisis, when governments reduced expenditure on education and health through cuts to employee compensation, especially in the period from 2011 to 2013.

Chart B

Changes in the functional composition of government expenditure 2019-21 (euro area and the euro area big four: Germany, France, Italy, and Spain)

(cumulative changes, percentage points of 2019 GDP)

- Total expenditure
- Economic affairs
- Of which general economic, commercial and labour affairs
- Health
- Education
- Social protection
- Of which unemployment
- Of which pensions
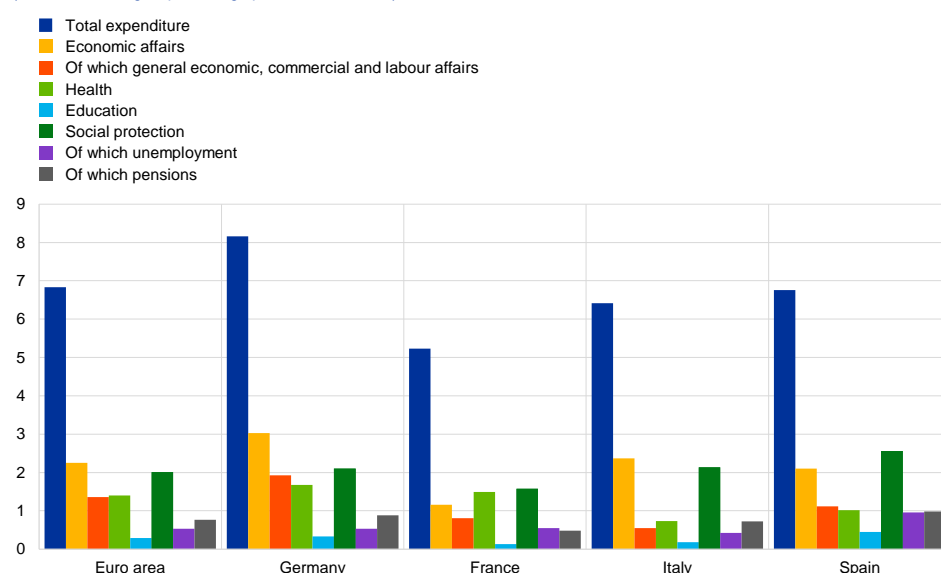
Source: Eurostat.
Notes: A breakdown of economic affairs is provided to reflect the support given to firms and labour (e.g. through job retention schemes). Likewise, social protection is broken down to show pensions (old age pensions and survivors' pensions) and unemployment benefits. The amounts relating to furlough schemes provided during the COVID-19 crisis were generally classified under unemployment benefits in the COFOG data, but also sometimes under general economic, commercial and labour affairs. The euro area aggregate includes Croatia.

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[5] The COFOG health category covers medical products, appliances and equipment, outpatient services, hospital services and public health services, as well as research and development related to health. The high health expenditure reported in 2021 is due to, among other things, the COVID-19 pandemic (with increased spending on related treatments, personal protective equipment and vaccines) and the fact that more people were seeking regular treatment unrelated to COVID-19 in 2021 compared with 2020.

[6] Depending on the design of the furlough schemes, the amounts provided during the COVID-19 crisis were generally classified under unemployment benefits in the COFOG data, but also sometimes under general economic, commercial and labour affairs.

[7] The quality of public expenditure is related to the concept of a budget composition that ideally promotes long-term output growth, while also preserving certain levels of equity in the income distribution. This includes advocating for growth and equity-friendly fiscal instruments, such as health or education. For more details, see Rodríguez-Vives, M., "The quality of public finances: where do we stand?", *Economics and Business Letters*, Vol. 8, No 2, 2019, pp. 97-105.

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In view of strains on public finances, choices on how to better allocate public resources are becoming even more important in the making of fiscal policy, and the availability of data remains fundamental. At the current juncture, some governments are facing more constraints (e.g. a higher stock of public indebtedness, the growing effects of ageing populations on public finances) and new economic challenges are weighing on public finances (e.g. digitalisation trends, climate change, deglobalisation trends, increasing allocations for defence expenditure). This will increase the importance of improving the growth-friendliness of public finances.[8]

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[8]   For example, the new G20 Data Gaps Initiative calls for an improvement to data availability and data provision regarding climate change.

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8 EUROPOP2023 demographic trends and their euro area economic implications

Prepared by Maximilian Freier, Benoit Lichtenauer and Joachim Schroth

The recent coronavirus (COVID-19) pandemic and the influx of migrants are leaving a mark on the demographic outlook for the euro area, with implications for the long-term economic outlook. This box reviews the demographic trends derived from the latest EUROPOP2023 population projections, which were published by Eurostat on 30 March 2023. These projections cover the size and structure of the population of all EU Member States for the period 2022-2100. Revisions in the demographic projections are driven by recent changes in birth rates, mortality rates and migration flows. In view of the long-term horizon, the projections are surrounded by a high degree of uncertainty. This box focuses on revisions compared with the previous update of the population projections, which were released in 2019, and their impact on economic growth prospects and fiscal sustainability in the euro area.[1]

In line with previously expected long-term trends, the euro area's population is projected to continue ageing and to shrink significantly over the coming generations. According to Eurostat's updated projections, the euro area population is expected to decrease by 4.5% between 2022 and 2100, equivalent to 16 million fewer people, with the decline particularly pronounced in some countries (Chart A). Owing to the ageing population, the fall in the euro area's working-age population (persons aged between 15 and 64) will be more severe than that of the overall population. The number of people of working age is expected to drop by 19%, from 221 million in 2022 to 180 million in 2100. This will lead to a rapid increase in the old-age dependency ratio, from 34% in 2022 to around 51% in 2050 and 60% in 2100 – that is, from one elderly person for every three working-age people in 2022 to just under two elderly people in 2100.

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[1] EUROPOP2023 population projections are deterministically calculated based on the assumption of the continuation of current trends, as well as a partial convergence to the EU average. Revisions are mainly made on account of a function of three demographic events: births, deaths and migratory flows, each of which shapes the population structure over time. Cf. "Population projections in the EU - methodology", Eurostat (2023). Some revisions may also be on account of changes in the projection methodology.

Chart A

Demographic projections for the euro area

(index 100 = population in 2022)

- Euro area
- Germany
- France
- Italy
- Spain
- Small countries gaining population
- Small countries losing population
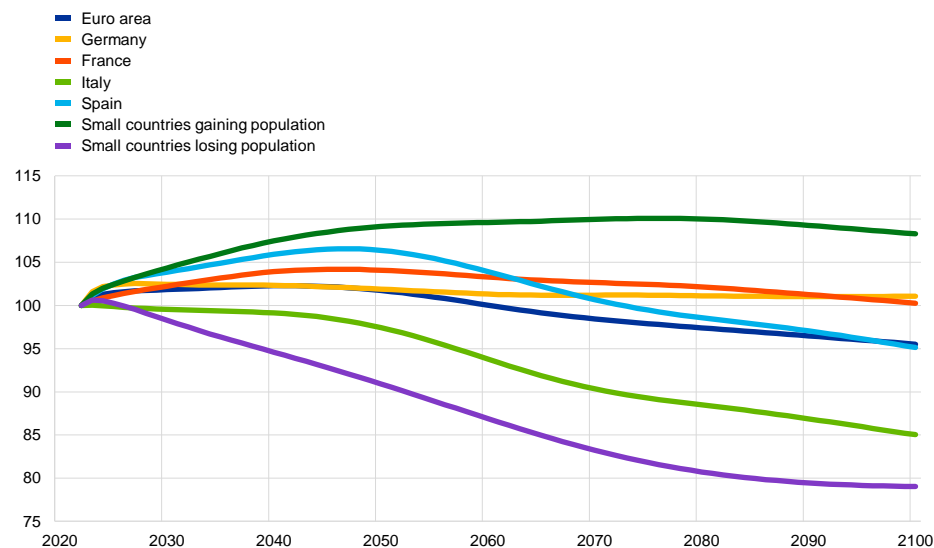
Source: Authors' own calculations based on Eurostat data.
Notes: Demographic outlook based on EUROPOP2023 demographic projections. Total population corresponds to the population on 1 January of each year, as reported in the Eurostat annual demographic statistics data collection. "Small countries gaining population" refers to the population-weighted average of Belgium, Ireland, Cyprus, Luxembourg, Malta, the Netherlands and Austria (these countries' populations are expected to grow between 2022 and 2100). "Small countries losing population" refers to the population-weighted average of Estonia, Greece, Croatia, Latvia, Lithuania, Portugal, Slovenia, Slovakia and Finland (these countries' populations are expected to shrink between 2022 and 2100).

The pandemic and the influx of migrants have affected the demographic outlook for the euro area relative to the 2019 population projections in different ways, with a positive net impact. The euro area population, including Croatia, is projected to rise from 347 million in 2022 to a peak of 355 million in 2041 – four years later than previously projected. The euro area population is now expected to be 0.7% larger in 2025 and 1.4% larger at the 2050 horizon than previously projected. The bulk of revisions in demographic trends is accounted for by much stronger net immigration, from Ukraine and other countries (Chart B). Net migration is projected to normalise by 2025 but remain slightly above the level of the EUROPOP2019 estimates throughout the projection horizon.[2] As most migrants are of working age, this tends to ease demographic pressures on labour supply and public finances. At the same time, the pandemic has significantly increased the mortality rate in euro area countries, particularly among the elderly.[3] These developments outweigh the adverse effect of the pandemic on fertility rates in most

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[2]   The upward revision to net immigration is derived from mechanical assumptions based on past migration and motivated by factors including expected migration flows triggered by climate change. For Ukrainians under temporary protection, a gradual return of two thirds of this population over ten years from 2025 onwards is assumed.

[3]   With ever-increasing life expectancies, mortality rates have been on a downward trend over time in the EU. COVID-19 caused a sudden, temporary decline in life expectancy in the EU, from 81.3 years in 2019 to 80.1 years in 2021. Cf. "The impact of demographic change in a changing environment", European Commission, 2023. Mortality rates are assumed to gradually converge to the previous path of declining mortality rates of Eurostat's EUROPOP2019 projections.

countries.[4] Taking into account all the different recent developments, the old-age dependency ratio is projected to improve by 0.6 percentage points by 2025 and 1.4 percentage points (to 51%) by 2050 relative to the 2019 projections. Some euro area countries have benefited more from these recent demographic developments than others (Chart C).[5]

Chart B

Revisions in the demographic outlook for the euro area

(in millions)
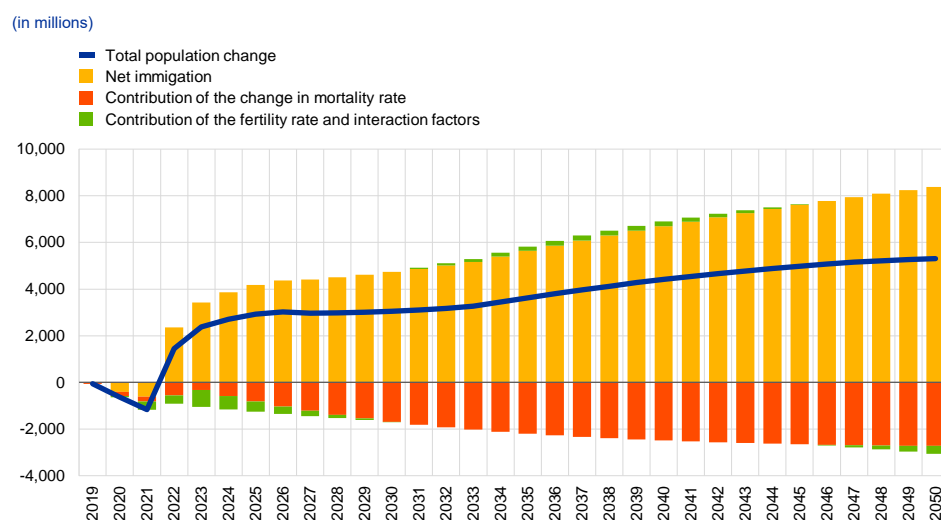
Source: Authors' own calculations based on Eurostat data.
Notes: Revised demographic outlook calculated as the difference between the EUROPOP2019 and EUROPOP2023 demographic projections. The change in total population combines net immigration and the natural population change. The natural population change is the difference between the number of live births and deaths during a given period.

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[4] Although fertility rates had largely recovered in most countries by the end of 2021, the latest EUROPOP projections entail smaller increases in fertility rates over the horizon than previously assumed, which are partially compensated over time by the stronger population growth from immigration.

[5] The demographic projections have been revised most favourably for Lithuania, where the population is now projected to grow rather than shrink at the 2025 horizon. By 2050, the population is now expected to increase in Luxembourg by 39% (+20 percentage points) and in Malta by 43% (+15.0 p.p.). In contrast, other countries are now expected to suffer a weaker population dynamic. Cumulative population growth projections over the next 30 years have been revised down to 9% for Cyprus (-7.0 p.p.) and to -14% in Greece (-5.0 p.p.). The change in the demographic outlook is reflected in a somewhat less bleak projection for the old-age dependency ratio in many countries. By 2050, the ratio has been revised down to 34% in Malta (-6.0 p.p.) and 36% in Luxembourg (-5.6 p.p.). At the same time, the projection for the ratio has been revised up to 38% in Cyprus (+3.0 p.p.) and 68% in Greece (+5.3 p.p.).

Chart C

Projections for old-age dependency ratios in euro area countries

(percentages)

- ■ 2025
- ■ 2050
- ■ 2100
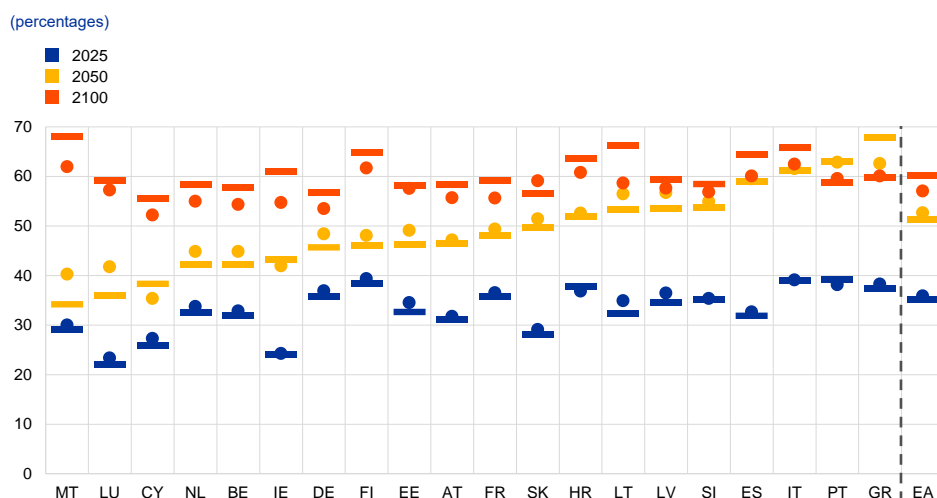
Source: Authors' own calculations based on Eurostat data.
Notes: Bars show old-age dependency ratios according to EUROPOP2023 demographic projections. Markers show old-age dependency ratios according to EUROPOP2019 demographic projections. Countries ranked according to the 2050 old-age dependency ratio in the EUROPOP2023 demographic projections. The old-age dependency ratio is defined as the number of persons aged 65 and over per 100 working-age persons (aged 15-64).

The improved demographic outlook relative to EUROPOP2019 is expected to have some positive impact on the growth outlook for the euro area over the next 30 years. An ageing and shrinking population has negative repercussions for the economic outlook through various channels.[6] In particular, it is expected to hold back potential output growth, primarily through a shrinking labour supply and possibly through other components of potential growth like labour productivity growth. A relative increase in the number of older workers within the workforce, combined with an observed hump-shaped profile of age-specific productivity, would yield a downward impact on potential output. However, structural changes, such as a higher share of occupations that can be performed at a higher age, also shift the age-specific productivity profile. Furthermore, as ageing also affects labour productivity via other channels such as physical and human capital accumulation and consumption patterns, the overall impact on aggregate productivity is not clear.[7] The demographic outlook may also have far-reaching implications for the conduct of monetary policy through its impact on the natural rate of interest and inflationary pressures.[8] The somewhat more positive outlook for euro area demographics is expected to alleviate these pressures to some degree.

At the same time, the improved demographic outlook is also likely to ease the cost-of-ageing pressures on public finances. The 2021 Ageing Report shows that age-related expenditure – public expenditure for pensions, healthcare, long-term care and education – is projected to increase by 2.4 percentage points under the

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[6]   See the box entitled "The impact of the influx of Ukrainian refugees on the euro area labour force", *Economic Bulletin*, Issue 4, ECB, 2022.

[7]   See Bodnár., K. and Nerlich., C., "The macroeconomic and fiscal impact of population ageing", *Occasional Paper Series*, No 296, ECB, Frankfurt am Main, June 2022.

[8]   See Goodhart, C. and Pradhan, M., *The Great Demographic Reversal: Ageing Societies, Waning Inequality, and an Inflation Revival*, Palgrave Macmillan, 2020.

reference scenario, from around 24.6% of euro area GDP in 2019 to over 27% in 2050.[9] The rise is mainly due to increased expenditures for health and long-term care, while pension expenditure increases are contained as a result of past pension reforms, including measures reducing the benefit ratio and increasing the retirement age.[10] According to EUROPOP2023, the more benign demographic outlook is expected to somewhat ease the pressure on age-related expenditures. The higher mortality rate stemming from the pandemic had adverse consequences in the short term but will reduce future needs for health and long-term care, as it primarily affected the elderly population. At the same time, the migration of working-age people into EU Member States improves the old-age dependency ratio and reduces the funding pressure on pension systems.

Model-based estimates suggest a small positive impact on potential GDP growth and public finances over the next decades. Results are obtained from running the overlapping generations model of de la Croix and Docquier (2007), calibrated for the euro area with actual historical data and the EUROPOP2019 and EUROPOP2023 projections (Table A).[11] Simulations suggest a gain of around 0.1 percentage points compared with the EUROPOP2019 projections in potential growth per year until 2050 from the path of the population structure embedded in the revised projections. This is mainly driven by the positive impact of net immigration on the labour force. The stronger labour supply, assuming gradual integration of migrants into the labour market, also exerts a minimal downward impact on wage growth. Finally, the change in the population structure has a small favourable impact on pension expenditure, reducing it at a given pension level by 0.2-0.3 percentage points of euro area GDP until 2050.[12]

Table A

Impact of updated projections on annual real GDP growth, wages and pension expenditure

(in percentage points)

	2020	2030	2040	2050
Real growth	-0.04	0.13	0.13	0.08
Growth in compensation per employee	-0.01	-0.01	-0.01	-0.02
Pension expenditure savings	-0.04	0.20	0.32	0.32

Sources: Authors' own calculations based on de la Croix and Docquier (2007).

Overall, however, a shrinking and ageing European population continues to pose significant challenges to the euro area economy. Labour and pension market reforms should be geared towards increasing the labour force participation

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[9] European Commission, "The 2021 Ageing Report - Economic & Budgetary Projections for the EU Member States (2019-2070)", *Institutional Paper*, No 148, May 2021.

[10] In the meantime, some of the pension reforms included in the 2021 Ageing Report have been reversed and are likely to lead to more pessimistic projections for euro area age-related expenditure in the forthcoming 2024 Ageing Report.

[11] This is a computable general equilibrium model with overlapping generations of individuals. Cf. de la Croix, D. and Docquier, F., "School Attendance and Skill Premiums in France and the US: A General Equilibrium Approach", *Fiscal Studies*, Vol. 28, No 4, 2007, pp. 383-416.

[12] After 2060, with the migrants ageing and the effect of lower fertility rates becoming more important, the positive impact from the changed demographic outlook reverses and all impacts switch sign, though gradually.

rate. At the same time, governments should speed up technological progress and digitalisation, in line with the policies laid down in the national Recovery and Resilience Plans. Higher age-related expenditure and a smaller tax base in the working-age population is likely to put increasing pressure on public finances. In particular, countries that already have vulnerable public finances should refrain from rolling back past pension reforms that have significantly contributed to improving the sustainability of their pension systems. Rebuilding fiscal buffers that declined during the pandemic and energy crisis would contribute to catering for increasing health and long-term care costs.

Articles

1   The impact of Brexit on UK trade and labour markets

Prepared by Katrin Forster-van Aerssen and Tajda Spital

1   Introduction

It has been almost two and a half years since the United Kingdom signed its post-Brexit trade deal with the European Union (EU), which was expected to have multifaceted impacts on the UK economy. The EU-UK Trade and Cooperation Agreement (TCA) was signed on 30 December 2020 and came into effect provisionally on 1 January 2021. Leaving the EU's Single Market and the EU Customs Union represented a profound change in the economic relationship. This change was expected to have an impact on trade flows between the EU and the United Kingdom, but also on migration flows, foreign direct investment, regulation, the financial sector, science and education, and other areas of the UK economy.

While it will take some time for all the effects to emerge, this article focuses on recent developments in UK trade and labour markets, where the impacts of Brexit have been widely discussed. The coronavirus (COVID-19) pandemic is a confounding factor, but the available data allow a first stocktake of the effects of Brexit. While significant uncertainties regarding the precise magnitudes remain, the available evidence suggests that Brexit has been a drag on UK trade and has contributed to a fall in labour supply, both of which are likely to weigh on the United Kingdom's long-run growth potential.[1]

2   Developments in UK trade flows since the implementation of the TCA

While the pandemic and supply chain disruptions have affected trade globally over recent years, Brexit had an additional impact on UK trade. The global recession and subsequent recovery in the wake of the pandemic, together with disruptions in global supply chains, have generally increased trade volatility globally over recent years. For the United Kingdom, the extensive and drawn-out negotiations on the withdrawal arrangements and on the future trading relationship generated even greater uncertainty, as also reflected in a sharp depreciation of the country's exchange rate, which had already negatively affected investment, imports

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[1] For further discussion on the impact on potential growth, see "Monetary Policy Report", Bank of England, February 2023.

and exports during the period before the United Kingdom's formal exit from the EU.[2]
The United Kingdom's investment growth rate was low long before Brexit, which also
underlies the United Kingdom's stagnating productivity growth. Following the Brexit
referendum, a prolonged period of uncertainty about the EU-UK relationship further
dampened investment. Exports have also been affected by the reduced
attractiveness of the United Kingdom as an investment destination for foreign
companies.[3]

**Since January 2021, EU-UK trade has been governed by the EU-UK TCA, which
formalised the trade and regulatory relations.** The TCA ensures zero tariffs and
zero quotas on goods traded between the EU and the United Kingdom. To qualify for
tariff-free access, however, UK goods need to meet rule-of-origin requirements,
which are set out in detailed annexes to the TCA. Thus, unlike in the Single Market,
companies face additional administrative burdens and delays at the border owing to
customs and regulatory checks. The United Kingdom and the EU have implemented
the agreement at different speeds. While EU countries immediately applied full
customs requirements and checks on imports from the United Kingdom, the United
Kingdom delayed the introduction of full customs requirements on UK imports from
the EU until January 2022, with additional health, safety and security checks delayed
until the end of 2023.

**UK goods trading volumes with the EU fell significantly after the
implementation of the TCA, remaining below their pre-pandemic level until the
beginning of 2022.** On the import side, despite the delayed application of TCA
provisions by the United Kingdom, there was a striking decline in UK imports from
the EU over the first months of 2021, which contrasted with a rise in goods imports
from non-EU countries (Chart 1, panels a and c). This could point to some
substitution between EU and non-EU imports, with goods being redirected away
from transits via EU countries. However, different cyclical conditions during the
pandemic (owing to differences in case numbers and restrictions) and different
exposures to global supply bottlenecks may also have played a major role. As the
gap between imports from EU and non-EU partners has closed over recent months,
the impact of all these factors appears to have been rather short-lived.[4] On the
export side, UK exports to EU countries fell sharply immediately after the introduction
of the TCA, as many exporters were struggling to meet the new paperwork
requirements for documenting compliance with EU standards (Chart 1, panel b).

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[2] See, for instance, Graziano, A.G., Handley, K. and Limão, N., "Brexit uncertainty and trade
disintegration", *The Economic Journal*, Vol. 131, No 635, April 2021, pp. 1150-1185. For a review of
developments in UK import demand and the balance of payments since the referendum, see the article
entitled "Understanding post-referendum weakness in UK import demand and UK balance of payments
risks for the euro area", *Economic Bulletin*, Issue 3, ECB, 2021. Instead of benefiting from the sharp
depreciation of the pound sterling, exports also suffered, given the high uncertainty and firms'
anticipation of the need to decouple.

[3] See Driffield, N. and Karoglou, M., "Brexit and Foreign Investment in the UK", *Journal of the Royal
Statistical Society Series A: Statistics in Society*, Vol. 182, No 2, October 2018, pp. 559-582.

[4] This development, however, needs to be interpreted with some caution, as data on goods imports from
the EU were inflated in the first half of 2022 by delayed customs declarations from the second half of
2021. More generally, when interpreting recent developments in UK trade, it is important to note that in
January 2022 HM Revenue and Customs implemented a data collection change affecting data on
imports from the EU into the United Kingdom. This followed a similar data collection change in January
2021 for data on exports of goods to the EU from the United Kingdom. The Office for National Statistics
(ONS) applied adjustments to 2021 EU imports to compare import and export statistics on a like-for-like
basis. The full time series for imports from the EU still contains a discontinuity from January 2021.

Subsequently, UK goods exports to the EU recovered somewhat and have since moved broadly in line with exports to non-EU partners, although they remain relatively subdued compared with pre-Brexit trends (chart 1, panel d). Brexit thus remains a major factor. According to a recent survey by the British Chambers of Commerce of more than 1,100 businesses to mark two years since the TCA was signed, 77% of firms trading with the EU said the deal was not helping them to increase sales or grow their business. More than half of the firms reported difficulties in adapting to the new rules for exporting goods (45% for services).[5]

Chart 1

UK trade in goods with EU and non-EU countries

a) Import volumes

(index: 2019=100, monthly data)
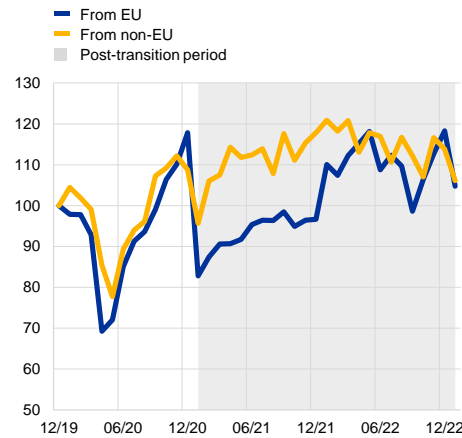
b) Export volumes

(index: 2019=100, monthly data)
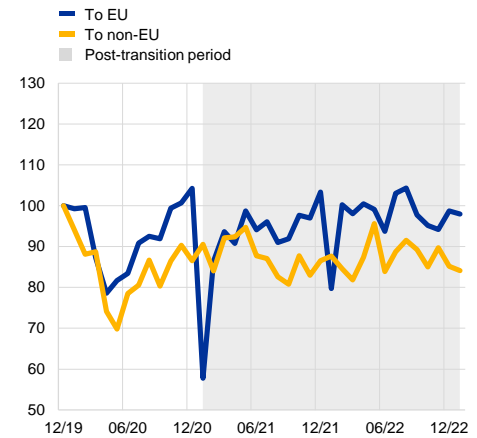
c) Share of imports from the EU in total UK imports

(percentages, three-month moving averages)
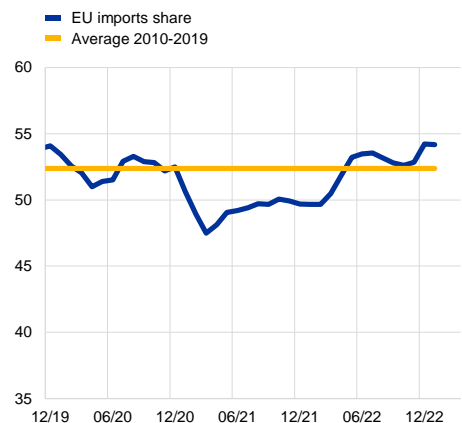
d) Share of exports to the EU in total UK exports

(percentages, three-month moving averages)
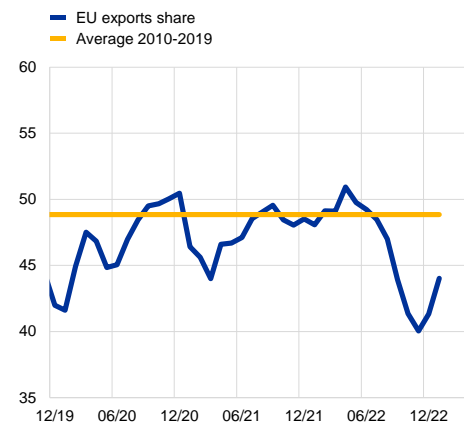
Source: ONS.
Notes: The post-transition period started in January 2021, when the TCA entered into force provisionally. The latest observations are for January 2023.

5   See "The Trade and Cooperation Agreement: Two Years On – Proposals for Reform by UK Business", British Chambers of Commerce, 2022.

Services trade with the EU has remained somewhat weaker than trade with non-EU partners. Most of the initially stronger decline in services trade with the EU appeared to be pandemic-related, particularly given the higher share of the travel and transportation sectors in EU trade than in non-EU trade and the travel restrictions during the pandemic (Chart 2). Together with the recovery in tourism, UK services trade has bounced back, well exceeding pre-pandemic levels. This also reflects the post-pandemic increase in travel prices. Other important categories of services exports to the EU, such as financial services, fell further than, or failed to grow as much as, exports to the rest of the world until the end of 2021 and have remained below their pre-pandemic levels. Brexit thus appears to have played some role, possibly also owing to the lack of agreements covering trade in services. In the area of financial services, which account for around 20% of total UK services exports, the TCA's provisions were limited. The United Kingdom and EU had agreed that, alongside the TCA, they would conclude a Memorandum of Understanding on regulatory cooperation, but this has still not been signed. Since Brexit, the importance of the EU as a UK trading partner has declined, with the EU accounting for 29% of total UK financial services exports in 2022, compared with 37% in 2019.

Chart 2

UK trade in services and UK services exports for selected sectors

a) Total services export and import volumes

(index: 2019=100, monthly data)

- Imports
- Exports
- Post-transition period
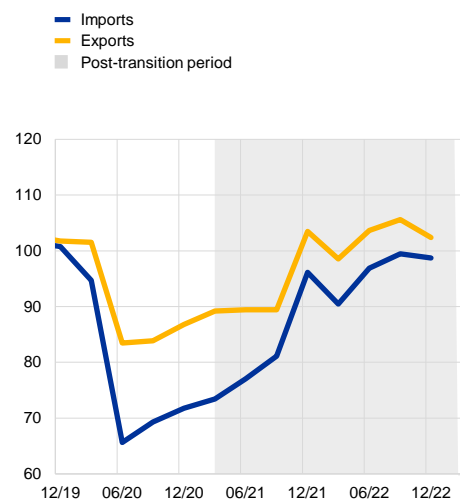
b) Services exports (values) for selected sectors

(index: Q4 2019=100, quarterly data)

- Transport
- Travel
- Personal, cultural, recreational
- Financial services
- Post-transition period
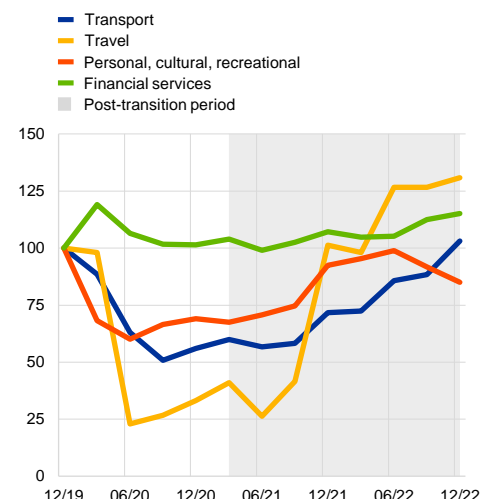
c) Share of UK services imports from the EU in total UK services imports

(percentages, three-month moving averages)

- EU imports share
- Average 2010-2019
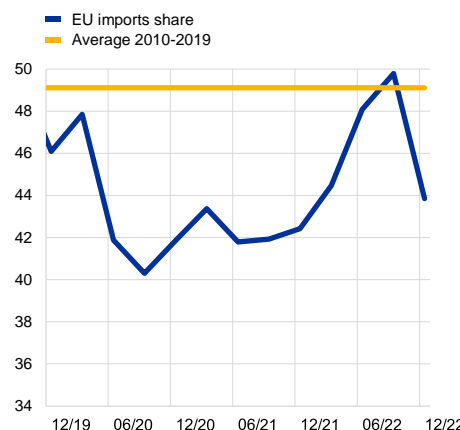
d) Share of UK services exports to the EU in total UK services exports

(percentages, three-month moving averages)

- EU exports share
- Average 2010-2019
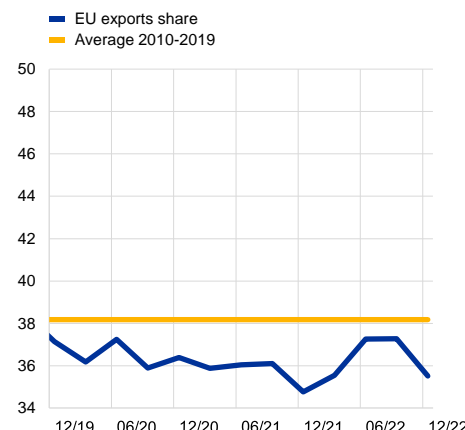
Source: ONS.
Notes: The decomposition of services trade into exports to the EU and non-EU partners and imports from the EU and non-EU partners is only available in terms of values. The latest observations are for January 2023 for volumes and the fourth quarter of 2022 for services export values.

The UK current account deficit has widened since the implementation of the TCA, mostly driven by developments in the goods balance. In the first quarter of 2022, the UK current account deficit reached a record high of 7.7% of GDP, which was due to a worsening in both the trade deficit and the income balance (Chart 3). While most of the recent widening of the trade deficit could be attributed to high energy prices, the deterioration of the goods balance since the implementation of the TCA has generally been the main driver behind the developments in the UK current account. The services balance has remained fairly stable since the beginning of

2021, at around 6% of UK GDP, marking an end to the previously observed trend of rising surpluses in the UK services balance.

Chart 3

UK current account

a) Decomposition of the UK current account

(percentages of GDP)

- Trade
- Primary income
- Secondary income
- Current account balance
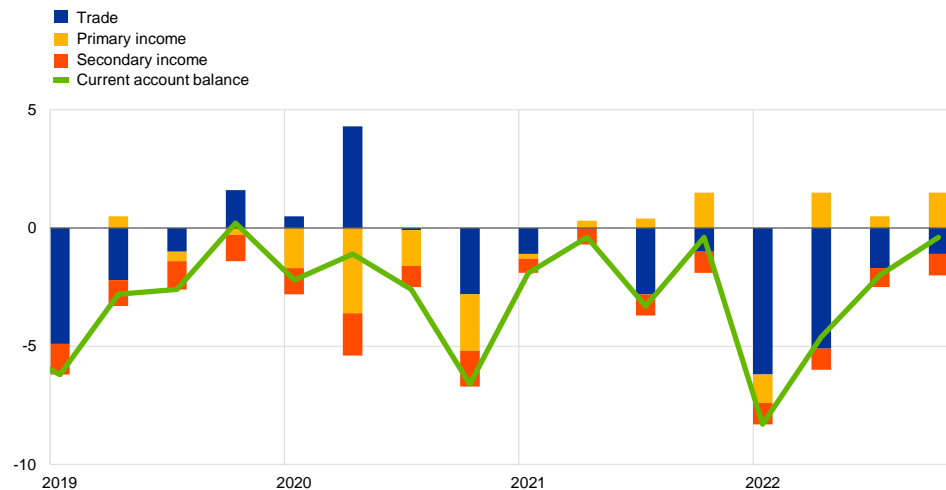
b) Goods and services balances

(percentages of GDP)

- Goods
- Services
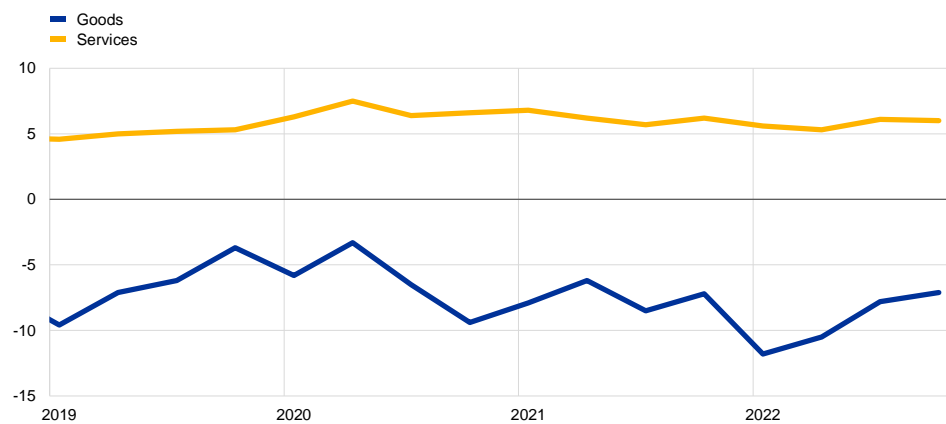
Source: ONS.
Note: The latest observations are for the fourth quarter of 2022.

The post-pandemic recovery in UK trade has lagged behind that of other advanced economies. While the United Kingdom saw a collapse in exports that was similar to other countries at the start of the pandemic, it benefited much less from the subsequent recovery in global trade (Chart 4). By the end of 2021, other advanced economies' exports had rebounded almost to their pre-pandemic levels, while UK exports remained around 10% below that level. As a result, UK trade as a share of GDP fell by 11% between 2019 and the end of 2021 – a significantly stronger decline than that observed in the euro area or the United States. By the end of 2022, the gap between UK exports and those of other advanced countries appeared to have closed, which may indicate that the disturbances linked to the Brexit transition period are dissipating. However, this needs to be interpreted with

caution. Temporary catch-up effects from the pandemic and recent changes in UK trade statistics may also account for this development.

Chart 4

Goods export volumes in advanced economies

(index: 2019=100, monthly data)
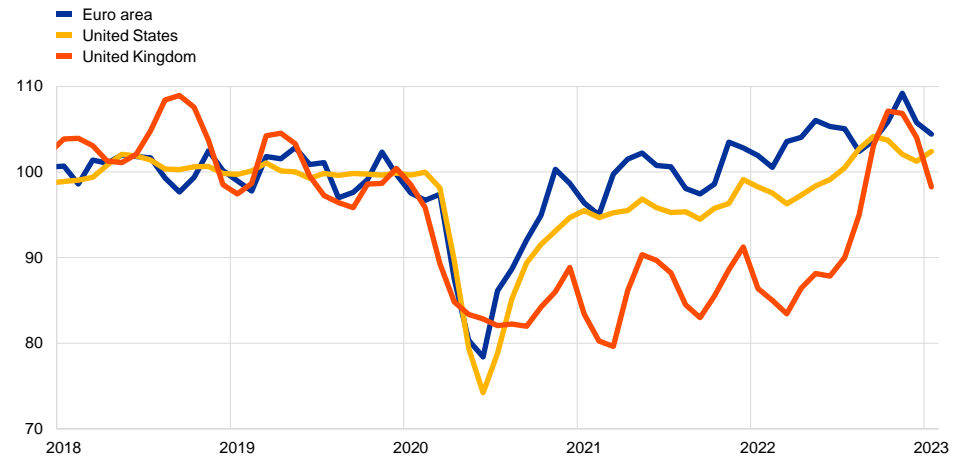
Source: CPB Netherlands Bureau for Economic Policy Analysis.
Note: The latest observations are for January 2023.

3 Weakness in UK trade compared to other advanced economies: the role of Brexit

Two main approaches have been taken in the literature to isolate the impact of Brexit from pandemic-related effects. Various researchers have used a difference-in-difference approach, using different datasets and specifications. For example, Freeman et al., Du and Shepotylo, and Du et al. compare the evolution of UK-EU trade with UK trade with the rest of the world. Kren and Lawless, by contrast, use EU trade with the rest of the world as a comparison group.[6] Using high-frequency product-level data on trade in goods, a comprehensive set of product-time and product-partner fixed effects are applied to control for changes in trade patterns other than Brexit, in particular the changes in trade flows as a result of the COVID-19 pandemic. Following an alternative approach, Springford provided several updates of estimates of Brexit impacts using a "doppelgänger" method in which an algorithm selects countries whose economic performance closely matched that of the United Kingdom before Brexit.[7]

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[6] See Freeman, R., Manova, K., Prayer, T. and Sampson, T., "UK trade in the wake of Brexit", *Discussion Paper*, No 1847, Centre for Economic Performance, April 2022; Du. J. and Shepotylo, O., "TCA, Non-tariff Measures and UK Trade", *ERC Research Paper*, No 98, Enterprise Research Centre, June 2022; Du, J., Satoglu, E.B. and Shepotylo, O., "Post-Brexit UK Trade: An Update", *Insight Paper*, Centre for Business Prosperity, Aston University, November 2022; and Kren, J. and Lawless, M., "How has Brexit changed EU-UK trade flows?", *ESRI Working Paper*, No 735, Economic and Social Research Institute, October 2022.

[7] See Springford, J., "The cost of Brexit to June 2022", *Insight*, Centre for European Reform, December 2022. For more details on the methodology, see Springford, J., "What can we know about the cost of Brexit so far?", Centre for European Reform, June 2022.

Taking into account the differences in methodologies, the available empirical evidence suggests that Brexit has reduced UK-EU trade in both directions.
Table 1 provides an overview of recent results obtained using various approaches. Estimates of the decline in UK trade with the EU range from around 10% to 25%.[8] As the updates by Springford and Du et al. show, the results also depend on the time horizon being considered. As both UK and EU firms are still adjusting to the new environment, the gap between estimates may narrow again over time. Apart from providing estimates of Brexit effects since 2021, the available studies generally find no evidence of anticipation effects, i.e. a decline in UK-EU trade as a proportion of total UK trade prior to the provisional implementation of the TCA at the start of 2021. Across EU Member States, Brexit has led to a significant decline in trade with the United Kingdom in almost all cases, although at varying magnitudes. The decline has been most noticeable for those countries that historically accounted for a higher share of trade (i.e. trade in both directions with Ireland, exports to Cyprus and Malta, imports from Belgium and the Netherlands).[9] At the product level, it appears that there has been a substantial reduction in the number of products exported from the United Kingdom to the EU. The same is not found for exports of products from the EU to the United Kingdom. Overall, this is broadly consistent with the increased customs requirements on the EU side having a greater impact on low-value trade flows, often stopping such flows completely. At the same time, there has been an increasing concentration of export sales among fewer, larger exporters.

Table 1

A selection of recent (i.e. post-Brexit) estimates of Brexit impacts on EU-UK goods trade

Authors	Method	Brexit impacts
Kren and Lawless	Difference-in-difference approach; product-level data; control group: EU trade with the rest of the world	UK exports to the EU declined by 16%; UK imports from the EU declined by 20%
Freeman et al.	Difference-in-difference approach; product-level data; control group: UK trade with the rest of the world	Persistent 25% fall in relative UK imports from the EU, but only temporary decline in relative UK exports to the EU
Du and Shepotylo	Difference-in-difference approach; product-level data; control group: UK trade with the rest of the world; covering period up to Q3 2021	22% fall in relative UK exports to the EU compared with the rest of the world; 26% decline in relative UK imports
Du et al.	Difference-in-difference approach; product-level data; control group: UK trade with the rest of the world; update of the analysis by Du and Shepotylo up to Q1 2022	22.9% fall in relative exports to the EU compared with the rest of the world; negative impact on UK imports subsiding
Springford	"Doppelgänger" method	Up to June 2022: total trade (exports + imports) 7% lower than if the United Kingdom had not left the EU. Up to Q4 2021: total trade 13.6% lower than if the United Kingdom had not left the EU

Source: Authors' compilation.

A comparison of these results with those from analyses performed prior to Brexit suggests that the initial impacts following the TCA have been more severe than expected. Ahead of Brexit, many Brexit scenario simulations were performed with different types of models, assuming different levels of tariffs and non-

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[8] Results from a preliminary internal analysis performed in the context of the EU-UK network using aggregate data also lie within this range.

[9] See Kren and Lawless, op. cit., Table 4.

tariff barriers.[10] For instance, based on a New Keynesian DSGE model, which assumes a free trade agreement scenario for goods trade with the euro area similar to the terms of the TCA, it was typically expected that Brexit would lead to a decrease in total UK exports and imports (in the long run) of roughly 3%, with minor effects on goods exports to the euro area but more sizeable declines in services exports to the euro area.[11] The available evidence so far suggests that the initial adverse impact on UK goods exports has been more sizeable, indicating that UK exporters, at least initially, have been struggling to meet the increased administrative requirements following the introduction of customs checks at the EU border. As developments in services appear to have been strongly driven by pandemic-related factors, further analyses would be needed to disentangle the impact of Brexit from the impact of the pandemic on this sector.[12]

4   Recent developments in the UK labour market

The UK labour market has become increasingly tight since the post-pandemic reopening, which also coincided with a fall in the number of EU migrants working in the United Kingdom. Following the post-pandemic recovery in demand in the second quarter of 2021, UK employers faced an unusually tight labour market, with a historically high number of vacancies and a low unemployment rate. Labour market tightness, measured as vacancies per unemployed person, has shown limited signs of easing, while companies have continued to struggle with recruitment difficulties (Chart 5, panel a).

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[10]   For a summary of results of earlier analyses, see "A review of economic analyses on the potential impact of Brexit", *Occasional Paper Series*, No 249, ECB, October 2020. Pre-Brexit studies were typically concerned with longer-run steady-state effects and most envisaged some stronger disruptions in advance of the referendum.

[11]   See Pisani, M. and Vergara Caffarelli, F., "What will Brexit mean for the British and euro-area economies? A model-based assessment of trade regimes", *Temi di Discussione (Working Papers)*, No 1163, Banca d'Italia, January 2018.

[12]   There has been no recent analysis of Brexit impacts on services trade. Du and Shepotylo studied the impacts of the 2016 Brexit referendum on services trade in the United Kingdom and Ireland for the period up to the second quarter of 2020, finding that Brexit was already having adverse impacts on UK services trade ahead of the end of the transition period. See Du, J. and Shepotylo, O., "Feeding the Celtic Tiger – Brexit, Ireland and Services Trade", *Research Paper*, Aston Business School, May 2021.

Chart 5

Recent UK labour market developments

a) Labour market tightness and unemployment

(left-hand scale: percentages; right-hand scale: ratio of vacancies to unemployment, monthly data)

- Unemployment rate (left-hand scale)
- Labour market tightness (right-hand scale)
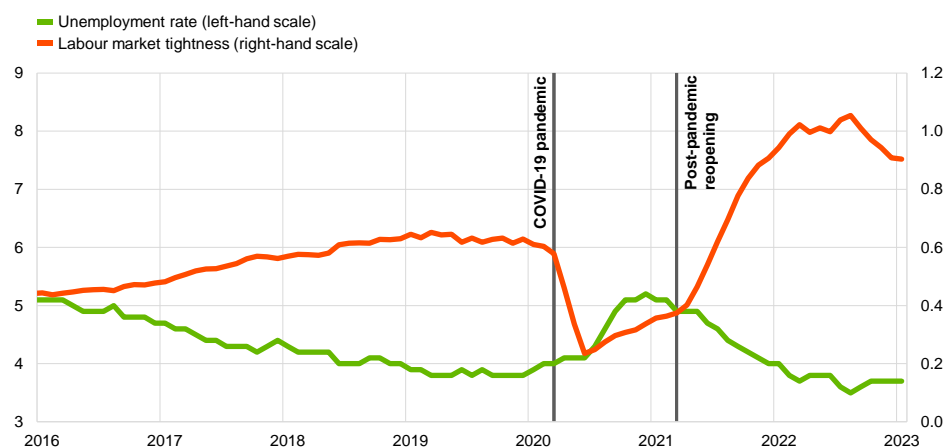
b) Labour demand and supply

(index: February 2020=100, monthly data)

- Labour supply: active population
- Labour demand: filled and open jobs
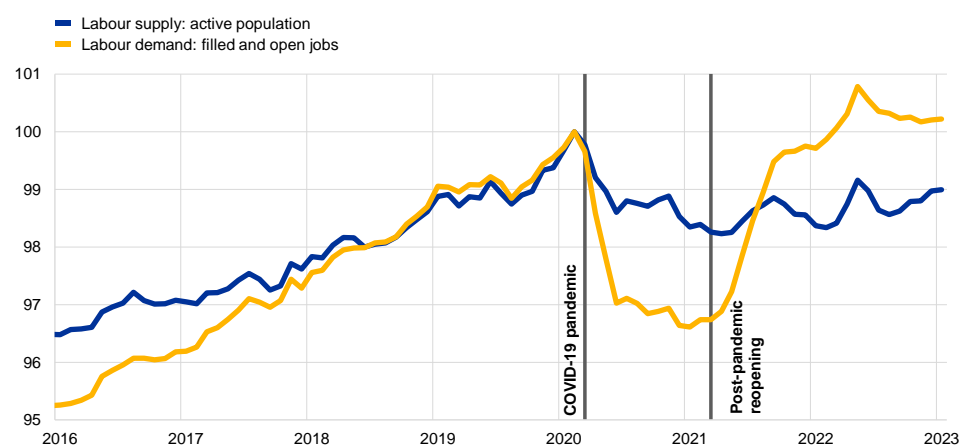
Source: ONS.
Notes: All series are shown as three-month moving averages. Labour market tightness is measured as vacancies per unemployed person. Data refer to UK population above 16 years old. The latest observations are for January 2023.

Weakness in labour supply has been the main driver of UK labour market tightness, while the surge in post-pandemic aggregate demand has played only a limited role. Many other advanced economies also experienced tight post-pandemic labour markets. In the same way as the initial collapse in aggregate demand at the start of the pandemic reduced recruitment of new workers, the reopening of the economy accelerated demand and encouraged companies to rehire staff. However, the persistence and the extent of labour market tightness make the United Kingdom an outlier, comparable only to the US economy.[13] One reason could be the sluggish recovery in UK labour supply, which has lagged behind other advanced economies (Chart 6). During the pandemic, many people became inactive, and, unlike the employment rate, the participation rate in the workforce has not reached pre-pandemic levels as the economy has recovered (Chart 5, panel b). A

[13] See also Gomez-Salvador, R. and Soudan, M., "The US labour market after the COVID-19 recession", *Occasional Paper Series*, No 298, ECB, July 2022.

historical shock decomposition using a Bayesian vector autoregression (BVAR) analysis illustrates that the surge in UK post-pandemic labour market tightness can be attributed mainly to a smaller pool of available workers. While a faster than expected recovery was responsible for the initial rise in demand after the reopening of the economy, the analysis suggests that labour supply played a particularly important role. In contrast, aggregate supply constraints and labour mismatches appear to have been less significant (Chart 7).[14] The tightness of the UK labour market has therefore raised questions about the role of Brexit in UK labour shortages. The next section outlines the potential role of Brexit and changes in immigration policy in explaining these developments in labour supply.

Chart 6

Labour supply in advanced economies

(index: Q1 2020=100, quarterly data)
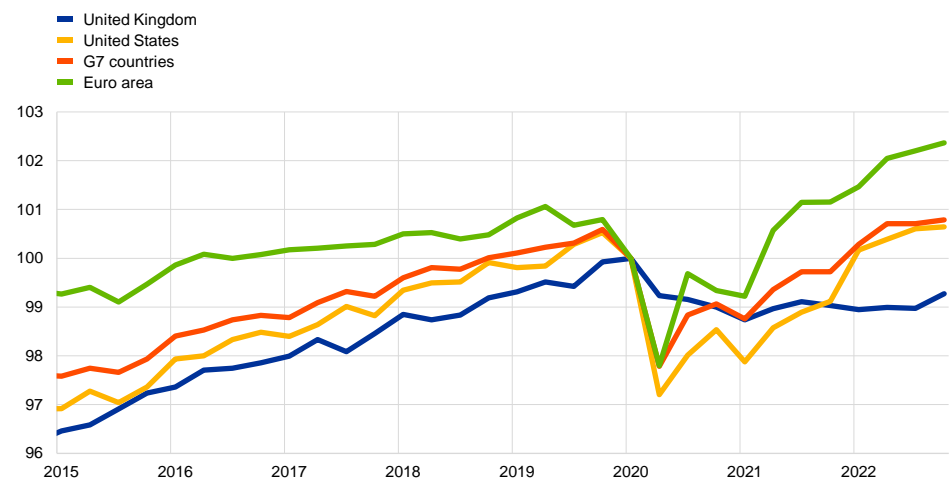
Sources: Organisation for Economic Co-operation and Development.
Notes: Data for all countries refer to the active population between 15 and 64 years old that is either employed or actively seeking work. The latest observations are for the fourth quarter of 2022.

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14 We introduce a BVAR model for the UK labour market that features structural identification via sign restrictions. The model includes four variables: output, inflation, labour market tightness and wages. With this set of variables, we aim to identify four shocks: an aggregate demand shock, an aggregate supply shock, a labour supply shock and a mismatch shock. A positive demand shock represents an upward shift in the demand curve, which pushes up output and inflation. A positive aggregate supply shock reflects changes in productivity or potential capacity in the economy, increasing output and reducing inflation through lower marginal costs for firms. A positive labour supply shock refers to an exogenous increase in labour supply which increases the number of participants in the labour market, leading to an increase in the number of job seekers. This makes it easier for firms to fill vacancies, leading to a decrease in labour market tightness and wages and an increase in output. A positive mismatch shock refers to exogenous changes in the process of matching jobs and workers, shifting the job creation curve upward and increasing both labour market tightness and wages in the economy.

Chart 7

Labour market tightness, BVAR historical decomposition

(percentage deviation from the mean and percentage point contributions, monthly data)

- Aggregate demand
- Aggregate supply
- Labour supply
- Mismatch
- Labour market tightness
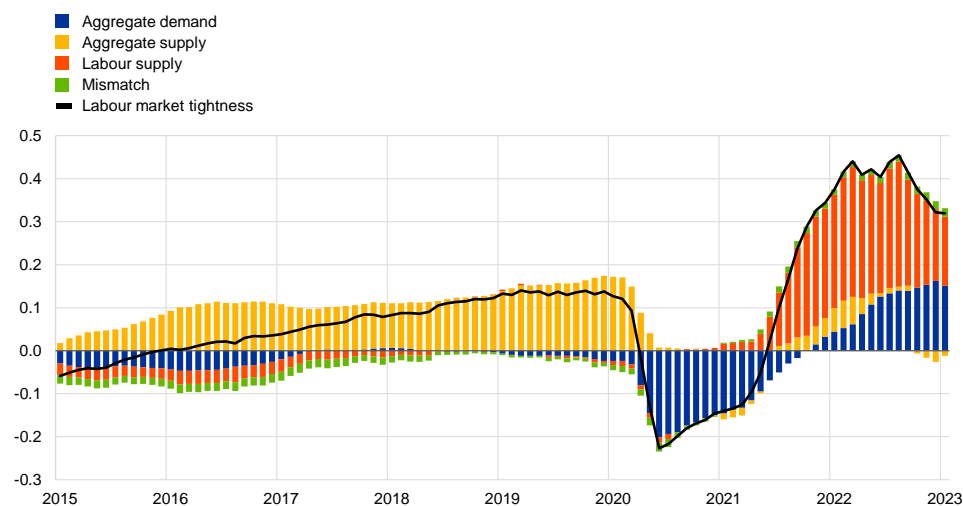
Sources: ONS and ECB staff calculations.
Notes: The chart shows the median posterior distribution of the historical decomposition of labour market tightness in deviation from its initial condition. Based on a BVAR estimation with sign restrictions, estimated using a monthly sample between January 2002 and January 2023. Structural shocks are identified using sign restrictions. In particular, aggregate demand shocks are identified by assuming that GDP and the consumer price index (CPI) move in the same direction, while aggregate supply shocks assume that they move in opposite directions. Labour supply shocks are assumed not to affect aggregate variables (GDP and CPI) on impact and to move tightness and wages in the same direction. Mismatch shocks affect wages and labour market tightness. Labour market tightness is measured in levels, while other variables are measured in month-on-month growth rates. The latest observations are for January 2023.

5 Weakness in UK labour supply: the role of Brexit

The Brexit referendum and the pandemic prompted a slowdown in EU employment growth as many EU workers found it less attractive to work in the United Kingdom. Prior to the 2016 referendum, successive EU enlargements had accelerated the movement of people between the United Kingdom and the rest of the EU.[15] The prospect of the Brexit referendum in June 2016 prompted a decline in EU net migration, as EU citizens found it less attractive to work in the United Kingdom.[16] The decline in new arrivals was accelerated by the onset of the pandemic in early 2020 and by the implementation of the TCA in January 2021.[17] The agreement introduced changes to UK immigration policy and ended automatic free movement for EU nationals not already settled in the United Kingdom. When looking at changes in the employment of EU citizens in the United Kingdom, it is

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[15] The rapid increase in the movement of people can be attributed to several factors, such as the United Kingdom's decision to immediately welcome nationals from the new Member States in 2004, the flexibility of the UK labour market, the appeal of London and the English language, and the attractiveness of UK universities. See Sumption, M., Forde, C., Alberti, G. and Walsh, P.W., "How is the End of Free Movement Affecting the Low-wage Labour Force in the UK?", *Report*, The Migration Observatory at the University of Oxford and ReWAGE, August 2022.

[16] The discouragement of EU workers can mainly be explained by the political and legal uncertainty related to Brexit, but also by the declining value of the pound sterling and the relatively better economic performance of other EU economies.

[17] The pandemic-related exit of EU citizens partially reflected their high share of employment in high-contact services sectors, which were prone to furloughs and layoffs. In addition, the United Kingdom performed comparatively badly in terms of health sector capacities during the first wave of the pandemic.

evident that growth in such employment has slowed considerably since the Brexit referendum. A sharp fall at the onset of the pandemic was followed by a slow recovery in EU employment levels (Chart 8).

Chart 8

EU employment before and after the Brexit referendum

(index: Q2 2016=100, quarterly data)
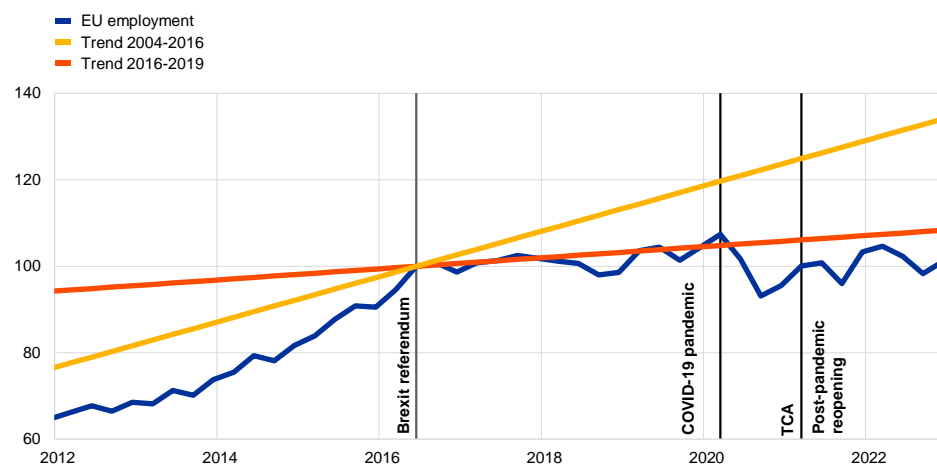
Source: ONS.
Notes: The chart shows employment of EU citizens in the United Kingdom before and after the Brexit referendum. The series is not seasonally adjusted. Data are shown on a quarterly basis and must be interpreted with some caution as they are based on Labour Force Survey responses weighted according to demographic trends from 2018 that pre-date the COVID-19 pandemic. "Trend 2004-2016" refers to the period between the first quarter of 2004 and the second quarter of 2016. "Trend 2016-2019" refers to the period between the third quarter of 2016 and the first quarter of 2020. The latest observation is for the fourth quarter of 2022.

The rise in UK vacancies and labour market tightness has been greatest in sectors that relied most heavily on EU workers, but this can also be attributed to a sharp recovery in demand in the sectors most affected by the pandemic.
In the second half of 2021 there were many reports of UK labour shortages, ranging from lorry drivers to healthcare and hospitality workers.[18] At first glance, the sharp rises in vacancies appeared to be limited predominately to the occupations and sectors that relied most heavily on EU workers before the pandemic, as increased demand for labour potentially reflected the reduced supply of workers from the EU. These sectors also experienced a sharper increase in labour market tightness (Chart 9, panels a and b). This might imply a decline in matching efficiency in these industries, owing to an increase in skill and sectoral mismatches between those seeking work and available jobs.[19] The implications of Brexit were underlined by survey data, as, on average, 15% of UK companies cited lack of availability of EU workers as one of the reasons for their recruitment difficulties. This was particularly evident for sectors which had a high share of EU workers before the pandemic, such

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[18] For instance, severe shortages of lorry drivers affected the supply of retail goods, food products and fuel at petrol stations and restricted the capacity of UK ports. Shortages of butchers and workers in the meat processing industry forced farms to cull thousands of animals. In addition, there have been instances of severe recruitment difficulties in hospitality, construction, agriculture, and business and professional services.

[19] See also "Monetary Policy Report", Bank of England, February 2023.

as accommodation and food services (Chart 10).[20] However, these sectors were also the ones most affected by the pandemic, since EU nationals were overrepresented in contact-intensive industries, which experienced the largest fall in employment during the lockdowns (Chart 9, panel c). Along with Brexit, the rapid recovery in post-pandemic consumer demand can therefore also explain a rapid surge in vacancies and labour market tightness, as firms in these sectors struggled to rehire previously laid-off staff.[21]

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[20] Other sectors with above-average values were: manufacturing; transport and storage; water supply, sewerage, waste management and remediation activities; real estate activities; and education. For results from the Business Insights and Conditions Survey, see "Business insight and impact on the UK economy: 9 February 2023", *statistical bulletin*, ONS, February 2023.

[21] Changes in employment do not reflect the 11.7 million jobs furloughed under the Coronavirus Job Retention Scheme, which applied from 1 March 2020 to 30 September 2021.

Chart 9

Labour market developments in sectors with traditionally high shares of EU workers

a) Vacancies

(index: December 2019=100, monthly data)

Sectors with a high share of EU workers in 2015
Other sectors
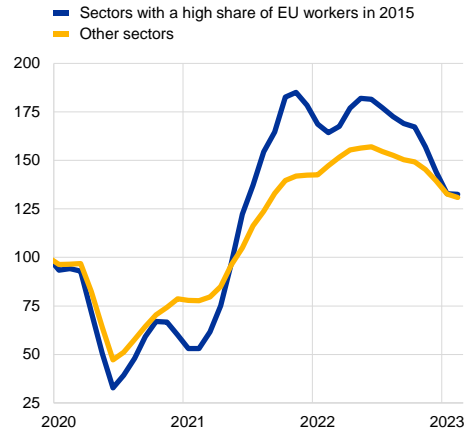
b) Labour market tightness

(index: December 2019=100, monthly data)
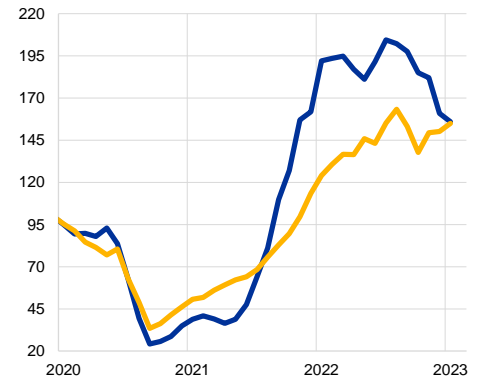
c) Employment

(index: Q4 2019=100, quarterly data)
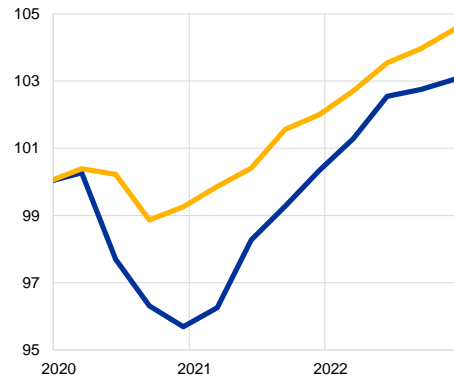
Source: ONS.
Notes: The sectors that had the largest share of EU employees in 2015 were accommodation and food service activities (12.8%); manufacturing (10%); administrative and support service activities (9.8%); and transportation and storage (8.5%). "Other sectors" includes water supply, sewerage, waste management and remediation activities; construction; wholesale and retail trade, repair of vehicles; information and communication; financial and insurance activities; real estate activities; professional, scientific and technical activities; public administration and defence; education; human health and social work activities; and arts, entertainment and recreation. Some sectors are excluded owing to insufficient sample representation. Data for vacancies and tightness are shown as three-month moving averages. Data for unemployment are shown at quarterly frequency. The monthly series are not seasonally adjusted. The latest observations are for February 2023 for vacancies, January 2023 for labour market tightness and the fourth quarter of 2022 for employment.

Chart 10

Recruitment difficulties owing to reductions in EU applicants

(percentages of companies)

- ● All businesses
- ● Accommodation and food service activities
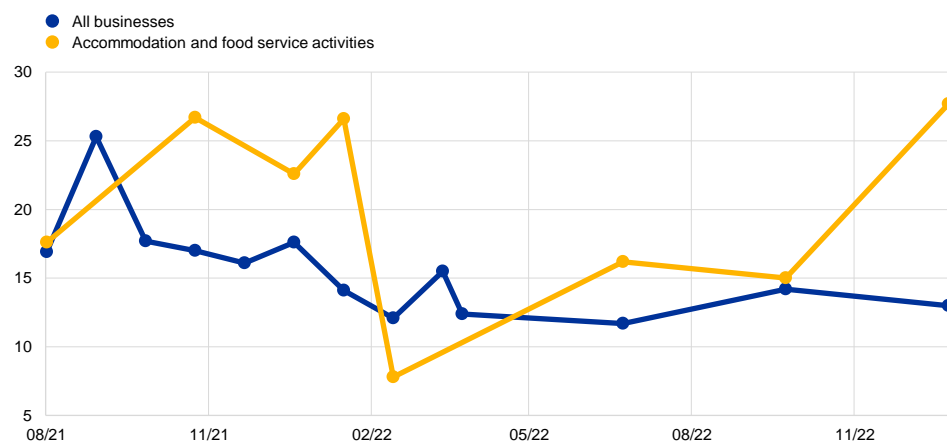
Source: Business Insights and Conditions Survey (ONS).
Notes: The chart shows responses to the survey, which was performed at irregular intervals, in particular for sector-level data. The series display the share of businesses that reported difficulties recruiting employees and considered a reduced number of EU applicants to be one of the major factors. The latest observations are for 31 December 2022.

The slowdown in EU migration has to some extent been offset by an increase in non-EU migration. International migration was a key element in employment growth in most UK sectors before 2019.[22] Higher-skilled sectors recruited from both EU and non-EU countries, while lower-skilled sectors typically relied heavily on EU workers, given that lower-skilled workers from non-EU countries were generally not allowed to enter the UK labour market.[23] Following the Brexit referendum, the size of the EU migrant labour force began to shrink, while the share of non-EU employees was gradually increasing. The changes in total net migration indicate that by end of 2021, migration flows had returned to, or even surpassed, pre-pandemic levels. However, when only migrants seeking work are considered, the flows are much lower, albeit still relevant for labour market dynamics (Chart 11).[24] This raises the question of whether employers started to switch from EU to non-EU workers or whether the aggregate dynamics conceal asymmetries recorded at a sectoral level.

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[22] Workers from outside the United Kingdom accounted for 70% of the increase in employment between 2004 and 2019. The contribution from EU employment was slightly above 35%.

[23] Some exceptions for employer-sponsored long-term visas were allowed for shortage occupations and for young people under the age of 26, while unsponsored long-term visas were available for "Global Talent", entrepreneurs and Commonwealth citizens. Some non-EU workers were also eligible for temporary work visas. See Sumption, M. and Strain-Fajth, Z., "Work visas and migrant workers in the UK", *Briefing*, The Migration Observatory at the University of Oxford, September 2022.

[24] While net migration was positive in 2022, the sharp increase in non-EU inflows also reflects other factors, such as people arriving for humanitarian protection (from Ukraine and Hong Kong) and a post-pandemic surge in international students.

Chart 11

Net migration to the United Kingdom by nationality

a) Old data collection methodology

(thousands, annual data)

- Total net migration
- UK net migration
- EU net migration for work purposes
- Non-EU net migration for work purposes
- Non-EU net migration for other reasons
- EU net migration for other reasons
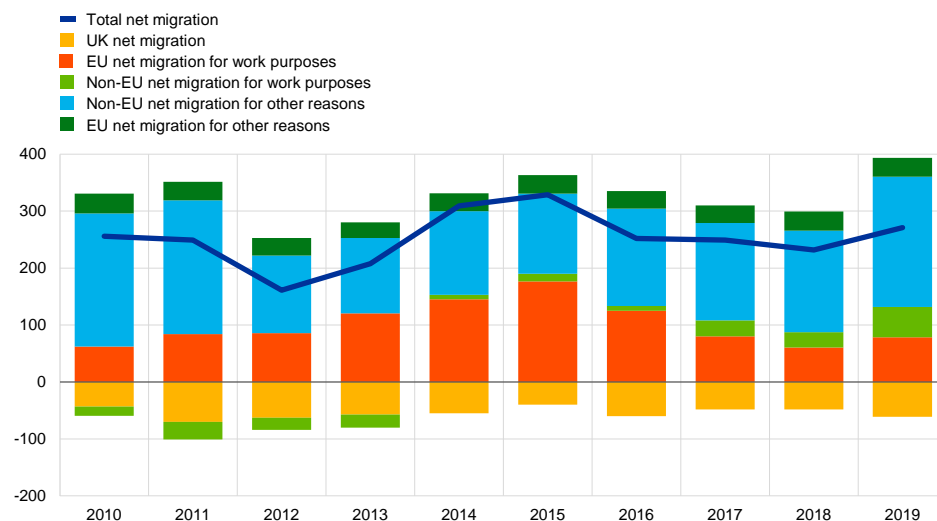
b) New data collection methodology

(thousands, quarterly data)

- Total net migration
- UK net migration
- EU net migration
- Non-EU net migration for work purposes
- Non-EU net migration for other reasons
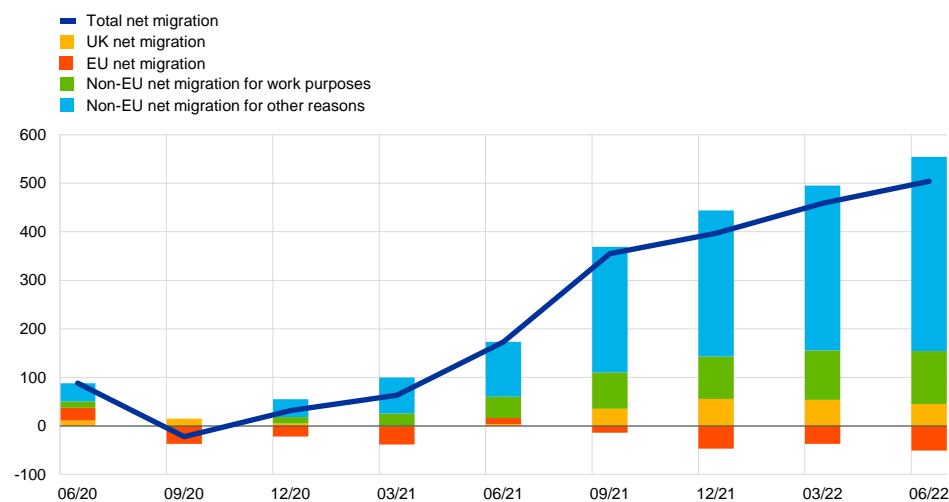
Source: Centre for International Migration (ONS).
Notes: Panel a) displays annual data, while panel b) shows quarterly values since the second quarter of 2020. Each data point refers to year-end values in a particular quarter. Data on non-EU migration for work purposes in panel b) are approximated by ECB staff on the basis of the share of migration for work purposes in International Passenger Survey data. Such data are not available for EU migration under the new data collection methodology. In 2020 and 2021, study (45%) was the main reason for non-EU migration, while work (26%) and other reasons (29%) each accounted for a similar share. The latest available data show that other reasons accounted for a larger share (39%), probably reflecting an increased inflow of people arriving for humanitarian protection. The old estimates are produced using different methods from the new estimates, implying that comparisons between the two panels should be avoided. It should also be noted that the new estimates are experimental and provisional. These estimates are based on administrative and survey data from different sources, supported by statistical modelling where the data are incomplete. The latest observations are for the second quarter of 2022.

While on average the rise in non-EU arrivals has more than offset the fall in EU migration, the new migration policy has reduced labour supply in some sectors. The new migration rules had a particularly negative impact on labour supply in lower-skilled sectors. The reversal in migration flows could be explained by the new immigration system that liberalised access to the UK labour market for skilled non-EU citizens, while requiring visas for EU nationals who had previously faced no

restrictions. Work permits have become attainable only for those above a certain skill and salary level.[25] This made most lower-skilled industries, which had previously relied predominantly on EU workers, ineligible to issue work visas, and prompted an increase in non-EU migration, easing shortages in some sectors and occupations (Chart 12, panel a). Sectors driving the surge in employment of non-EU citizens were, in most cases, not the same as those driving the decline in employment of EU citizens. As new visa conditions made hiring of lower-skilled EU workers more difficult, the absence of these workers became particularly apparent in sectors such as accommodation and food services (Chart 10). Firms in the hospitality industry were thus initially not able to replace workers from the EU, although the industry has observed an increase in non-EU employment over the past year (Chart 12, panel b).[26] In contrast, some other industries, such as health and social work, have not been negatively affected by the new migration rules or have even benefited from the inflow of skilled non-EU workers (Chart 12, panel c).[27] While on average the rise in non-EU employment has offset the fall in EU employment, the new migration policy has reduced labour supply in some sectors.[28] Nevertheless, the evidence available so far suggests that changes in migration flows are only one of multiple factors contributing to an increase in labour market tightness.

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[25] The new migration system introduced in January 2021 allows prospective economic migrants to apply for either a "Skilled Worker visa", if they already have a job offer above a certain salary and skill threshold, or a "Seasonal Worker visa", which is intended for short assignments in the agricultural and food-production sectors. The loss of free movement has therefore been offset by the more liberal regime for skilled work visas, primarily benefiting non-EU workers.

[26] Initially, the biggest declines in EU employment were in accommodation and food services and in administrative and support services. In both sectors, employers relied heavily on EU citizens before Brexit and have not resorted to the work visa system since the pandemic, because relatively few of the jobs concerned meet the skill and salary criteria for work visas and because these employers have little experience of using the visa system in the past. See Sumption, M., Forde, C., Alberti, G. and Walsh, P.W., "How is the End of Free Movement Affecting the Low-wage Labour Force in the UK?", op. cit. In 2022 these sectors recorded an increase in non-EU employment, which could be attributed to inflows of non-EU workers through the Youth Mobility Scheme, humanitarian protection visas or as dependants to the main applicants. Their flexible work rights made them likely to seek employment in low-skilled occupations. See "Migration Advisory Committee (MAC) annual report, 2022", *corporate report*, Migration Advisory Committee, January 2023.

[27] The increase in non-EU workers was driven primarily by the health sector, as the high share of roles eligible for skilled work visas helped with a switch from lower levels of EU migration towards non-EU recruitment. Health sector employers are also larger on average and have more experience of using visa schemes.

[28] Analysis comparing pre-pandemic counterfactuals to the actual outturns points to a net loss of workers accounting for 1% of the labour force. See Portes, J. and Springford, J., "The Impact of the Post-Brexit Migration System on the UK Labour Market", *Discussion Paper Series*, No 15883, IZA Institute of Labor Economics, January 2023.

Chart 12

UK employment by nationality

(change since December 2019, thousands, monthly data)

- ■ Change in non-UK employment
- ■ Change in EU employment
- ■ Change in non-EU employment

a) All sectors

b) Accommodation and food services

c) Health and social work
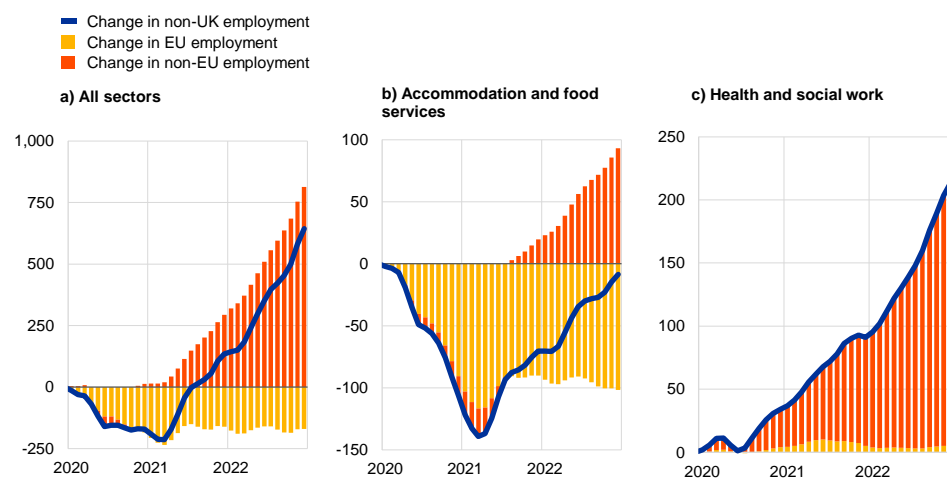
Source: HM Revenue and Customs.
Notes: The data are not seasonally adjusted and are shown as three-month moving averages. They include only payroll employment under the Pay As You Earn system and do not include other sources of employment, such as self-employment. However, the data do include individuals who were furloughed as part of the Coronavirus Job Retention Scheme. It should also be noted that these estimates are experimental and provisional. Changes in net UK employment are excluded to highlight the changes in employment of non-UK citizens. The accommodation and food sector represents 8% of total UK employment, while the health and social work sector accounts for 14%. The latest observations are for December 2022.

Brexit can only partially explain the weakness in the UK labour supply recovery, while an ageing population and pandemic effects appear to play an important role in explaining the decline in UK labour force participation.

Changes in EU migration are not the only factor behind the recent changes in UK labour supply. Labour force growth had already started to decrease before the pandemic, as the United Kingdom's "baby boomer" generation began to retire (as also observed in many other advanced economies), resulting in a marked shrinkage in the UK-born working-age population. Population ageing was countered to a certain extent by raising both male and female pension ages and through higher educational attainment, but the impact of these measures had largely dissipated by the onset of the pandemic.[29] Higher inactivity rates among those aged over 50 has contributed considerably to the increase in the inactive population (Chart 13, panel a). Other factors triggered by the pandemic have also contributed to the decline in labour participation. While the pandemic and prolonged waiting times for health services appear to have increased the number of people with long-term health issues among the inactive population, this increase is thought to be predominantly linked to individuals who were already inactive before the pandemic. When looking at flows out of the labour force, early retirement accounts for a much larger share (Chart 13, panel b).[30]

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[29]   See Saunders, M., "Some reflections on Monetary Policy past, present and future", speech at the Resolution Foundation, 18 July 2022.

[30]   See Boileau, B. and Cribb, J., "The rise in economic inactivity among people in their 50s and 60s", *IFS Briefing Note*, No BN345, Institute for Fiscal Studies, June 2022.

Chart 13

Other factors driving an increase in labour market inactivity

a) Inactive population by age cohort

(change since February 2020, thousands, monthly data)

- Aged 16-49
- Aged 50-64
- Aged 65+
- Total
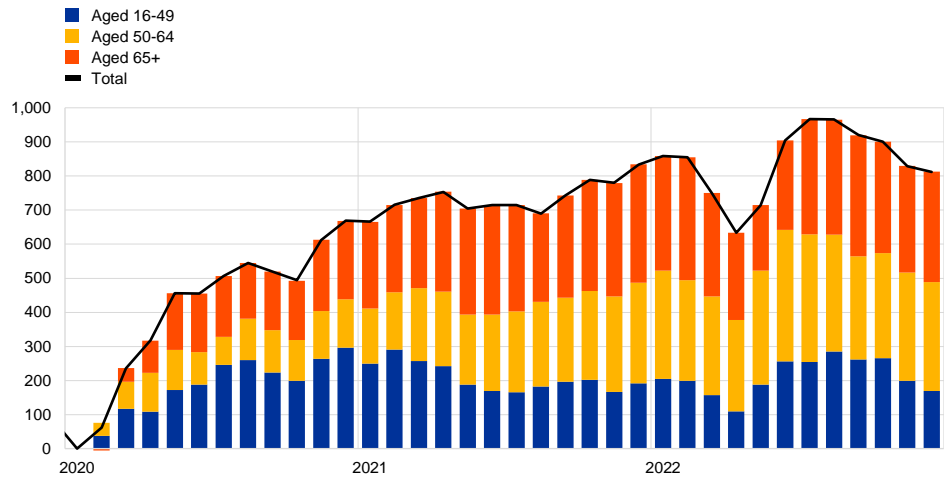
b) Reasons for flows into inactivity for people aged between 50 and 70 years

(change compared to average for 2016-2019, thousands, annual data)

- Retirement
- Sickness
- Other reasons
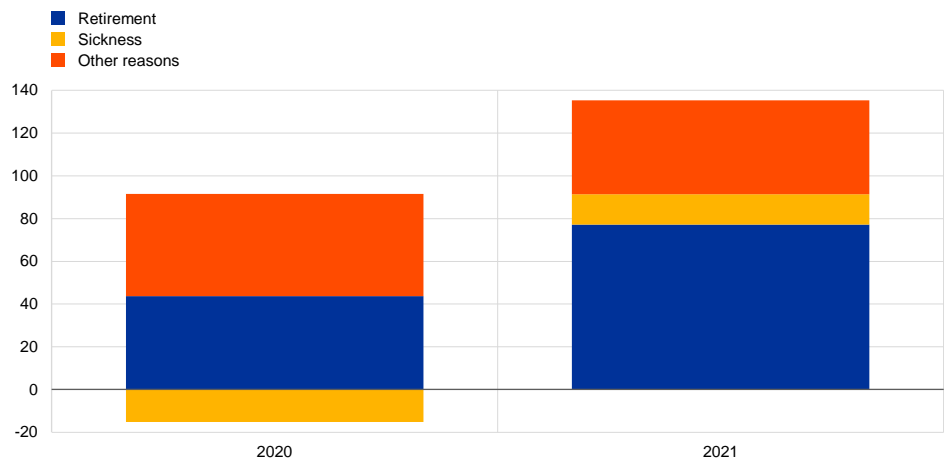
Source: Longitudinal Labour Force Survey (ONS).
Notes: Data in panel a) are shown as three-month moving averages. Although the UK retirement age is currently 66, the only data available are for everyone above the age of 65. Data in panel b) refer to the change in the number of economically inactive people aged 50 to 70 years grouped by the reason for inactivity compared to the average between 2016-2019. The latest observations are for January 2023 for panel a) and December 2021 for panel b).

6   Conclusions

Almost two and a half years after the United Kingdom's exit from the EU's Single Market and the EU Customs Union, there is increasing evidence that Brexit has had negative effects on UK trade and the UK labour market. On the trade side, after controlling for pandemic-related effects, Brexit appears to have caused a significant decline in EU-UK trade in both directions, which, however, may recover to some extent over time, once UK and EU firms have fully adjusted to the new environment. The share of trade in GDP terms has also declined and a number of small and medium-sized UK companies have withdrawn from external trade with

the EU. Regarding the labour market, there is evidence that the end of free movement for EU citizens has also contributed to the recent surge in labour shortages, particularly in sectors with lower-skilled workers. However, there have also been other, and potentially more important, drivers of the decline in UK labour force participation. Considerable uncertainty remains regarding the long-run impacts, including the extent to which the slowdown in EU trade and EU migration could weigh on potential labour supply and future productivity.

2 The impact of the recent inflation surge across households

Prepared by Alina Bobasu, Virginia di Nino and Chiara Osbat

1. Introduction

This article investigates the impact across households of the surge in euro area inflation since mid-2021. High inflation was spurred by a combination of factors. Starting in 2021, the euro area and global economies reopened after the lockdown period against the background of lingering supply bottlenecks. In early 2022, after the Russian invasion of Ukraine, the price of imported energy, which had already been increasing, skyrocketed. This implied a large negative terms-of-trade shock for the euro area.[1] While the surge in inflation was initially triggered predominantly by global factors, the role of domestic demand increased over time with the recovery of the economy after the COVID-19 pandemic restrictions were lifted.[2]

The origins of inflation along with households' characteristics contribute to determining the welfare effects of persistently high inflation and its distributional implications. The exposure to inflation shocks depends on the level and the composition of three main household characteristics: consumption, income and wealth. In the current inflationary episode, the distributional consequences via the consumption channel have been particularly large because the terms-of-trade shock primarily affected necessities such as energy and food. Low-income households spend proportionately more on such necessities and have little scope for substituting expenditure on these items.[3]

Different households also have different margins of adjustment to inflationary shocks depending on their income and balance sheet characteristics.[4] Apart from lowering consumption, households can borrow, tap into their savings, work longer hours and ask for wage increases. However, low-income households tend to have less or no scope for reducing consumption, tapping into savings, accessing credit and bargaining for higher wages. Furthermore, they face a higher unemployment risk if the surge in inflation triggers an economic downturn, which becomes more likely when inflation is driven, to a large extent, by foreign supply

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[1] When assessing the impact of energy price changes on households' purchasing power, the ratio between the GDP and private consumption deflators (or between income and the expenditure deflators) is a useful indicator.

[2] See the box entitled "The role of demand and supply in underlying inflation – decomposing HICPX inflation into components", *Economic Bulletin*, Issue 7, ECB, 2022.

[3] For consumption shares by income quintile, see the box entitled "The impact of the recent rise in inflation on low-income households", *Economic Bulletin*, Issue 7, ECB, 2022. See also Strasser, G., Messner, T., Rumler, F. and Ampudia, M., "Inflation heterogeneity at the household level", *Occasional Paper Series,* ECB, 2023, forthcoming.

[4] For a recent analysis of the implications of the energy price shock in heterogenous agent models, see Auclert, A., Monnery, H., Rognlie, M. and Straub, L., "Managing an Energy Shock: Fiscal and Monetary Policy", *mimeo*, 2023.

shocks.[5] Finally, households can hedge against high inflation via the wealth channel. Holding real assets such as housing or equity is a better hedge against inflation than holding cash. The option of hedging wealth against inflation is typically more easily available to high-income households, whereas low-income households tend to hold relatively more cash or liquid assets.

This article offers an assessment of the effects of the recent inflation surge on euro area households through these channels. Section 2 discusses the empirical evidence related to the expenditure channel by focusing on inflation heterogeneity and its welfare implications across households. Section 3 presents evidence on the income channel. Section 4 analyses the distributional effects of inflation on household wealth via portfolio compositions and the implications of the inflation surge on borrowers. Section 5 concludes the article.

2 The expenditure channel

When inflation results from sharp changes in relative prices, the inflation rates experienced by single households become more heterogeneous, reflecting households' different consumption baskets. The literature on inflation heterogeneity notes that on average through time there is no systematic gap between the inflation experienced by lower- and higher-income households.[6] However, the effects of higher inflation on the welfare of lower-income households tend to be stronger when the prices of energy and food increase relative to average inflation (Chart 1, panel a) and when inflation is more volatile in general.[7] This reflects the higher spending share of low-income households on necessities. According to the 2015 Household Budget Survey for the euro area, households in the bottom income quintile spend about 50% of their total expenditure on rent, food and utilities compared with around 25% for households in the top income quintile (Chart 1, panel b).

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5   Bernanke, B.S., Gertler, M. and Watson, M., "Systematic Monetary Policy and the Effects of Oil price Shocks", *Brookings Papers on Economic Activity, Vol.* 1, 1997, pp. 91-142; Hamilton, J.D. and Herrera, A.M., "Oil Shocks and Aggregate Macroeconomic Behavior: The Role of Monetary Policy*", Journal of Money, Credit and Banking*, Vol. 36, No 2, April 2004, pp. 265-286; Hamilton, J.D., "Historical oil shocks", *NBER WP, No* 16790, February 2011; Kilian, L., "The Economic Effects of Energy Price Shocks", *Journal of Economic Literature*, Vol. 46, No 4, December 2008, pp. 871-909; and Edelstein, P. and Kilian, L., "How sensitive are consumer expenditures to retail energy prices?", *Journal of Monetary Economics*, Vol. 56, No 6, September 2009, pp. 766-779.

6   Hobijn, B. and Lagakos, D., "Inflation inequality in the United States", *The review of income and wealth,* Vol. 51, Issue 4, December 2005.

7   Gürer, E. and Weichenrieder, A., "Pro-rich inflation in Europe: Implications for the measurement of inequality", *German Economic Review*, Vol. 21, Issue 1, 2020; Strasser et. al., op. cit.; Osbat, C., "Measuring inflation with heterogeneous preferences, taste shifts and product innovation: methodological challenges and evidence from micro data", *Occasional Paper Series,* ECB, 2023, forthcoming; Jaravel, X., "Inflation Inequality: Measurement, Causes, and Policy Implications", *Annual Review of Economics*, Vol. 13, No 1, August 2021, pp. 599-629.

Chart 1

Inflation and consumption basket exposure by selected components

a) Annual inflation in headline HICP, energy utilities, food and rent

(annual percentage changes)

- HICP
- Food, alcohol and tobacco
- Actual rentals for housing
- Electricity, gas and other fuels
- Transport
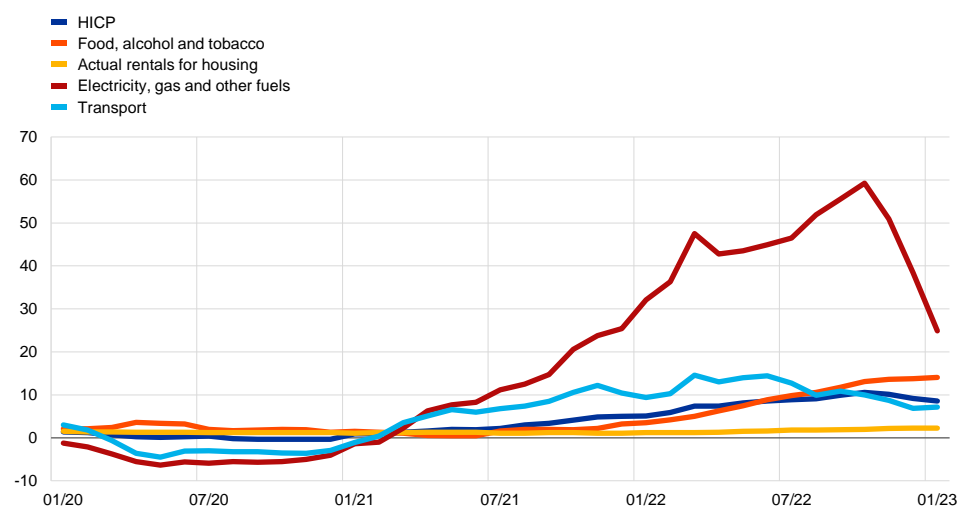
b) Euro area consumption baskets by income quintile

(share of total expenditure, scaled to 1,000)

- Electricity, gas and other fuels
- Actual rentals for housing
- Food and beverages
- Other essentials
- Transport
- Discretionary
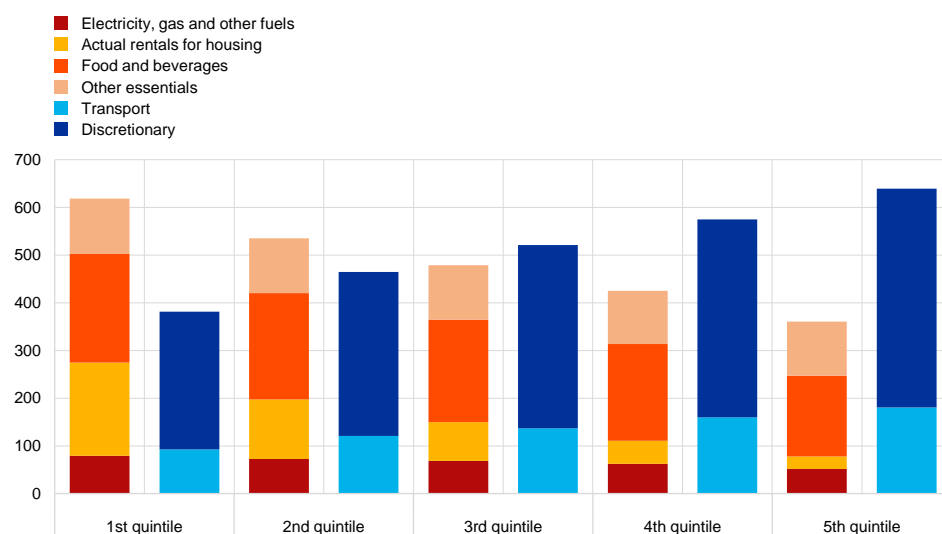
Sources: Eurostat and ECB calculations.
Notes: Classification of Individual Consumption by Purpose (COICOP) weights add up to 1000; "Other essentials" includes health, communications, education, water supply and miscellaneous services related to the dwelling. "Discretionary" includes all remaining COICOP categories. Panel b refers to 2015. The latest observations in panel a are for February 2023.

The gap in inflation experienced by households in the bottom and top 20% of the income distribution peaked in late 2022, at the highest level since the mid-2000s (Chart 2, panel a).[8] Complementing this, evidence based on the ECB Consumer Expectations Survey (CES) shows that the spending growth differential between consumers in the bottom and the top quintiles of the income distribution is

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[8] The gap in experienced inflation can only be measured approximately for recent years because consumption expenditure weights by income class for the euro area are only released with a substantial lag. We updated the 2015 weights using the corresponding relative price changes in each category of consumption. This assumes that the inflation rate of each category is the same across households (i.e. food inflation is the same for every household and only the share of expenditure allocated to food differs).

somewhat narrower than the corresponding gap in perceived inflation.[9] Alongside compositional differences in the spending basket, higher-income consumers reported that they search for deals to curb total spending when inflation rises (Box 1).

Chart 2

Difference in annual inflation between the lowest and highest income quintile households and its decomposition

a) Inflation difference between the lowest and highest income quintile households in the euro area

(percentages)
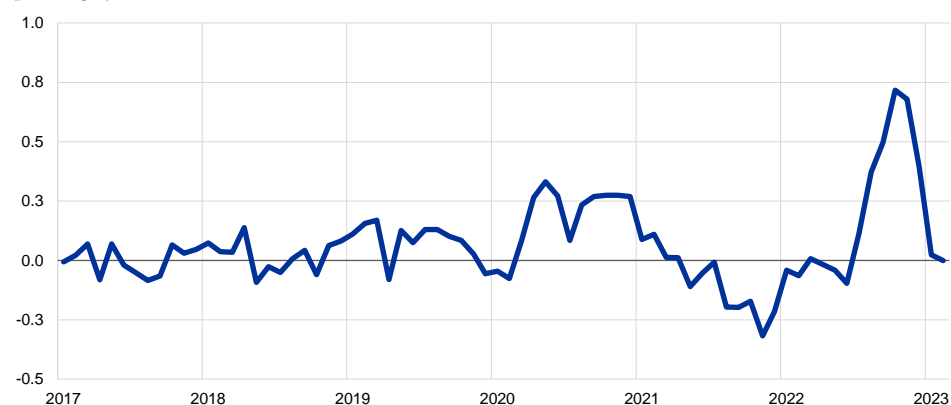
b) Decomposition of the inflation difference between the lowest and highest income quintile households

(percentages)

- Transport
- Food and beverages
- Actual rentals for housing
- Electricity, gas and other fuels
- Recreation, culture, restaurants and hotels
- Others
- HICP Q1 - HICP Q5
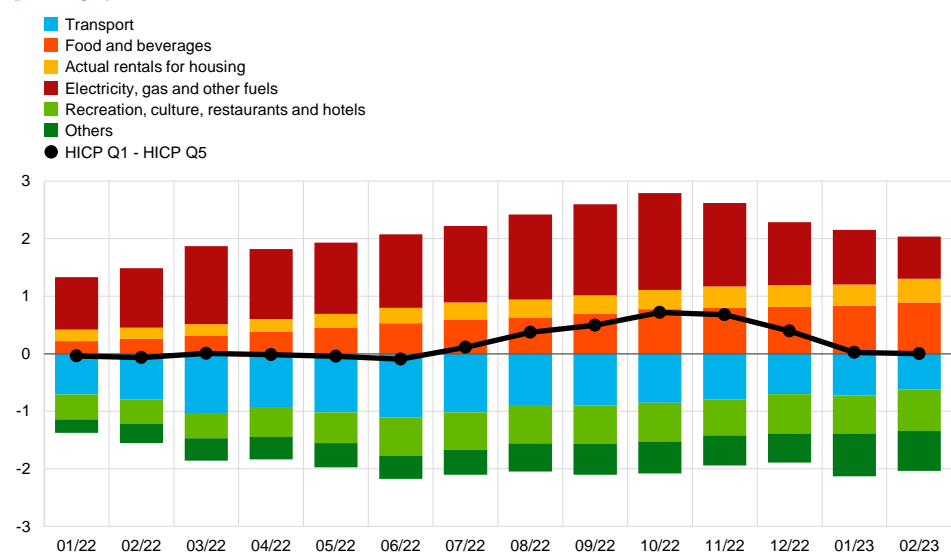
Sources: Eurostat HBS, ISTAT and ECB calculations.
Notes: The contributions of individual components are calculated as the component-level inflation rate multiplied by the difference in the weights of the component in the quintile-specific consumption baskets. Quintile-specific inflation rates are calculated including rents but excluding spending on "imputed rents and owner-occupied housing costs". Weights are based on the 2015 HBS and mechanically updated using the relative price developments in each COICOP sub-component. The latest observations are for February 2023.

Higher-income households have more room to buffer rising prices. They can substitute across consumption classes, reduce consumption by cutting expenses on

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9   See the ECB's Consumer Expectations Survey.

discretionary items such as air travel or recreational services, and they can also "trade down" within each expenditure category. For instance, according to the ECB's CES, consumers in households with an income in the top 20% of the distribution can envisage cutting down future consumption of durables to limit total spending almost three times as much as those with an income in the lowest quintile. Also, higher-income households pay a higher price for comparable grocery items and can react by "trading down" from expensive varieties such as organic foodstuffs to budget products, shifting to cheaper outlets or increasing their shopping intensity to hunt for bargains.[10] The "trading down" phenomenon as a buffer for cushioning adverse income shocks was also documented during the global financial crisis.[11] More recently, Kouvavas highlighted it as a source of bias in inflation measurement owing to a shift in composition towards goods and services of a lower quality.[12]

The welfare loss associated with higher inflation can be quantified by calculating the hypothetical lump-sum transfer that would reinstate the pre-inflation welfare level. Evidence based on the ECB's CES shows that the lump-sum transfer required to compensate households in the lowest income quintile for inflation in 2022 would be three times as large as a fraction of their income, as the transfer to households in the top income quintile (Chart 3).[13] The differential widens to ten times when comparing the bottom and top 5% of the income distribution.

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[10] The GfK (Gesellschaft für Konsumforschung), a market research company, provides information on expenditures on fast-moving consumer goods by individual households in Germany for different income classes. In 2018 the share of expenditure at discounters was around 47% for the lower two income categories and around 33% for the two higher-income classes, indicating more room for the higher-income categories to reduce the cost of the shopping basket by changing their shopping habits.

[11] See the article entitled "Grocery prices in the euro area: findings from the analysis of a disaggregated price dataset", *Economic Bulletin*, Issue 1, ECB, 2015.

[12] Kouvavas, O., "Trading Down and Inflation", *University of Warwick, mimeo*, 2020.

[13] Assuming a Cobb-Douglas utility function, the hypothetical transfers are computed – separately for experienced inflation and perceived inflation – as a weighted sum of inflation by spending category, multiplied by the share of spending on each category in relation to total income. The spending by main category is reported at a quarterly frequency in the CES. Experienced inflation over the previous 12 months by spending category was examined in December 2021 and December 2022. Experienced inflation is based on official statistics of inflation by spending category. See Causa, O., Soldani, E., Luu, N. and Soriolo C., "A cost-of-living squeeze? Distributional implications of rising inflation", *OECD Economics Department Working Papers*, No 1744, December 2022.

Chart 3

Hypothetical lump-sum transfer compensating for inflation in 2022 across income quintiles

(percentages of net nominal income)

■ Compensation for actual inflation
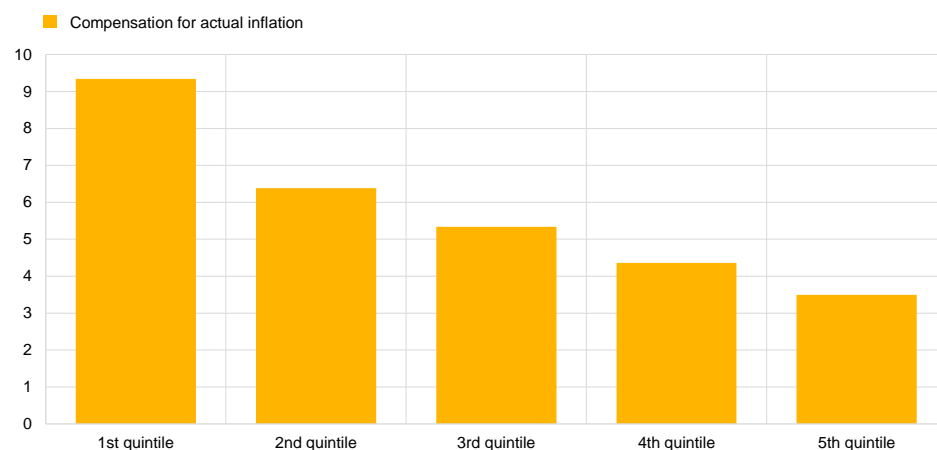
Sources: Eurostat and CES.
Notes: The lump-sum transfers refer to the entire population. These are computed assuming a Cobb-Douglas utility function. This results in income compensations being equivalent to the weighted sum of inflation rates by spending category (experienced and perceived) between t1 and t0, multiplied by the share on total spending of each category in net income at t0.

However, these lump-sum transfers could overstate the actual welfare losses incurred by high-income households, which in 2022 spent more to meet their pent-up demand, in particular for travel and recreation. Evidence based on the ECB's CES shows that in 2022 the spending to income ratio rose more than it normally would for any percentage point increase in the spending share of utilities. Furthermore, there is evidence of unusually low saving ratios for households that spent more on furniture, restaurants and travel. Both types of spending contributed to the surge in inflation. However, in one case, higher spending met basic needs following an exogenous rise in the price of necessities and, in the other case, more spending reflected utility optimisation by consumers allocating time and financial resources to leisure activities after the pandemic restrictions were lifted. Implications are markedly different in the two cases, with welfare losses substantially higher in the case of an exogenous rise in the price of a necessity as compared to a luxury good.[14] Therefore, the lump-sum transfer should be adapted to take discretionary consumer choices into account.

Box 1
How consumer behaviour changes with inflation

Prepared by Virginia Di Nino

In December 2022 CES participants were asked to consider their inflation expectations 12 months ahead and select the measures they might take to curb the effects of expected inflation on their total spending. Different actions were chosen by different income groups to varying degrees (Chart A). The strategy of shopping around for deals was most frequently reported, especially by

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[14] See Attanasio, O.P. and Pistaferri, L., "Consumption Inequality", *Journal of Economic Perspectives,* Vol. 30, No 2, 2016, pp. 3-28 and Fang, L., Hannusch A. and Sil, P., "Luxuries, Necessities, and the Allocation of Time", *Working Paper 2021-28*, Federal Reserve Bank of Atlanta, December 2021.

consumers in the top 20% of the income distribution who reported it 40% of the time, compared with 35% reported by consumers in the bottom 20% of the distribution. This reflects the greater extent to which higher earners can "trade down" their shopping basket, while low-income consumers are already buying mainly budget items. Also, the option to bring forward major purchases of durable goods was selected almost twice as often by consumers with an income above the median who, in general, purchase durable and large items more frequently than those in the lower-income quintiles. In terms of income adjustment, only one in ten consumers would directly ask for wage compensation, and this occurred more often among those with high incomes, reflecting their relatively stronger bargaining power. Conversely, consumers with low incomes would search for alternative means, such as a second job or working longer hours, to compensate for the more expensive cost of living. On average, consumers with a lower income chose this strategy almost three times more frequently than demanding wage compensation. Overall, survey results seem to confirm that consumers with high incomes have more of a buffer to cushion the impact of higher prices on their welfare.

Chart A

Strategies to cope with price inflation across income quintiles

(percentages)
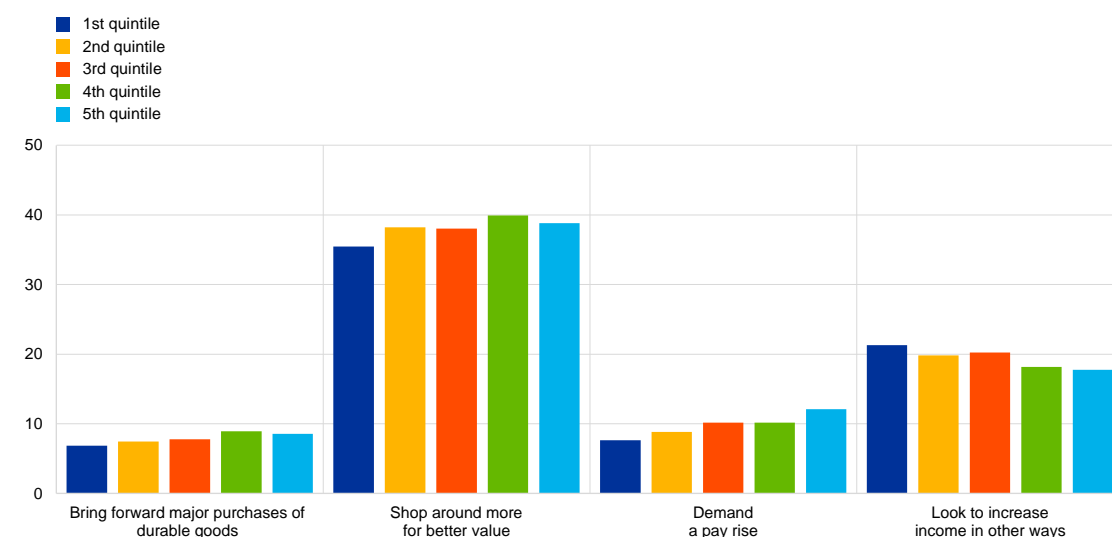
Source: CES.
Notes: The question in the CES reads as follows: "Please think about your expectations for changes in prices in general over the next 12 months. Which of the following actions, if any, are you taking, or planning to take, over the next 12 months? Please select all options that apply. 1. Bring forward major purchases of durable goods. 2. Reduce usual spending and put aside more money. 3. Shop around more actively for goods and services with better value. 4. Reduce the amount of money usually put aside and increase spending. 5. Liquidate (some or all) savings to finance spending. 6. Demand a pay rise from your current employer. 7. Look to increase your income in other ways (e.g. change jobs, take on a second job, work more hours with current employer). 8. None of the above."

3 The income channel

Inflationary shocks transmit differently to households depending on their income and its composition. Wages and social benefits largely make up the income of lower- and middle-income households (Chart 4). While minimum wages and pensions are indexed to inflation in many countries, providing some protection to households at the lower end of the income distribution, general wages typically

adjust to inflation partially and with some lags.[15] By contrast, higher-income earners receive around 40% of their income from financial investments and entrepreneurial activities, which adjust more rapidly to inflation, offering a better hedge, also owing to income source diversification (Section 4).[16] In the current inflation episode, in an environment of resilient demand, many firms were able to increase profit margins, also recouping losses experienced during the pandemic restrictions. Part of these profits were redistributed as dividends, benefiting those households that hold equities in their portfolios.

Chart 4
Decomposition of gross income by sources and across income quintiles

(percentages)

- Compensation of employees
- Gross operating surplus and mixed income
- Net property income
- Net transfers
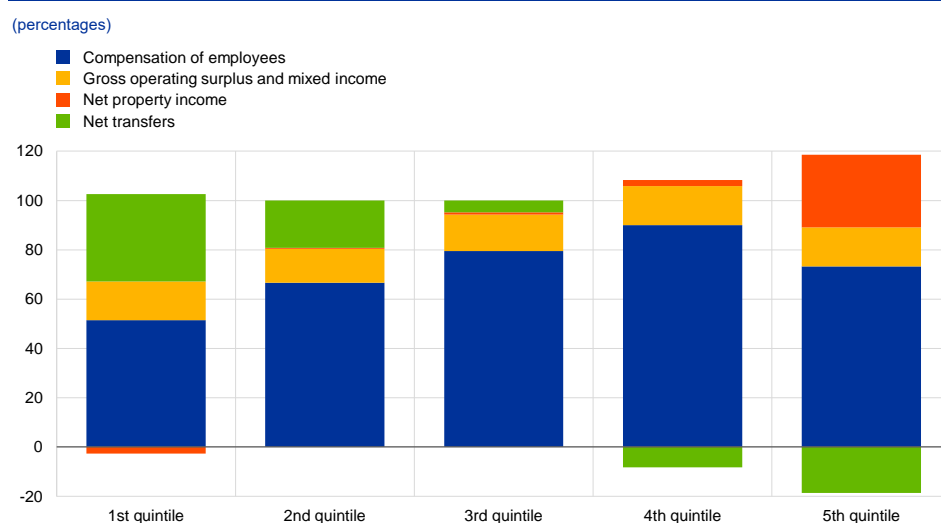
Sources: Eurostat income, consumption and survey data.
Note: The latest observations are for 2021.

Low- and middle-income earners report being more vulnerable to purchasing power losses. Low-income workers could rely on collective wage bargaining power through unions. However, based on evidence from the ECB's CES they seem aware that individually their leverage is limited. Their income expectations react less significantly to rising inflation and, when queried, they are more likely to search for an alternative income source (e.g. by working more hours or taking on a second job) than to ask for a pay rise. High-income households, by contrast, are more likely to ask for pay compensation (Box 1). Additionally, the ECB's CES notes that the probability of losing one's job in an economic slowdown declines steadily as income

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15 Wage sluggishness prevents adjustments in general. This holds true for rising prices and also in the case of adverse shocks to growth. See Consolo, A., Koester, G., Nickel, C., Porqueddu, M. and Smets, F., "The need for an inflation buffer in the ECB's price stability objective – the role of nominal rigidities and inflation differentials", *Occasional Paper Series*, No 279, ECB, September 2021 and Gautier, E., Conflitti, C., Faber, R.P., Fabo, B., Fadejeva, L., Jouvanceau, V., Menz, J., Messner, T., Petroulas, P., Roldan-Blanco, P., Rumler, F., Santoro, S., Wieland, E. and Zimmer, H., "New facts on consumer price rigidity in the euro area", *Working Paper Series*, No 2669, ECB, June 2022.

16 Several studies document a positive relationship between inflation and income inequality. Romer, C.D. and Romer, D.H., "Monetary Policy and the Well-being of the Poor", *Working Paper Series,* No 6793, *National Bureau of Economic Research,* 1998, find that in the United States, higher unanticipated inflation corresponds to a higher-income share for the poor and a lower Gini coefficient. Bulir, A., "Income inequality: Does inflation matter?", *Working Paper Series*, No 1998/007, International Monetary Fund, 1998, finds that past inflation affects current levels of income inequality. Binder, C., "Inequality and the inflation tax", *Journal of Macroeconomics*, Vol. 61, 2019, finds that the correlation between inflation and income inequality has changed over time, becoming negative notably in Europe.

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rises, with low-income individuals regularly reporting higher expected unemployment rates.

This time, employment dynamics did not contribute to inequality through the income channel. In this regard, it is interesting to compare how employment across income groups evolved in different episodes. At the beginning of the pandemic lockdowns, contact-intensive services skewed unemployment risks and income losses towards workers in lower-income quintiles, who tend to be more frequently employed in hospitality and restaurants.[17,18] However, unlike during the global financial crisis, employment was more resilient in well-paid sectors (Chart 5). At the same time, large-scale national job retention schemes – particularly short-time work schemes which were introduced in almost all EU Member States – succeeded in preventing layoffs and containing unemployment, protecting the most vulnerable workers.[19] As a result, employment dropped less significantly in the economic sectors with lower average income rates. Even more so, since pandemic restrictions were lifted in the second half of 2021, employment has recovered especially well in those contact-intensive sectors that had initially been more affected by the pandemic. The ECB's CES shows that unemployment rates increased more significantly for workers with below-median incomes in the second half of 2020.They then fell by a greater degree for the same income class in the course of 2021 (Chart 6).[20] At the same time, no further improvements were visible in 2022, and early signs of a general deterioration emerged in the second half of the year.

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[17] European Commission analysis based on European Union Statistics on Income and Living Conditions (EU-SILC) statistics reveals that in the early stages of the pandemic, the income losses for the low-income groups were three to six times higher than for their peers in the high-income groups across EU Member States.

[18] See the box entitled "COVID-19 and income inequality in the euro area" in the article "Monetary policy and inequality", *Economic Bulletin*, Issue 2, ECB, 2021.

[19] See the article entitled "Automatic fiscal stabilisers in the euro area and the COVID-19 crisis", *Economic Bulletin,* Issue 6, ECB, 2020.

[20] The EU-SILC of 2021 shows an overall improvement in equality between 2019 and 2021 reflected in reduced "at-risk-of-poverty rates", higher median disposable and employment income, especially for the first quintile. Government support, targeted to lower-income quintiles, has largely contributed to these achievements. See also the box entitled "The labour market recovery in the euro area through the lens of the ECB Consumer Expectations Survey", *Economic Bulletin*, Issue 2, ECB, 2022.

Chart 5

Average income and employment developments by economic activity

(x-axis: average income deciles; y-axis: percentage change in employment)

a) Global financial crisis
b) COVID-19
c) Surge in inflation
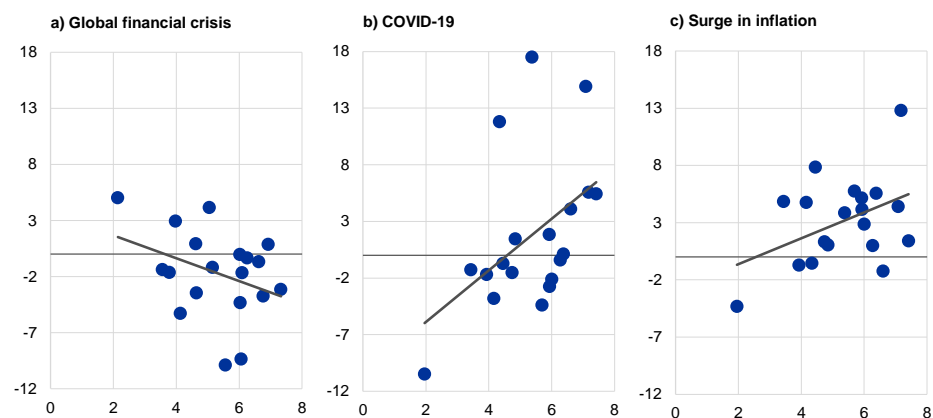
Sources: Eurostat labour force survey and Survey on Income and Living Conditions (EU-SILC).
Notes: "Global financial crisis" refers to the period from the fourth quarter of 2008 to the fourth quarter of 2010; "COVID-19" refers to the period from the fourth quarter of 2019 to the second quarter of 2021; "Surge in inflation" refers to the period from the third quarter of 2021 to the third quarter of 2022. The latest observations by average income decile are for 2021. The latest observations of employment by sector are for the third quarter of 2022. The sectors are classified according to the NACE, which is the statistical classification of economic activities in the European Community.

Chart 6

Dynamics of unemployment rates by income class

(percentage points)

- 1st tertile
- 2nd tertile
- 3rd tertile
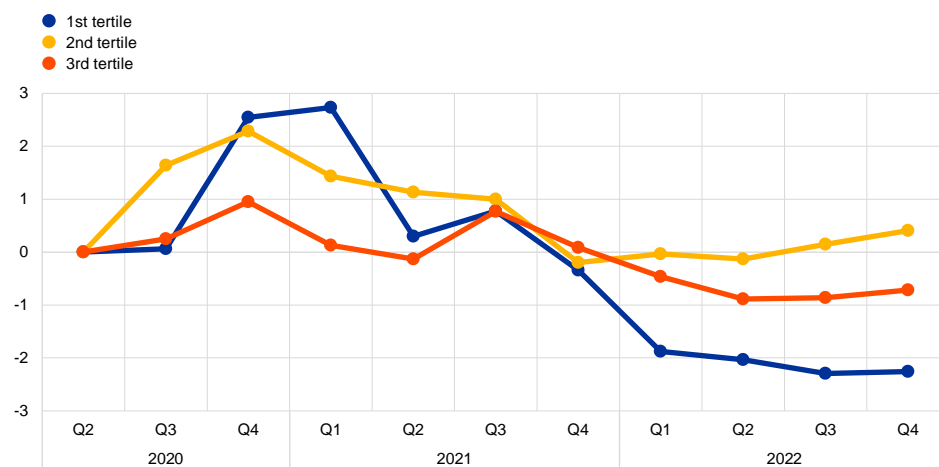
Source: CES.
Notes: Unemployment rates are the ratio between the unemployed population and the labour force, calculated separately for each income group. Differences in unemployment rates are relative to the unemployment rate in the second quarter of 2020. The latest observations are for the fourth quarter of 2022.

Households with low earnings have thinner savings buffers and are therefore in greater need of government measures to prevent financial distress. Lower-income households also have lower saving rates, lower accumulated savings and, by extension, less room to buffer cost increases when faced with adverse shocks.[21] They often dissave, with a negative median saving rate of -5.86% for the bottom income quintile, whereas those in the top quintile of the income distribution save

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[21] See Battistini, N., Di Nino, V., Dossche, M. and Kolndrekaj, A., "Energy prices and private consumption: what are the channels?", *Economic Bulletin*, Issue 3, ECB, 2022.

around 40% of their net disposable income.[22] Based on saving flows reported on a quarterly basis in the ECB's CES, the share of dissavers among households in the bottom income quintile is estimated to have risen by 5 percentage points in 2022 to 25% compared with 2021. The saving rate for those in the bottom income quintile with positive savings fell by 10 percentage points, four times more than the drop estimated for consumers in the top income quintile. The ECB's CES asked respondents to grade the perceived adequacy of fiscal measures in protecting their financial situation from the impact of high energy prices.[23] Despite the very substantial increase in energy prices, the average perceived adequacy at the end of 2022 improved compared with the previous year.[24] The negative association between the size of the saving drops in 2022 and the perceived adequacy of government measures indicates that lower-income households have a greater need for fiscal support (Chart 7). The higher the income, the lower the sacrifice in savings and the higher the average adequacy score.

Chart 7

Changes in savings and adequacy scores of fiscal measures

(left-hand scale: percentage of net nominal income; right-hand scale: perceived adequacy of intervention on a scale of 0 to 10)

- Fiscal adequacy
- Changes in savings in 2022

Sources: Eurostat and CES.
Notes: The question on fiscal adequacy was formulated as follows: "Many governments are currently taking measures to ease the burden on households of higher energy prices. To what extent do you think that the measures in your country will be sufficient to maintain your household's usual spending on goods and services? Scale: 0 = completely insufficient, 10 = fully sufficient". The change in the saving rate in 2022 only considers consumers who were net savers. In the CES, quarterly saving flows are reported in intervals; these were mapped into point estimates through a double-censored Tobit model of savings using households' characteristics and total spending. In the estimation, savings are assumed to fall within a range defined by the upper and the lower value in the interval.

Box 2
Inflation, fiscal policy and inequality

Prepared by Virginia Di Nino and Maximilian Freier[25]

Governments across the euro area acted to mitigate the impact of high inflation by implementing measures to contain price increases and by supporting households and firms through direct

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[22] Eurostat income, consumption and wealth experimental statistics.

[23] Consumers were asked in October 2021 and December 2022 to grade the adequacy of their national fiscal measures in preserving their financial conditions from the negative impact of high energy prices on a scale from 0 (completely inadequate) to 10 (fully adequate).

[24] See the article entitled "Fiscal policy and high inflation", *Economic Bulletin*, Issue 2, ECB, 2023.

[25] The authors would like to thank Simeon Bischl and Aleksandra Kolndrekaj for their valuable research assistance and contribution to this box.

transfers and tax relief.[26] This box assesses the impact of these fiscal measures on households' income inequality scores in 2022 and compares them with the perceived effects reported in the ECB's CES.

Overall, fiscal measures taken by governments have offset the inequality gap opened up by high consumer price inflation. The ESCB Working Group on Public Finance, together with the European Commission's Joint Research Centre, has assessed the distributional impact of government measures to compensate for high consumer inflation in 2022.[27] Although the size and impact of the packages providing fiscal relief for energy prices have varied across countries, these inflation compensation measures have curbed the widening of after-tax income inequality in the euro area. Chart A, panel a shows the change in the Gini coefficient for disposable household income between 2021 and 2022. For the euro area, the inflationary shock resulted in an uptick in income inequality.[28] This was offset by discretionary energy-related fiscal support to households. Lower-income households also benefited more from other government transfers and non-energy related policy changes. The inequality gap has now closed. The income quintile share ratio – an alternative measure of inequality that calculates the ratio of the total income received by the 20% of the population with the highest income to the 20% with the lowest – paints a very similar picture (Chart A, panel b).

Chart A
The effect of fiscal measures on the euro area Gini coefficient and the at-risk-of-poverty rate

a) Gini coefficient

b) Income quintile share ratio

Source: Amores, A. et al. (forthcoming).
Notes: The results are calculated from microsimulations based on EUROMOD and data from EU-SILC. Other nominal income growth is a result of policy changes unrelated to extraordinary inflation compensation measures, such as changes to social benefits or tax schedules. Lower values of the Gini coefficient denote lower inequality. The euro area aggregate is proxied by Germany, Greece, Spain, France, Italy and Portugal.

The ECB's CES asked respondents to report about the type of support they received from their government aimed at tackling the effects of high energy prices on their balance sheet. Those in the bottom 20% of the income distribution reported having received direct and/or welfare payments compensating for increased energy spending more frequently, in line with economic data. Conversely, households in the top 20% of the income distribution reported having primarily benefited from untargeted measures like energy and fuel price caps (Chart B).[29] Moreover, the respondents with low incomes who reported having benefited from direct payments have improved their perception of fiscal measures adequacy by more, in line with compensation measures targeting this income class.

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[29]   Consumers in December 2022 were also asked to report what sort of support they received. The most frequent responses were direct payments either to compensate for increased energy costs or welfare payments and discounts on energy and/or fuel consumption, followed by subsidised public transport.

Chart B

Fiscal measures by income quintile

(percentage of respondents)

- 1st quintile
- 2nd quintile
- 3rd quintile
- 4th quintile
- 5th quintile
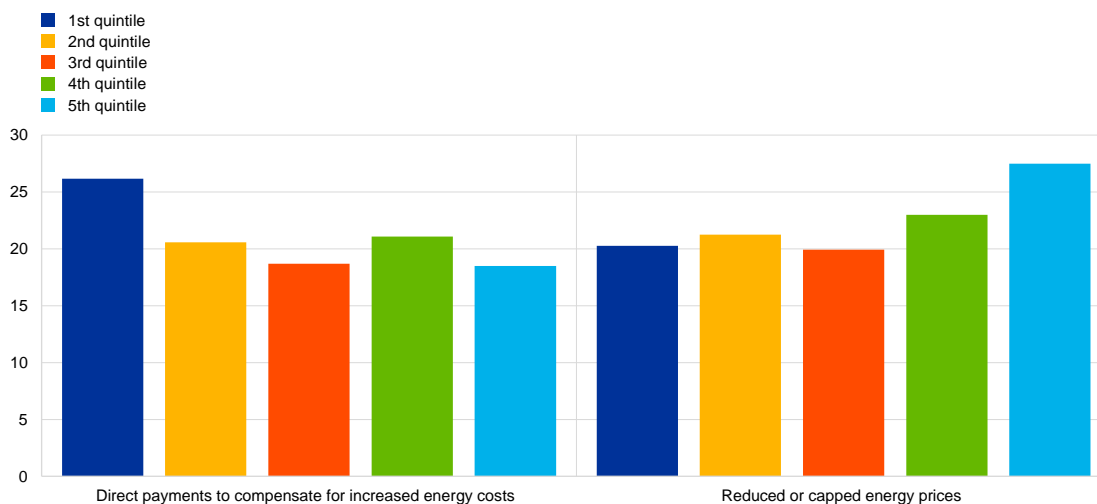
Source: CES.
Note: The vertical axis plots the percentage of consumers who reported having benefited from fiscal support measures.

In conclusion, while the bulk of government measures did not target only lower-income households, they did mitigate the inflation gap created by high energy-driven consumer price inflation to some degree and this is reflected in household survey data. At the same time, the ECB's CES results also show that fiscal measures did not exclusively target the most vulnerable social groups and that benefits were felt by households across the income spectrum. Indeed, some measures favoured higher earners over lower-income households, raising questions regarding both their efficiency and their economic side effects.

4 The wealth channel

There is significant inequality in household wealth and balance sheet portfolio compositions along the wealth distribution. In 2022, ECB distributional wealth accounts showed that the bottom quintile of euro area households held only around 1% of total assets, while the top quintile owned around 70% (Chart 8, panel a). Financial wealth is even more concentrated, with around 90% held by households in the top quintile. In the euro area, the leverage ratio for households in the top 20% of the wealth distribution remained low at below 10% and stayed largely constant over time. In addition, the leverage ratio for those in the bottom 20% rose over time, reaching nearly 160% and indicating that this group relied heavily on debt to finance their investment plans, overexposing them to interest rate hikes.[30] This section first assesses how inflation can directly affect net worth valuations and alter the distribution of wealth across the population by lowering the real value of assets and liabilities. It then discusses an indirect channel of inflation transmission to wealth

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[30] Around 60% of the total leverage in the bottom quintile of the wealth distribution is attributed to mortgage loans.

inequality working through households' heterogenous exposure to changes in monetary policy.

Chart 8

Assets and liabilities, and portfolio composition across the net wealth distribution

a) Assets by net wealth quintile

(EUR thousands per household)
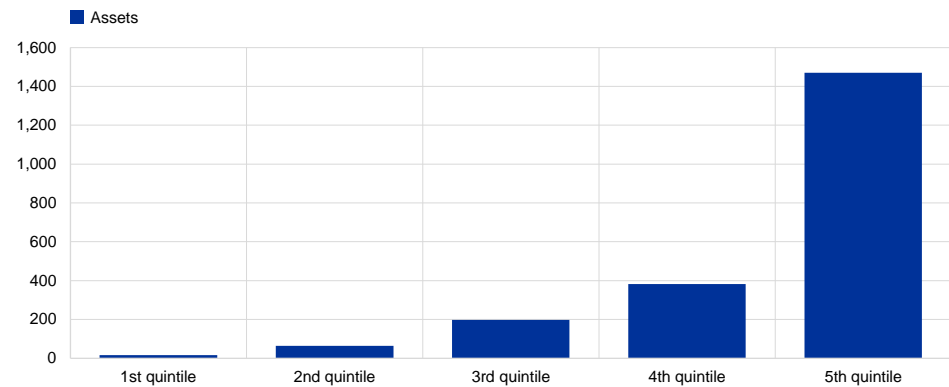
■ Assets

b) Portfolio composition by net wealth quintile

(percentage of assets)

■ Deposits
■ Debt securities
■ Equities
■ Investment funds
■ Life insurance
■ Housing
■ Business
■ Debt
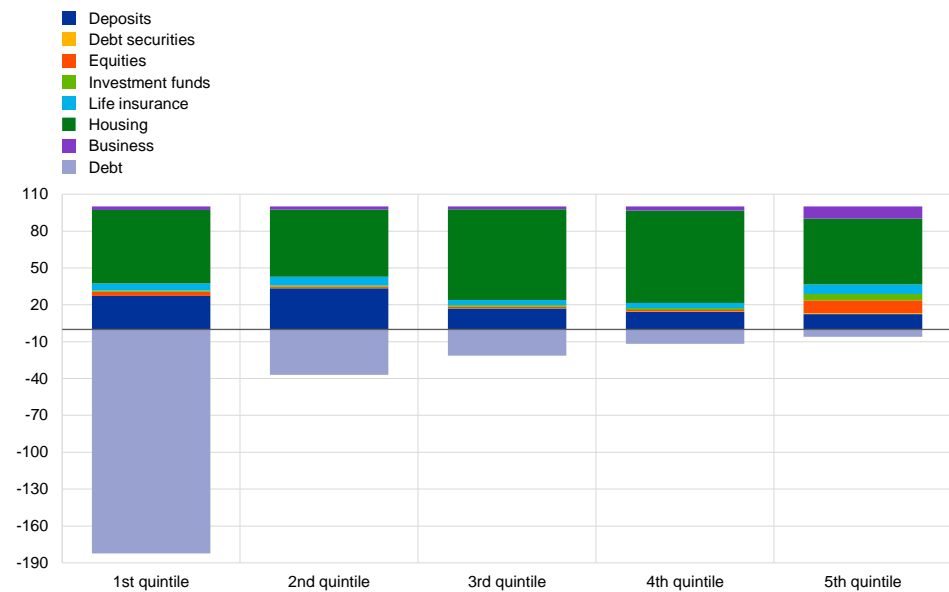
Sources: ECB Experimental Distributional Wealth Accounts and ECB calculations.
Notes: Panel a): adjusted total assets/liabilities (financial and net non-financial) based on net wealth concept, per household. Panel b): debt includes both mortgage and consumer loans and is represented with a minus. The latest observations are for the third quarter of 2022.

The composition of assets and liabilities across the wealth distribution determines the extent to which high inflation can affect wealth inequality. In general, owing to income uncertainty and barriers to entry in most markets for non-monetary financial assets, poorer households hold a greater proportion of their wealth in cash or bank deposits. While cash and bank deposits are easily accessible, they are also subject to purchasing power erosion caused by inflation. In contrast, richer households are more likely to split their holdings in equities, investment funds

and bonds, which offer better protection against inflation, owing to portfolio diversification (Chart 8, panel b). Early studies focusing on the mid-1950s to 1970s concluded that high inflation leads to a drop in wealth inequality by redistributing wealth from lenders to borrowers through changes in the real value of nominal assets and liabilities.[31] However, while higher inflation does erode the real value of nominal assets, it can, in certain circumstances, also lower the real value of nominal liabilities such as mortgages. Some empirical analyses confirm that moderate unexpected inflation substantially redistributes wealth from richer, older households that are net creditors to younger, middle-class households with fixed mortgage debt.[32] However, if expectations adjust, an inflation premium will erase the initial benefit for borrowers by increasing the debt burden. The CES shows that fewer lower earners are indebted, but those that are allocate more of their income to debt repayments. At the bottom of the income distribution, a third of income is used for debt payments (including non-mortgage consumer loans), whereas at the top, less than 15% is allocated for debt repayments (Chart 9). Finally, when higher unexpected inflation reduces the real interest income of low and medium-income households and increases the profit income of high-income households, the Fisher channel is weakened.[33] In this regard, wealth composition plays a salient role in the transmission of inflationary shocks.

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[31] See Bach, G.L. and Ando, A., "The Redistributional Effects of Inflation", *The Review of Economics and Statistics*, Vol. 39, No 1, 1957 and Wolff, E., "The Distributional Effects of the 1969-75 Inflation on Holdings of Household Wealth in the United States", *Review of Income and Wealth*, Vol. 25, No 2, 2005, pp. 195-207.

[32] Doepke, M. and Schneider, M., "Inflation and the Redistribution of Nominal Wealth", *Journal of Political Economy*, Vol. 114, No 6, 2006, pp. 1069-1097, and Cardoso, M., Ferreira, C., Leiva, J.M., Nuño, G., Ortiz, Á. and Rodrigo, T., "The heterogeneous Impact of Inflation on Households' Balance Sheets", *Working Paper Series, No 176, Red Nacional de Investigadores en Economía,* 2022, note that the results are driven especially by households in the upper-income quantile.

[33] Heer, B. and Süssmuth, B., "Effects of inflation on wealth distribution: Do stock market participation fees and capital income taxation matter?", *Journal of Economic Dynamics and Control*, Vol. 31, Issue 1, 2007, pp. 277-303.

Chart 9

Debt payment-to-income ratio and share of indebted households across the income distribution

(percentages)

■ Debt payment on income
■ Share of indebted
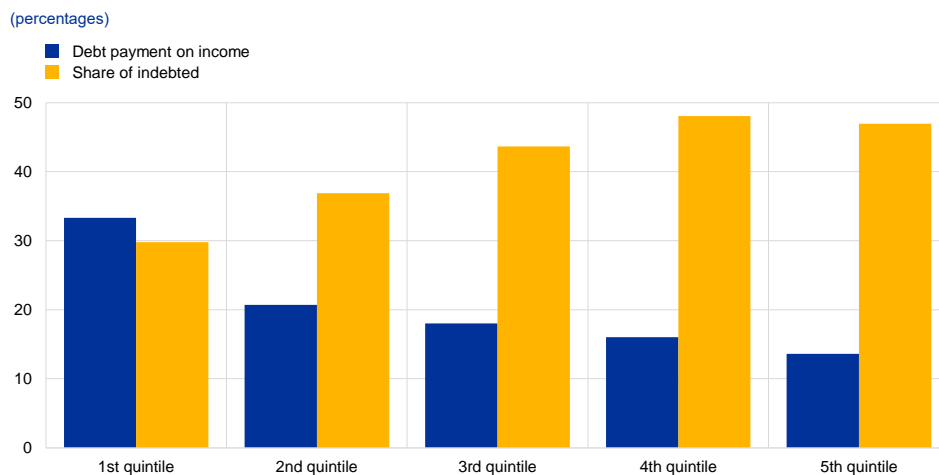
Sources: CES and ECB calculations.
Note: The chart shows the share of net income in households with positive debt allocated to debt payments and the share of households with positive debt.

The wealth channel tends to work asymmetrically when inflation is largely driven by external supply shocks, as is the case in the current episode. This is because the Fisher channel only works fully if income adjusts to inflation, lifting the payments burden from indebted households, which are usually those at the bottom of the wealth distribution. This would happen more naturally when inflation is driven by demand shocks. However, as discussed in Section 3, incomes have hitherto stagnated in the current inflationary episode. At the same time, inequality in savings has been exacerbated by inflationary cost-push shocks, to the extent that low-income households have been forced to tap more into their liquid savings.[34]

The wealth distribution is strongly affected by asset valuations. Changes in the net wealth of euro area households are primarily driven by gains and losses on real estate and equity holdings, as well as portfolio rebalancing effects which, in turn, have followed house and stock prices very closely. However, because house prices are less volatile than equity prices and housing wealth is more evenly distributed across households, their correlation with inequality in real estate holdings is weaker than the correlation between equity prices and holdings, which are predominantly held by richer households.[35] Financial wealth inequality in the form of equities, as measured by the Gini coefficient, increased steadily during the sovereign debt crisis, but has moved significantly less since then (Chart 10).

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[34] See the box entitled "The recent drivers of household savings across the wealth distribution*", Economic Bulletin*, Issue 3, ECB, 2022.

[35] Adam, K. and Tzamourani, P., "Distributional Consequences of Asset Price Inflation in the Euro Area", *European Economic Review*, Vol. 89, 2016, pp. 172-192.

(left-hand scale: annual percentage changes; right-hand scale: Gini coefficient, annual percentage changes)

- Equity prices
- Valuation and other changes in financial wealth
- Gini coefficient (right-hand scale)
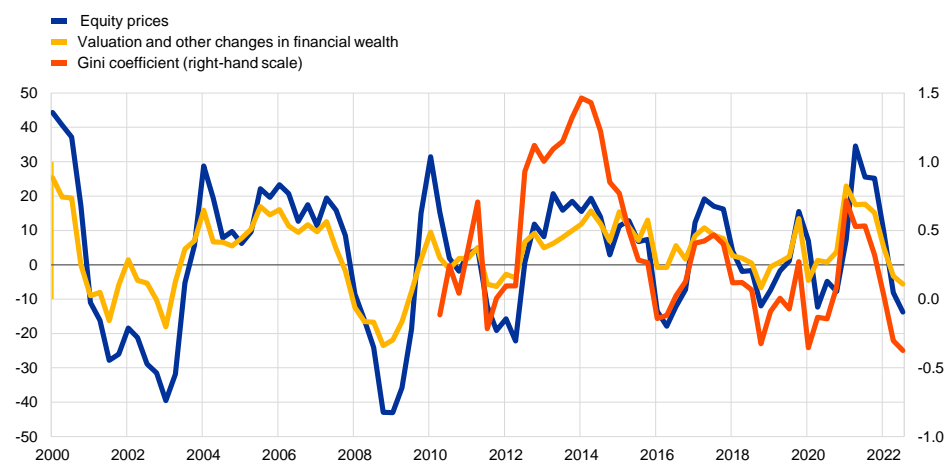
Sources: Eurostat, ECB Experimental Distributional Wealth Accounts and ECB calculations.
Notes: The Gini coefficient is calculated based on distributional wealth accounts statistics, only available with a reference date of 2009. Equity prices are measured by the Dow Jones EURO STOXX 50 Price Index, which, while relatively narrow, correlates with the financial wealth valuation indicator. The latest observations are for the third quarter of 2022.

5 Conclusions

This article reviews the different channels of the heterogenous impact of inflation across households and assesses their effects in the current inflationary episode. The analysis of data from various sources suggests that the strength of the three main channels has been different.

The expenditure channel has been particularly strong because low-income households are more exposed to increases in the prices of necessities such as energy and food. The prices of these necessities increased far more than other prices following the sharp surge in commodity prices since mid-2021. This effect is amplified by the fact that low-income households have limited scope for "trading down" from expensive varieties or substituting spending across different classes.

By contrast, a resilient labour market and fiscal support measures have mitigated the adverse distributional effects of high inflation on households through the income channel. Nevertheless, when assessing the impact of high inflation in 2022 on saving behaviour, low-income households again appear to have suffered disproportionately. Despite the fiscal relief available, more households dissaved, and those with limited savings had to make the most significant sacrifices.[36] This is consistent with government support increasingly being perceived as inadequately compensating for the loss in purchasing power by lower-income consumers.

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[36] See also the box entitled "Who foots the bill? The uneven impact of the recent energy price shock", *Economic Bulletin*, Issue 2, ECB, 2023.

So far, the impact of inflation via the wealth channel is less clear as inflation worked asymmetrically. It has not led to a redistribution of nominal wealth to borrowers by reducing the real value of their debt, as incomes have not sufficiently adjusted to inflation so far. Still, it has reduced the real value of the net assets predominantly owned by higher-income households. When inflation is mostly driven by a terms-of-trade shock, incomes do not rise enough to reap the benefit of the falling real value of debt.

Monetary and fiscal policy each have a role to play in addressing the impact of high inflation. Fiscal policy can best contribute to alleviating the impact of the adverse terms-of-trade shock – especially on lower-income households – through targeted, temporary and tailored income support measures. Monetary policy can best contribute by bringing inflation back to a level in line with the price stability objective.[37] Central to this is the anchoring of inflation expectations, so as to avoid a wage-price spiral. By supporting lower-income households specifically, whose livelihoods depend strongly on the purchasing power of wages, fiscal policy also indirectly helps to ward off a wage-price spiral.

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[37]   In line with the literature suggesting that income inequality tends to decline visibly when monetary policy succeeds in anchoring inflation at low and stable levels: see Hobijn, B. and Lagakos, D., "Inflation Inequality in the United States", *Review of Income and Wealth*, Vol. 51, Issue 4, 2005, pp. 581-606 and "The distributional footprint of monetary policy", *Annual Economic Report*, Bank for International Settlements, 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
2020	-3.0	-2.8	-11.0	-4.3	2.2	-6.1	1.3	1.7	1.2	0.9	0.0	2.6	0.3
2021	6.3	5.9	7.6	2.1	8.1	5.4	4.0	3.0	4.7	2.6	-0.3	0.9	2.6
2022	3.2	2.1	4.1	1.0	3.0	3.5	9.5	6.8	8.0	9.1	2.5	1.9	8.4
2022 Q2	-0.2	-0.1	0.1	1.2	-2.3	0.9	9.7	6.5	8.6	9.2	2.5	2.1	8.0
Q3	1.4	0.8	-0.1	-0.3	3.9	0.4	10.4	7.3	8.3	10.0	2.9	2.6	9.3
Q4	0.3	0.6	0.1	0.0	0.6	0.0	10.1	7.6	7.1	10.8	3.8	1.8	10.0
2023 Q1	.	0.3	.	.	2.2	0.1	.	.	5.8	10.2	3.6	1.7	8.0
2022 Nov.	-	-	-	-	-	-	10.3	7.7	7.1	10.7	3.8	1.5	10.1
Dec.	-	-	-	-	-	-	9.4	7.2	6.5	10.5	4.0	1.8	9.2
2023 Jan.	-	-	-	-	-	-	9.2	7.2	6.4	10.1	4.3	2.2	8.6
Feb.	-	-	-	-	-	-	8.8	7.3	6.0	10.4	3.3	2.1	8.5
Mar.	-	-	-	-	-	-	.	.	5.0	10.1	3.2	0.8	6.9
Apr. [3]	-	-	-	-	-	-	.	.	.	.	.	.	7.0

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.
3) The figure for the euro area is an estimate based on provisional national data, as well as on early information on energy prices.

1.2 Main trading partners, Purchasing Managers' Index and world trade

	Purchasing Managers' Surveys (diffusion indices; s.a.)									Merchandise imports[1]		
	Composite Purchasing Managers' Index						Global Purchasing Managers' Index[2]					
	Global[2]	United States	United Kingdom	Japan	China	Memo item: euro area	Manufacturing	Services	New export orders	Global	Advanced economies	Emerging market economies
	1	2	3	4	5	6	7	8	9	10	11	12
2020	47.5	48.8	46.5	42.4	51.4	44.0	48.5	46.3	45.3	-4.0	-4.1	-4.0
2021	54.9	59.6	55.9	49.4	52.0	54.9	53.7	55.2	52.1	11.3	9.9	12.8
2022	50.6	50.7	53.0	50.3	48.2	51.4	49.9	51.0	47.8	2.5	4.1	0.8
2022 Q1	52.2	54.9	58.3	48.7	48.0	54.2	51.0	52.6	49.1	0.9	3.0	-1.4
Q2	51.7	54.0	55.0	52.1	44.9	54.2	50.2	52.1	48.8	-0.1	-0.3	0.0
Q3	50.0	47.2	50.3	50.2	51.8	49.0	49.9	50.1	47.5	0.4	-0.5	1.5
Q4	48.4	46.5	48.5	50.1	47.9	48.2	48.7	48.3	47.0	-2.1	-2.5	-1.6
2022 July	50.9	47.7	52.1	50.2	54.0	49.9	50.7	51.0	48.6	1.2	0.6	1.9
Aug.	49.3	44.6	49.6	49.4	53.0	49.0	49.8	49.1	47.5	0.9	-0.6	2.6
Sep.	49.9	49.5	49.1	51.0	48.5	48.1	49.1	50.1	46.5	0.4	-0.5	1.5
Oct.	49.3	48.3	48.2	51.8	48.3	47.3	49.5	49.2	47.3	-0.2	-1.0	0.6
Nov.	48.0	46.4	48.2	48.9	47.0	47.8	48.1	47.9	47.0	-1.1	-1.6	-0.4
Dec.	47.9	45.0	49.0	49.7	48.3	49.3	48.6	47.7	46.7	-2.1	-2.5	-1.6

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 Economic activity

2.1 GDP and expenditure components
(quarterly data seasonally adjusted; annual data unadjusted)

	Total	GDP								External balance [1]		
		Domestic demand										
		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)												
2020	11,507.4	11,101.1	5,954.5	2,577.8	2,527.5	1,228.4	687.8	604.5	41.3	406.3	5,208.4	4,802.1
2021	12,376.1	11,899.2	6,317.1	2,730.6	2,722.7	1,382.6	766.1	566.7	128.8	476.9	6,102.5	5,625.6
2022	13,399.1	13,186.8	7,041.4	2,881.9	3,038.8	1,559.1	844.8	627.1	224.7	212.3	7,338.0	7,125.7
2022 Q1	3,255.1	3,177.3	1,690.5	705.3	724.4	377.0	200.5	145.0	57.1	77.8	1,722.4	1,644.6
Q2	3,321.6	3,256.0	1,741.4	713.7	747.5	389.0	207.3	149.2	53.4	65.6	1,835.5	1,769.9
Q3	3,370.2	3,363.4	1,788.6	722.3	787.4	393.2	217.3	174.9	65.1	6.8	1,898.7	1,891.9
Q4	3,441.4	3,374.5	1,818.8	741.2	770.2	395.6	216.7	156.0	44.3	66.9	1,894.1	1,827.3
as a percentage of GDP												
2022	100.0	98.4	52.6	21.5	22.7	11.6	6.3	4.7	1.7	1.6	-	-
Chain-linked volumes (prices for the previous year)												
quarter-on-quarter percentage changes												
2022 Q2	0.9	0.9	1.1	0.1	0.9	-0.2	1.7	2.6	-	-	1.8	1.9
Q3	0.4	1.6	0.9	-0.1	4.0	-0.9	3.2	17.1	-	-	1.7	4.2
Q4	0.0	-1.0	-0.9	0.8	-3.5	-0.9	-1.5	-11.5	-	-	0.0	-1.9
2023 Q1	0.1	.	.	.	.	.	.	.	-	-	.	.
annual percentage changes												
2020	-6.1	-5.8	-7.7	1.0	-6.2	-4.0	-11.8	-3.6	-	-	-9.0	-8.5
2021	5.4	4.2	3.7	4.3	3.9	6.4	9.3	-7.4	-	-	10.7	8.4
2022	3.5	3.8	4.3	1.4	3.7	2.1	4.1	7.1	-	-	7.0	8.0
2022 Q2	4.4	4.6	5.9	1.0	2.9	2.1	2.2	6.1	-	-	7.7	8.5
Q3	2.5	3.9	2.3	0.5	7.7	1.5	7.8	23.1	-	-	7.6	11.2
Q4	1.8	1.2	1.2	1.0	0.5	0.3	4.7	-3.8	-	-	4.9	3.6
2023 Q1	1.3	.	.	.	.	.	.	.	-	-	.	.
contributions to quarter-on-quarter percentage changes in GDP; percentage points												
2022 Q2	0.9	0.9	0.5	0.0	0.2	0.0	0.1	0.1	0.2	0.0	-	-
Q3	0.4	1.5	0.5	0.0	0.9	-0.1	0.2	0.8	0.2	-1.1	-	-
Q4	0.0	-1.0	-0.5	0.2	-0.8	-0.1	-0.1	-0.6	0.1	0.9	-	-
2023 Q1	0.1	.	.	.	.	.	.	.	.	.	-	-
contributions to annual percentage changes in GDP; percentage points												
2020	-6.1	-5.6	-4.1	0.2	-1.4	-0.4	-0.8	-0.2	-0.3	-0.5	-	-
2021	5.4	4.3	2.0	1.0	0.9	0.7	0.6	-0.4	0.3	1.4	-	-
2022	3.5	3.7	2.2	0.3	0.8	0.2	0.2	0.3	0.3	-0.2	-	-
2022 Q2	4.4	4.4	3.0	0.2	0.7	0.2	0.1	0.3	0.6	0.0	-	-
Q3	2.5	3.8	1.2	0.1	1.7	0.2	0.5	1.0	0.8	-1.3	-	-
Q4	1.8	1.1	0.6	0.2	0.1	0.0	0.3	-0.2	0.2	0.7	-	-
2023 Q1	1.3	.	.	.	.	.	.	.	.	.	-	-

Sources: Eurostat and ECB calculations.
Note: Euro area data include Croatia.
1) Exports and imports cover goods and services and include cross-border intra-euro area trade.
2) Including acquisitions less disposals of valuables.

2 Economic activity

2.2 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)											
2020	10,369.0	176.8	2,002.6	546.3	1,802.4	547.0	485.4	1,211.9	1,203.7	2,068.6	324.5	1,138.4
2021	11,092.1	190.0	2,177.8	596.6	2,005.6	589.5	497.6	1,247.6	1,290.2	2,161.1	336.2	1,283.9
2022	12,058.2	221.1	2,421.4	657.9	2,327.5	623.4	512.6	1,304.4	1,379.5	2,243.8	366.5	1,340.9
2022 Q1	2,914.7	51.3	584.5	159.5	551.4	151.8	124.3	317.2	337.4	550.2	87.1	340.4
Q2	2,980.7	54.1	602.5	163.0	576.4	155.3	125.7	320.5	342.8	549.8	90.7	340.9
Q3	3,036.1	56.9	604.1	165.3	594.7	156.0	128.2	326.5	346.8	563.9	93.6	334.1
Q4	3,111.9	58.4	634.8	168.8	603.1	159.1	133.8	335.1	352.6	573.2	93.0	329.4
	as a percentage of value added											
2022	100.0	1.8	20.1	5.5	19.3	5.2	4.3	10.8	11.4	18.6	3.0	-
	Chain-linked volumes (prices for the previous year)											
	quarter-on-quarter percentage changes											
2022 Q1	0.9	-1.0	0.7	2.0	1.0	0.5	-0.1	0.8	1.1	0.8	2.4	-2.0
Q2	0.8	-0.7	0.5	-0.7	2.0	2.1	0.3	0.3	0.8	-0.2	4.3	2.0
Q3	0.7	0.7	0.9	-1.1	1.1	0.2	-0.1	-0.1	0.3	1.5	2.9	-2.7
Q4	-0.3	-0.4	0.0	-0.5	-1.2	1.8	-0.5	0.3	0.1	-0.2	-2.8	1.9
	annual percentage changes											
2020	-6.0	0.0	-6.4	-5.7	-14.1	1.9	0.4	-0.9	-5.6	-2.7	-17.6	-7.0
2021	5.2	0.2	7.2	5.0	7.9	7.1	2.7	1.7	6.0	3.5	3.6	6.6
2022	3.6	-1.1	2.0	1.6	8.2	5.8	0.0	1.9	4.2	1.6	11.7	2.1
2022 Q1	5.4	-0.7	2.0	4.6	14.4	6.7	0.3	2.9	6.4	2.0	17.5	6.1
Q2	4.6	-1.7	2.2	1.9	11.8	6.9	0.5	2.2	5.0	1.2	16.5	3.1
Q3	2.7	-0.9	2.4	0.7	5.0	5.3	-0.1	1.4	3.2	1.3	7.0	0.3
Q4	2.1	-1.4	2.1	-0.4	2.9	4.7	-0.5	1.3	2.3	1.9	6.7	-0.7
	contributions to quarter-on-quarter percentage changes in value added; percentage points											
2022 Q1	0.9	0.0	0.1	0.1	0.2	0.0	0.0	0.1	0.1	0.2	0.1	-
Q2	0.8	0.0	0.1	0.0	0.4	0.1	0.0	0.0	0.1	0.0	0.1	-
Q3	0.7	0.0	0.2	-0.1	0.2	0.0	0.0	0.0	0.0	0.3	0.1	-
Q4	-0.3	0.0	0.0	0.0	-0.2	0.1	0.0	0.0	0.0	0.0	-0.1	-
	contributions to annual percentage changes in value added; percentage points											
2020	-6.0	0.0	-1.3	-0.3	-2.7	0.1	0.0	-0.1	-0.7	-0.5	-0.6	-
2021	5.2	0.0	1.5	0.3	1.4	0.4	0.1	0.2	0.7	0.7	0.1	-
2022	3.6	0.0	0.4	0.1	1.5	0.3	0.0	0.2	0.5	0.3	0.4	-
2022 Q1	5.4	0.0	0.4	0.2	2.5	0.4	0.0	0.3	0.7	0.4	0.5	-
Q2	4.6	0.0	0.4	0.1	2.1	0.4	0.0	0.3	0.6	0.2	0.5	-
Q3	2.7	0.0	0.5	0.0	0.9	0.3	0.0	0.2	0.4	0.3	0.2	-
Q4	2.1	0.0	0.4	0.0	0.5	0.3	0.0	0.1	0.3	0.4	0.2	-

Sources: Eurostat and ECB calculations.
Note: Euro area data include Croatia.

2 Economic activity

2.3 Employment [1]
(quarterly data seasonally adjusted; annual data unadjusted)

	Total	By employment status		By economic activity									
		Employ-ees	Self-employed	Agricul-ture, forestry and fishing	Manufac-turing, energy and utilities	Con-struc-tion	Trade, transport, accom-modation and food services	Infor-mation and com-munica-tion	Finance and insur-ance	Real estate	Professional, business and support services	Public adminis-tration, edu-cation, 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													
2020	100.0	85.9	14.1	3.0	14.5	6.2	24.4	3.0	2.4	1.0	13.9	24.9	6.6
2021	100.0	86.1	13.9	3.0	14.3	6.3	24.2	3.1	2.4	1.0	14.1	25.0	6.6
2022	100.0	86.3	13.7	2.9	14.1	6.3	24.4	3.2	2.3	1.0	14.2	24.8	6.6
annual percentage changes													
2020	-1.5	-1.6	-1.2	-2.4	-2.0	0.5	-3.9	1.8	0.0	-0.2	-2.2	1.0	-3.0
2021	1.4	1.6	0.1	0.0	-0.4	3.2	0.5	4.7	0.8	0.9	3.0	2.1	0.8
2022	2.3	2.5	0.9	-0.9	1.2	3.0	3.3	5.7	0.0	3.0	3.0	1.5	1.5
2022 Q1	3.1	3.4	1.3	-0.9	1.3	3.4	5.1	6.1	-0.2	2.2	4.4	1.8	2.9
Q2	2.7	3.0	0.8	-0.3	1.2	3.4	4.7	6.0	0.3	2.5	3.3	1.6	1.6
Q3	1.8	1.9	0.9	-1.1	1.4	3.1	1.9	6.2	-0.4	3.9	2.4	1.4	0.6
Q4	1.5	1.7	0.5	-1.2	1.0	2.1	1.7	4.5	0.3	3.4	2.0	1.3	0.9
Hours worked													
as a percentage of total hours worked													
2020	100.0	81.9	18.1	4.3	15.0	7.0	24.0	3.3	2.6	1.1	13.8	23.1	5.8
2021	100.0	81.7	18.3	4.1	14.9	7.2	24.3	3.4	2.5	1.1	14.0	22.7	5.8
2022	100.0	81.8	18.2	3.9	14.5	7.2	25.3	3.5	2.4	1.1	14.1	22.1	5.9
annual percentage changes													
2020	-8.1	-7.4	-11.1	-3.2	-7.5	-6.5	-14.8	-1.7	-2.4	-6.0	-8.3	-2.2	-12.0
2021	5.5	5.3	6.5	0.3	4.4	8.8	6.8	7.5	2.8	6.5	7.5	3.6	5.5
2022	3.4	3.6	2.8	-1.7	1.1	3.1	7.5	5.5	-0.6	4.9	4.1	0.7	6.1
2022 Q1	6.5	6.5	6.5	-2.0	2.0	4.7	16.1	6.3	-0.5	6.1	6.7	1.3	13.6
Q2	3.6	3.8	2.7	-1.9	0.3	2.7	9.8	5.1	-1.5	5.1	3.9	-0.2	6.9
Q3	2.5	2.9	1.0	-1.2	2.1	3.4	3.2	7.1	-0.3	5.0	3.8	1.3	2.5
Q4	2.2	2.3	2.0	-1.2	1.3	2.8	3.1	4.6	0.9	4.3	3.0	1.2	3.1
Hours worked per person employed													
annual percentage changes													
2020	-6.6	-5.8	-10.1	-0.8	-5.6	-7.0	-11.3	-3.5	-2.3	-5.9	-6.2	-3.1	-9.2
2021	4.0	3.6	6.4	0.3	4.8	5.5	6.3	2.7	2.0	5.5	4.4	1.5	4.6
2022	1.2	1.1	1.9	-0.8	-0.2	0.1	4.0	-0.2	-0.6	1.9	1.0	-0.8	4.6
2022 Q1	3.4	3.1	5.1	-1.1	0.7	1.2	10.4	0.3	-0.3	3.9	2.2	-0.5	10.4
Q2	0.9	0.8	1.9	-1.7	-0.9	-0.7	4.9	-0.9	-1.7	2.5	0.5	-1.7	5.1
Q3	0.7	0.9	0.1	-0.1	0.7	0.2	1.3	0.8	0.1	1.1	1.4	-0.2	1.9
Q4	0.7	0.6	1.5	0.0	0.3	0.8	1.3	0.0	0.6	0.9	1.0	-0.1	2.2

Sources: Eurostat and ECB calculations.
1) Data for employment are based on the ESA 2010.

2 Economic activity

2.4 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				
			Millions	% of labour force		Adult		Youth		Male		Female		
						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			80.1		19.9		51.3		48.7		
2020	162.757	3.5	12.964	8.0	3.0	10.380	7.0	2.584	18.2	6.644	7.6	6.320	8.3	1.8
2021	165.128	3.4	12.787	7.8	3.2	10.303	6.9	2.484	16.9	6.517	7.4	6.270	8.1	2.4
2022	167.907	3.1	11.340	6.8	2.7	9.082	6.0	2.258	14.6	5.687	6.4	5.653	7.2	3.1
2022 Q2	167.912	3.1	11.299	6.7	2.7	9.040	5.9	2.259	14.6	5.706	6.4	5.593	7.1	3.2
Q3	168.052	3.0	11.427	6.8	2.5	9.054	5.9	2.373	15.2	5.743	6.4	5.684	7.2	3.1
Q4	168.605	3.0	11.222	6.7	2.5	8.967	5.9	2.255	14.3	5.592	6.2	5.630	7.1	3.1
2023 Q1	.	.	.	6.6	.	.	5.8	.	14.4	.	6.1	.	7.0	.
2022 Oct.	-	-	11.198	6.7	-	8.930	5.8	2.267	14.5	5.593	6.2	5.605	7.1	-
Nov.	-	-	11.257	6.7	-	8.975	5.9	2.281	14.5	5.632	6.3	5.625	7.1	-
Dec.	-	-	11.246	6.7	-	8.989	5.9	2.257	14.3	5.606	6.2	5.640	7.1	-
2023 Jan.	-	-	11.176	6.6	-	8.899	5.8	2.276	14.4	5.553	6.2	5.623	7.1	-
Feb.	-	-	11.131	6.6	-	8.853	5.8	2.278	14.4	5.533	6.1	5.599	7.1	-
Mar.	-	-	11.010	6.5	-	8.746	5.7	2.264	14.3	5.481	6.1	5.529	7.0	-

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).

2.5 Short-term business statistics

| | Industrial production | | | | | | Con-struction produc-tion | Retail sales | | | | Services production [1] | 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	40.4	52.5	7.1	100.0	100.0
						annual percentage changes							
2020	-7.6	-8.2	-7.2	-11.2	-4.2	-4.4	-5.3	-0.8	3.7	-2.2	-14.4	-9.8	-25.1
2021	8.9	9.8	9.6	11.7	8.1	1.4	5.9	5.1	0.9	7.8	9.6	8.0	-3.1
2022	2.2	3.0	-1.3	5.4	5.4	-3.5	2.4	0.7	-2.8	2.5	6.7	10.0	-4.1
2022 Q1	1.6	2.1	1.1	0.3	6.5	-1.5	6.0	5.7	-1.7	11.1	12.6	12.3	-13.0
Q2	2.0	2.6	-0.2	4.5	3.2	-1.4	2.7	1.0	-2.8	2.9	7.9	13.3	-16.3
Q3	3.3	3.9	-1.8	9.8	3.0	-1.4	0.9	-0.6	-1.6	-0.7	3.7	9.1	2.2
Q4	2.1	3.4	-4.4	7.1	8.7	-9.1	0.4	-2.6	-5.0	-1.6	3.7	6.3	16.3
2022 Oct.	4.2	5.5	-3.2	11.5	9.3	-8.5	0.7	-2.6	-3.9	-2.2	2.4	7.2	14.9
Nov.	3.6	5.4	-3.5	10.8	9.7	-11.4	1.4	-2.4	-4.5	-2.0	4.2	6.3	17.9
Dec.	-2.1	-1.1	-7.0	-1.4	7.0	-7.5	-0.6	-2.8	-6.5	-0.8	4.6	5.5	16.1
2023 Jan.	0.9	2.2	-5.4	8.2	3.3	-7.2	0.5	-1.8	-4.8	-0.2	6.2	7.5	.
Feb.	2.0	2.7	-4.9	10.4	2.5	-3.3	2.3	-3.0	-4.9	-1.8	1.1	.	.
Mar.	.	.	.	.	.	.	.	.	.	.	.	.	.
						month-on-month percentage changes (s.a.)							
2022 Oct.	-1.7	-1.6	-1.4	0.2	-0.2	-4.4	0.9	-1.5	-1.3	-2.0	-0.1	-	-0.2
Nov.	1.3	1.6	0.5	0.5	1.6	-1.3	0.3	0.6	-0.5	1.6	0.9	-	3.4
Dec.	-1.4	-1.6	-2.8	-0.2	-1.1	3.3	-2.5	-1.5	-1.8	-2.3	0.6	-	3.7
2023 Jan.	1.0	0.0	1.5	0.1	-2.2	-0.2	3.8	0.8	1.8	0.9	-0.9	-	-8.0
Feb.	1.5	1.3	1.1	2.2	1.7	1.1	2.3	-0.8	-0.6	-0.7	-1.8	-	3.2
Mar.	.	.	.	.	.	.	.	.	.	.	.	-	-0.9

Sources: Eurostat, ECB calculations and European Automobile Manufacturers Association (col. 13).
1) Excluding trade and financial services.

2 Economic activity

2.6 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 confid-ence indicator	Service industries		Purchasing Managers' Index (PMI) for manu-facturing	Manu-facturing output	Business activity for services	Composite output
		Industrial confidence indicator	Capacity utilisation (%)				Services confidence indicator	Capacity utilisation (%)				
	1	2	3	4	5	6	7	8	9	10	11	12
1999-15	98.7	-5.2	80.6	-11.7	-15.4	-8.6	7.3	-	51.2	52.5	53.0	52.8
2020	88.0	-13.2	74.3	-14.2	-7.0	-12.6	-15.9	86.3	48.6	48.0	42.5	44.0
2021	110.7	9.4	81.8	-7.5	4.2	-1.8	8.3	87.7	60.2	58.3	53.6	54.9
2022	101.8	4.8	82.0	-21.9	5.2	-3.8	9.3	90.1	52.1	49.3	52.1	51.4
2022 Q2	103.9	6.7	82.4	-22.7	5.4	-5.1	12.4	90.3	54.1	50.4	55.6	54.2
Q3	97.0	1.7	81.9	-27.0	2.8	-6.9	7.2	90.8	49.3	46.3	49.9	49.0
Q4	95.3	-0.9	81.2	-24.4	3.1	-4.8	5.0	90.4	47.1	45.9	49.0	48.2
2023 Q1	99.5	0.2	81.1	-19.6	1.3	-0.8	9.9	90.1	48.2	49.8	52.8	52.0
2022 Nov.	95.1	-1.4	-	-23.7	2.7	-5.8	4.1	-	47.1	46.0	48.5	47.8
Dec.	97.0	-0.8	-	-22.0	3.6	-2.7	7.6	-	47.8	47.8	49.8	49.3
2023 Jan.	99.7	0.9	81.0	-20.6	1.3	-0.7	10.5	90.2	48.8	48.9	50.8	50.3
Feb.	99.6	0.3	-	-19.0	1.6	-0.2	9.6	-	48.5	50.1	52.7	52.0
Mar.	99.2	-0.5	-	-19.1	1.0	-1.5	9.6	-	47.3	50.4	55.0	53.7
Apr.	99.3	-2.6	81.2	-17.5	1.0	-1.0	10.5	90.0	45.8	48.5	56.6	54.4

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

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

	Households							Non-financial corporations					
	Saving rate (gross)	Debt ratio	Real gross disposable income	Financial investment	Non-financial investment (gross)	Net worth [2]	Hous-ing wealth	Profit rate [3]	Saving rate (gross)	Debt ratio [4]	Financial investment	Non-financial investment (gross)	Finan-cing
	Percentage of gross disposable income (adjusted) [1]		Annual percentage changes					Percentage of gross value added		Percent-age of GDP	Annual percentage changes		
	1	2	3	4	5	6	7	8	9	10	11	12	13
2019	13.2	93.1	2.0	2.6	3.9	6.6	4.6	47.7	24.2	74.4	2.1	7.7	1.9
2020	19.7	95.5	-0.1	4.1	-2.6	5.5	4.8	46.2	24.7	81.3	3.5	-12.2	2.4
2021	17.7	95.8	1.5	3.7	18.2	8.0	8.4	49.1	26.3	79.0	4.9	8.0	3.1
2022 Q1	16.1	95.6	0.4	3.0	18.3	6.4	9.8	49.0	26.0	77.9	4.6	15.1	3.0
Q2	14.9	95.3	0.3	2.7	16.8	4.0	10.2	49.1	24.5	76.6	4.5	-5.5	3.1
Q3	14.4	94.6	-0.3	2.7	11.1	2.6	9.2	49.3	24.0	76.6	4.4	29.8	3.2
Q4	14.0	93.1	-0.6	2.5	5.9	1.2	6.8	49.1	23.8	74.7	3.1	5.5	2.1

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 rate is gross entrepreneurial income (broadly equivalent to cash flow) divided by gross value added.
4) Defined as consolidated loans and debt securities liabilities.

2 Economic activity

2.8 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
2022 Q1	1,224.8	1,224.3	0.5	683.1	683.6	296.4	258.3	208.9	209.8	36.4	72.7	28.2	20.2
Q2	1,276.5	1,317.5	-41.0	717.0	747.3	306.5	270.6	212.5	215.4	40.5	84.2	116.2	11.7
Q3	1,327.7	1,420.6	-92.9	752.5	804.2	312.0	310.4	223.4	220.8	39.8	85.1	20.2	16.6
Q4	1,354.1	1,370.0	-15.8	745.8	750.6	310.4	268.0	255.7	268.9	42.3	82.5	55.8	35.5
2022 Sep.	448.4	478.7	-30.3	254.9	266.0	104.5	110.5	75.6	75.1	13.4	27.2	7.5	6.0
Oct.	454.1	468.3	-14.2	249.8	259.4	105.0	91.0	85.2	91.1	14.2	26.8	10.0	4.8
Nov.	456.7	459.3	-2.6	254.2	251.5	104.6	89.4	83.6	90.1	14.2	28.3	7.6	4.9
Dec.	443.3	442.4	0.9	241.8	239.7	100.8	87.6	86.9	87.7	13.9	27.4	38.2	25.8
2023 Jan.	460.4	441.7	18.6	256.7	243.1	108.9	95.0	80.5	79.9	14.2	23.7	11.7	13.3
Feb.	454.0	429.7	24.3	256.9	228.4	108.2	96.2	75.7	80.2	13.2	24.9	7.5	4.2
	12-month cumulated transactions												
2023 Feb.	5,280.3	5,394.5	-114.1	2,955.3	3,006.5	1,245.5	1,127.6	916.4	936.4	163.1	324.0	224.2	91.2
	12-month cumulated transactions as a percentage of GDP												
2023 Feb.	39.4	40.3	-0.9	22.1	22.5	9.3	8.4	6.8	7.0	1.2	2.4	1.7	0.7

1) The capital account is not seasonally adjusted.

2.9 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	Manu-facturing		Intermediate goods	Capital goods	Consumption goods	Manu-facturing	Oil
	1	2	3	4	5	6	7	8	9	10	11	12	13
	Values (EUR billions; annual percentage changes for columns 1 and 2)												
2022 Q1	17.0	40.8	676.2	342.6	124.7	196.4	555.2	726.2	451.5	105.2	152.6	484.0	82.8
Q2	20.3	45.5	716.8	360.0	126.8	217.4	575.5	810.7	510.2	111.7	164.0	517.5	108.2
Q3	20.2	47.6	731.9	368.2	134.1	218.3	588.3	854.9	540.5	116.8	168.7	532.5	108.3
Q4	14.9	20.3	741.7	363.6	141.0	223.2	602.9	797.8	487.8	113.5	169.7	517.5	97.5
2022 Sep.	23.8	45.3	249.7	125.1	45.9	74.5	203.0	285.3	178.9	39.8	56.9	178.5	32.9
Oct.	18.2	31.4	246.5	122.8	45.5	73.4	201.7	275.0	166.7	39.5	57.7	177.4	34.2
Nov.	17.5	20.9	251.2	123.4	48.6	74.6	205.2	265.6	161.1	38.7	56.5	174.0	32.4
Dec.	9.0	9.1	244.0	117.4	46.9	75.2	196.0	257.1	160.0	35.3	55.4	166.0	30.9
2023 Jan.	10.8	10.0	241.0	115.3	45.0	75.3	194.8	252.6	149.0	39.0	53.5	169.1	29.9
Feb.	7.7	1.1	243.9	.	.	.	243.9	.	.	.	.	.	.
	Volume indices (2000 = 100; annual percentage changes for columns 1 and 2)												
2022 Q1	2.4	10.5	106.1	106.9	103.5	111.7	105.9	117.0	117.1	119.5	117.3	119.4	131.5
Q2	2.2	11.5	106.7	105.9	101.9	117.3	106.1	121.6	121.8	124.6	120.6	123.2	143.6
Q3	2.8	14.8	106.5	104.8	106.1	114.5	106.3	123.9	121.6	124.8	120.9	123.1	141.1
Q4	1.5	2.9	107.2	104.1	109.5	114.6	106.9	119.1	115.9	119.7	121.4	120.3	145.6
2022 Aug.	6.1	19.1	107.1	105.0	106.8	114.9	107.3	126.2	122.6	129.9	122.7	126.1	139.4
Sep.	6.5	14.2	108.7	106.4	108.2	117.0	109.1	123.2	120.5	125.5	121.7	122.9	140.2
Oct.	2.9	9.9	107.7	106.1	107.8	114.0	107.2	122.2	118.1	124.8	123.2	123.4	147.5
Nov.	2.7	4.2	108.4	105.2	113.1	114.0	108.3	119.6	115.8	121.5	121.2	121.2	140.0
Dec.	-1.2	-5.2	105.6	101.0	107.6	115.8	105.2	115.5	113.9	112.8	120.0	116.5	149.4
2023 Jan.	2.8	3.7	106.1	101.8	103.4	117.1	104.8	117.3	114.2	121.7	116.8	118.0	150.7

Sources: ECB and Eurostat.
1) Differences between ECB's b.o.p. goods (Table 2.8) and Eurostat's trade in goods (Table 2.9) are mainly due to different definitions.
2) Product groups as classified in the Broad Economic Categories.

3 Prices and costs

3.1 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	Total excluding food and energy	Goods	Services	Total	Processed food	Unpro-cessed food	Non-energy industrial goods	Energy (n.s.a.)	Services	Total HICP excluding administered prices	Admini-stered prices
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
2020 105.1	0.3	0.7	-0.4	1.0	-	-	-	-	-	-	0.2	0.6
2021 107.8	2.6	1.5	3.4	1.5	-	-	-	-	-	-	2.5	3.1
2022 116.8	8.4	3.9	11.9	3.5	-	-	-	-	-	-	8.5	7.8
2022 Q2 116.1	8.0	3.7	11.4	3.4	2.4	3.5	4.5	1.4	7.1	1.1	8.2	7.1
Q3 118.1	9.3	4.4	13.2	3.9	2.2	4.0	2.7	1.8	4.4	1.1	9.5	7.8
Q4 120.8	10.0	5.1	14.0	4.3	2.3	3.7	2.9	1.4	4.6	1.4	10.0	9.5
2023 Q1 121.3	8.0	5.5	10.3	4.7	0.8	3.4	2.7	1.8	-6.0	1.2	8.1	7.3
2022 Nov. 121.0	10.1	5.0	14.2	4.2	0.2	1.3	-0.2	0.4	-1.9	0.4	10.2	9.1
Dec. 120.5	9.2	5.2	12.6	4.4	-0.4	1.2	-0.6	0.6	-6.6	0.3	9.3	8.4
2023 Jan. 120.3	8.6	5.3	11.7	4.4	0.6	1.1	0.3	0.8	0.6	0.3	8.7	8.2
Feb. 121.2	8.5	5.6	11.1	4.8	0.6	1.1	3.1	0.6	-1.1	0.6	8.6	7.8
Mar. 122.3	6.9	5.7	8.1	5.1	0.3	0.9	2.3	0.3	-2.2	0.4	7.0	5.9
Apr. [3)] 123.2	7.0	5.6	.	5.2	0.3	0.5	-1.6	0.2	-0.8	0.8	.	.

	Goods						Services					
	Food (including alcoholic beverages and tobacco)			Industrial goods			Housing		Transport	Communi-cation	Recreation and personal care	Miscel-laneous
	Total	Processed food	Unpro-cessed 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
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
2021	1.5	1.5	1.6	4.5	1.5	13.0	1.4	1.2	2.1	0.3	1.5	1.6
2022	9.0	8.6	10.4	13.6	4.6	37.0	2.4	1.7	4.4	-0.2	6.1	2.1
2022 Q2	7.6	6.9	9.8	13.7	4.1	39.6	2.2	1.4	4.5	0.1	5.9	1.7
Q3	10.7	10.5	11.6	14.7	5.0	39.7	2.6	1.9	4.3	-0.2	7.2	2.1
Q4	13.5	13.4	13.7	14.2	6.2	33.9	3.0	2.1	5.6	-0.7	7.1	2.8
2023 Q1	14.9	15.4	13.3	7.8	6.7	10.0	3.6	2.5	5.8	0.2	7.2	3.8
2022 Nov.	13.6	13.6	13.8	14.5	6.1	34.9	3.0	2.2	5.6	-0.7	6.9	2.8
Dec.	13.8	14.3	12.0	12.0	6.4	25.5	3.1	2.3	5.4	-0.6	7.2	3.0
2023 Jan.	14.1	15.0	11.3	10.4	6.7	18.9	3.4	2.3	5.4	0.2	6.5	3.7
Feb.	15.0	15.4	13.9	8.9	6.8	13.7	3.6	2.6	6.0	0.2	7.3	3.8
Mar.	15.5	15.7	14.7	4.3	6.6	-0.9	3.7	2.7	5.9	0.3	7.8	3.9
Apr. [3)]	13.6	14.7	10.0	.	6.2	2.5	.	.	.	.	.	.

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).
3) Flash estimate.

3 Prices and costs

3.2 Industry, construction and property prices
(annual percentage changes, unless otherwise indicated)

	Industrial producer prices excluding construction [1]										Construction [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	16.6	5.9	27.9			
2020	102.0	-2.6	-1.7	-0.1	-1.6	0.9	0.9	1.1	0.6	-9.7	1.7	5.3	1.6
2021	114.5	12.3	7.4	5.8	10.9	2.5	2.1	3.3	1.8	32.2	5.6	8.1	0.8
2022	153.8	34.3	16.9	14.1	20.3	7.2	12.1	16.4	7.7	85.2	11.5	7.0	.
2022 Q1	140.9	33.1	15.4	12.7	21.4	6.1	7.4	10.0	5.5	92.4	10.1	9.8	3.4
Q2	149.2	36.5	20.0	15.8	24.8	7.4	11.6	16.3	7.5	95.4	12.5	9.2	-0.1
Q3	163.1	41.1	17.7	14.7	20.2	7.7	14.0	19.0	8.6	107.8	11.9	6.6	-2.0
Q4	161.9	27.2	14.5	13.1	15.4	7.6	15.3	19.9	9.3	56.0	11.6	2.9	.
2022 Sep.	167.5	41.8	17.0	14.4	19.0	7.6	14.6	19.6	8.9	107.9	-	-	-
Oct.	162.4	30.4	16.2	14.0	17.4	7.6	15.3	20.4	9.3	64.9	-	-	-
Nov.	160.8	26.9	14.4	13.1	15.2	7.6	15.4	20.1	9.3	55.5	-	-	-
Dec.	162.6	24.5	13.0	12.4	13.6	7.5	15.0	19.3	9.4	48.5	-	-	-
2023 Jan.	158.1	15.1	11.6	11.1	11.2	7.3	14.7	18.8	8.8	20.7	-	-	-
Feb.	157.3	13.2	9.8	10.2	9.3	7.3	14.5	18.2	8.6	17.4	-	-	-

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).

3.3 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 consumption	Government consumption	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
2020	107.3	1.8	1.3	0.6	3.4	1.0	-1.4	-2.7	37.0	1.4	3.3	-0.3	-1.0	-0.3	-1.8
2021	109.4	2.0	2.8	2.2	1.5	3.7	5.8	7.9	59.8	.	.	37.2	.	.	37.1
2022	114.5	4.6	6.8	6.9	4.1	7.6	12.5	17.5	95.0	.	.	9.0	.	.	9.9
2022 Q2	113.6	4.5	6.9	6.4	3.6	8.3	14.7	20.6	106.1	22.5	39.7	9.2	24.2	38.2	10.8
Q3	114.9	4.6	7.4	7.6	4.6	7.5	13.5	19.6	98.3	.	.	1.5	.	.	2.3
Q4	117.4	5.8	7.1	8.8	5.6	7.5	9.7	12.6	86.6	.	.	-2.3	.	.	-3.1
2023 Q1	.	.	.	.	.	.	.	.	75.8	-9.9	-4.0	-15.1	-10.3	-4.6	-16.4
2022 Nov.	-	-	-	-	-	-	-	-	89.3	6.3	12.5	0.5	5.9	11.1	0.0
Dec.	-	-	-	-	-	-	-	-	76.4	0.0	6.4	-5.6	-1.3	4.0	-7.0
2023 Jan.	-	-	-	-	-	-	-	-	77.1	-4.1	1.4	-8.9	-5.2	-0.2	-10.4
Feb.	-	-	-	-	-	-	-	-	77.3	-7.5	-0.9	-13.4	-7.9	-1.5	-14.7
Mar.	-	-	-	-	-	-	-	-	73.3	-17.1	-11.5	-22.1	-16.9	-11.1	-23.2
Apr.	-	-	-	-	-	-	-	-	76.7	.	.	.	.	.	.

Sources: Eurostat, ECB calculations and Bloomberg (col. 9).
Note: Euro area data include Croatia.
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.

3 Prices and costs

3.4 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	Input prices		Prices charged	
	Manu-facturing	Retail trade	Services	Construction	12 months	Manu-facturing	Services	Manu-facturing	Services
	1	2	3	4	5	6	7	8	9
1999-15	4.3	5.7	-	-4.4	32.4	56.7	56.3	-	49.7
2020	-0.3	1.9	-0.6	-5.1	11.5	49.0	52.1	48.7	47.2
2021	31.6	24.0	10.3	19.7	30.4	84.0	61.9	66.8	53.4
2022	48.4	52.9	27.2	42.5	71.6	77.1	75.4	69.6	62.0
2022 Q2	56.4	57.0	29.1	48.9	71.7	84.0	78.0	74.8	64.4
Q3	46.0	54.0	27.4	40.7	76.5	74.3	74.9	67.1	61.8
Q4	40.2	51.6	29.0	41.7	78.1	65.8	74.3	63.7	62.0
2023 Q1	24.0	44.2	26.3	27.3	78.4	51.3	69.9	57.8	61.2
2022 Nov.	39.5	50.6	29.3	43.0	78.4	64.5	74.3	63.6	62.3
Dec.	36.9	48.7	27.9	37.3	78.6	61.0	71.8	61.2	61.0
2023 Jan.	30.8	46.2	28.7	34.2	78.0	56.3	70.1	61.6	62.0
Feb.	23.1	44.0	26.2	26.0	78.6	50.9	71.0	58.4	61.8
Mar.	18.1	42.2	24.0	21.6	78.6	46.8	68.5	53.4	59.8
Apr.	12.0	35.6	20.2	15.6	78.3	44.0	67.6	51.6	58.2

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

3.5 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	
2020	110.7	3.4	4.0	1.4	2.8	4.6	1.8
2021	112.1	1.2	1.4	0.9	1.1	1.5	1.5
2022	117.1	4.5	3.7	6.8	4.8	3.7	2.8
2022 Q1	108.5	3.7	2.7	7.3	4.4	2.4	2.9
Q2	120.2	4.7	4.1	6.4	5.3	3.2	2.5
Q3	113.4	3.8	3.0	5.9	3.8	3.4	2.9
Q4	126.3	5.7	5.1	7.6	5.7	5.6	2.9

Sources: Eurostat and ECB calculations.
1) Experimental data based on non-harmonised sources (see https://www.ecb.europa.eu/stats/ecb_statistics/governance_and_quality_framework/html/experimental-data.en.html for further details).

3 Prices and costs

3.6 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								
2020	110.3	4.6	-1.0	2.7	5.6	7.4	0.3	-0.2	1.4	4.0	6.2	16.0
2021	110.3	0.0	3.3	-3.1	2.8	-1.5	2.0	1.2	4.3	1.2	0.5	0.6
2022	113.9	3.2	4.2	2.8	5.2	1.5	3.0	3.8	5.5	4.3	3.6	-3.4
2022 Q1	112.4	2.0	3.5	3.7	3.1	-1.1	2.5	3.3	4.7	2.6	2.4	-5.3
Q2	112.7	2.9	5.5	3.2	5.0	1.0	1.8	4.5	5.0	4.1	3.1	-6.8
Q3	114.1	3.2	3.5	1.6	5.6	1.6	4.1	3.7	7.1	4.2	3.7	-0.9
Q4	116.3	4.6	4.7	2.3	7.0	4.3	3.7	3.7	5.1	6.2	4.9	-1.0
				Compensation per employee								
2020	107.2	-0.2	1.5	-2.0	-0.9	-4.0	0.5	0.3	0.6	0.3	2.3	-1.4
2021	111.4	3.9	3.2	4.3	4.5	5.8	4.5	3.1	5.2	4.2	2.0	3.5
2022	116.3	4.5	3.9	3.6	3.7	6.3	3.2	3.9	4.4	5.5	3.7	6.2
2022 Q1	114.4	4.4	3.5	4.3	4.1	7.7	3.2	4.0	5.4	4.7	2.7	8.1
Q2	115.3	4.6	4.0	4.2	3.6	7.8	2.7	4.7	4.7	5.8	2.8	6.9
Q3	116.8	3.9	3.6	2.7	3.2	4.6	3.2	3.9	4.7	5.1	3.6	5.4
Q4	118.7	5.0	4.4	3.5	4.4	5.5	3.8	2.9	3.0	6.5	5.5	4.7
				Labour productivity per person employed								
2020	97.2	-4.6	2.5	-4.5	-6.2	-10.6	0.2	0.4	-0.8	-3.5	-3.7	-15.0
2021	101.0	3.9	0.0	7.6	1.7	7.4	2.5	1.9	0.8	3.0	1.4	2.8
2022	102.2	1.2	-0.4	0.8	-1.4	4.7	0.2	0.0	-1.0	1.1	0.1	10.0
2022 Q1	101.8	2.4	0.0	0.6	1.0	8.8	0.7	0.7	0.7	2.0	0.2	14.2
Q2	102.3	1.7	-1.4	1.0	-1.4	6.8	0.9	0.2	-0.3	1.7	-0.3	14.7
Q3	102.4	0.7	0.1	1.1	-2.3	3.0	-0.9	0.2	-2.3	0.8	-0.1	6.4
Q4	102.1	0.3	-0.2	1.2	-2.4	1.1	0.1	-0.8	-2.0	0.3	0.6	5.8
				Compensation per hour worked								
2020	113.9	5.9	3.9	3.3	5.3	6.9	3.4	2.2	5.6	6.2	5.2	6.4
2021	114.3	0.3	1.2	-0.1	-0.3	0.2	1.9	1.3	0.8	0.4	0.8	-0.3
2022	118.2	3.4	4.6	3.9	3.9	1.9	3.6	4.4	3.5	4.3	4.6	2.6
2022 Q1	116.5	1.3	3.8	3.9	3.2	-2.3	3.0	4.3	2.9	2.2	3.3	-0.3
Q2	116.9	3.8	5.7	5.0	5.4	2.2	4.0	6.3	3.7	5.1	4.7	2.8
Q3	118.8	3.0	3.6	2.1	2.9	2.5	2.7	3.4	4.1	3.3	3.8	4.1
Q4	120.8	4.4	5.3	3.1	3.3	4.1	4.1	2.7	2.3	5.6	5.8	3.0
				Hourly labour productivity								
2020	104.6	2.0	3.2	1.1	0.8	0.6	3.9	2.9	5.4	2.9	-0.6	-6.5
2021	104.6	-0.1	-0.3	2.7	-3.6	1.2	-0.2	-0.2	-4.5	-1.3	0.0	-1.6
2022	104.6	0.0	0.5	1.0	-1.5	0.7	0.4	0.6	-2.8	0.1	0.9	5.2
2022 Q1	104.3	-0.9	1.1	-0.1	-0.3	-1.3	0.4	0.9	-3.1	-0.2	0.7	3.6
Q2	104.6	0.8	0.2	1.8	-0.7	1.9	1.9	2.0	-2.7	1.1	1.4	9.1
Q3	105.1	-0.1	0.2	0.5	-2.5	1.7	-1.6	0.1	-3.3	-0.5	0.1	4.4
Q4	104.6	-0.4	-0.2	0.8	-3.1	-0.2	0.1	-1.3	-2.9	-0.7	0.7	3.5

Sources: Eurostat and ECB calculations.
Note: Euro area data include Croatia.

4 Financial market developments

4.1 Money market interest rates
(percentages per annum; period averages)

	Euro area [1]					United States	Japan
	Euro short-term rate (€STR)[2]	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
2020	-0.55	-0.50	-0.43	-0.37	-0.31	0.64	-0.07
2021	-0.57	-0.56	-0.55	-0.52	-0.49	0.16	-0.08
2022	-0.01	0.09	0.35	0.68	1.10	2.40	-0.02
2022 Oct.	0.66	0.92	1.43	2.00	2.63	4.14	-0.03
Nov.	1.37	1.42	1.83	2.32	2.83	4.65	-0.04
Dec.	1.57	1.72	2.06	2.56	3.02	4.74	-0.04
2023 Jan.	1.90	1.98	2.34	2.86	3.34	4.81	-
Feb.	2.27	2.37	2.64	3.14	3.53	4.89	-
Mar.	2.57	2.71	2.91	3.27	3.65	5.05	-
Apr.	2.90	2.95	3.17	3.50	3.74	5.25	-

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.

4.2 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
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	-0.73	-0.72	-0.68	-0.48	-0.19	0.53	1.12	0.45	-0.69	-0.58	-0.12	0.24
2022	1.71	2.46	2.57	2.45	2.56	0.09	-0.84	-0.24	2.85	2.48	2.47	2.76
2022 Oct.	1.08	1.93	1.92	1.98	2.24	0.31	-0.63	0.51	2.16	1.77	2.32	2.54
Nov.	1.46	2.02	2.04	1.96	1.99	-0.03	-1.13	-0.04	2.23	1.91	1.99	2.01
Dec.	1.71	2.46	2.57	2.45	2.56	0.09	-0.84	-0.24	2.85	2.48	2.47	2.76
2023 Jan.	2.22	2.67	2.51	2.29	2.32	-0.35	-1.18	-0.12	2.65	2.15	2.24	2.41
Feb.	2.66	3.16	3.08	2.80	2.76	-0.40	-1.10	-0.26	3.28	2.77	2.63	2.77
Mar.	2.75	2.80	2.62	2.35	2.41	-0.39	-1.16	-0.52	2.67	2.25	2.27	2.58
Apr.	2.88	2.94	2.68	2.37	2.44	-0.50	-1.36	-0.60	2.74	2.20	2.30	2.65

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.

4.3 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
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	448.3	4,023.6	962.9	289.8	183.0	95.4	164.4	819.0	874.3	377.7	279.6	886.3	4,277.6	28,836.5
2022 Oct.	378.5	3,464.6	875.2	233.5	158.0	108.5	149.5	666.2	656.6	315.8	258.3	738.9	3,726.1	26,983.2
Nov.	414.2	3,840.0	958.6	253.4	165.1	119.8	165.4	733.5	745.1	346.5	274.1	781.3	3,917.5	27,903.3
Dec.	418.3	3,884.7	944.2	257.4	166.8	121.0	168.9	738.0	757.3	355.1	268.3	786.9	3,912.4	27,214.7
2023 Jan.	439.8	4,092.7	963.0	276.9	167.7	123.3	182.3	780.4	807.6	358.7	277.9	808.6	3,960.7	26,606.3
Feb.	455.8	4,238.1	983.5	291.6	170.5	122.4	192.5	814.0	849.1	357.3	288.7	817.0	4,079.7	27,509.1
Mar.	448.5	4,201.7	968.8	292.2	175.7	116.6	182.1	809.6	834.4	358.9	296.7	797.0	3,968.6	27,693.2
Apr.	460.9	4,358.3	990.6	305.7	184.2	120.7	183.3	817.9	843.4	383.5	305.9	843.0	4,121.5	28,275.8

Source: Refinitiv.

4 Financial market developments

4.4 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					Composite cost-of-borrowing indicator
	Over-night	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]	
			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
2022 Mar.	0.01	0.46	0.19	0.52	4.81	15.76	5.45	5.24	5.81	2.08	1.40	1.53	1.54	1.47	1.75	1.47
Apr.	0.01	0.46	0.20	0.56	4.75	15.78	5.82	5.39	5.97	2.24	1.43	1.72	1.77	1.58	1.89	1.61
May	0.00	0.45	0.20	0.64	4.80	15.85	5.88	5.58	6.20	2.48	1.52	1.87	2.02	1.74	2.06	1.78
June	0.00	0.45	0.22	0.71	4.80	15.87	5.70	5.56	6.16	2.51	1.69	2.06	2.28	1.87	2.21	1.97
July	0.01	0.46	0.30	0.88	4.84	15.86	6.18	5.75	6.36	2.81	1.84	2.27	2.54	1.99	2.36	2.15
Aug.	0.01	0.70	0.40	1.02	4.97	15.89	6.68	5.92	6.51	2.96	2.07	2.44	2.63	2.08	2.49	2.26
Sep.	0.02	0.71	0.60	1.27	5.27	15.83	6.57	5.96	6.58	3.09	2.27	2.59	2.84	2.25	2.67	2.45
Oct.	0.03	0.73	0.90	1.60	5.58	15.97	6.83	6.21	6.87	3.55	2.66	2.82	3.05	2.41	2.90	2.67
Nov.	0.05	0.75	1.19	1.81	5.81	15.98	6.43	6.55	7.13	3.96	2.93	3.04	3.30	2.55	3.11	2.89
Dec.	0.07	0.80	1.41	1.91	5.95	15.90	6.66	6.42	7.00	3.99	3.07	3.16	3.29	2.61	3.18	2.94
2023 Jan.	0.10	0.86	1.58	2.08	6.34	15.98	7.44	6.97	7.61	4.28	3.46	3.31	3.39	2.77	3.39	3.10
Feb. (p)	0.12	1.17	1.88	2.21	6.59	16.06	7.44	7.07	7.80	4.57	3.66	3.47	3.52	2.94	3.55	3.24

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).

4.5 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
	Over-night	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
2022 Mar.	-0.06	-0.30	0.64	1.69	1.77	1.96	2.11	1.50	1.45	1.52	1.25	1.17	1.54	1.49
Apr.	-0.05	-0.30	0.44	1.67	1.88	1.98	2.24	1.52	1.45	1.67	1.19	1.12	1.57	1.51
May	-0.06	-0.27	0.52	1.67	1.81	2.02	2.40	1.52	1.49	1.79	1.15	1.22	1.95	1.55
June	-0.05	-0.14	1.05	1.72	1.83	2.18	2.56	1.60	1.56	1.94	1.81	1.55	2.14	1.83
July	0.00	0.04	1.20	1.78	1.90	2.44	2.78	1.69	1.86	2.14	1.40	1.77	2.11	1.79
Aug.	0.01	0.15	1.61	1.86	2.08	2.49	2.94	1.86	2.13	2.30	1.55	1.88	2.22	1.87
Sep.	0.05	0.70	1.79	2.23	2.48	2.91	3.24	2.31	2.55	2.45	2.31	2.34	2.38	2.40
Oct.	0.08	0.92	1.83	2.54	2.96	3.52	3.62	2.74	3.02	2.75	2.45	2.76	2.82	2.72
Nov.	0.15	1.49	2.34	2.90	3.33	3.75	4.01	3.12	3.37	3.06	2.88	3.30	3.29	3.10
Dec.	0.19	1.80	2.61	3.21	3.73	3.99	4.19	3.46	3.55	3.27	3.29	3.58	3.29	3.41
2023 Jan.	0.23	1.99	2.71	3.58	4.13	4.20	4.38	3.77	3.92	3.45	3.41	3.75	3.39	3.63
Feb. (p)	0.31	2.29	2.80	3.82	4.39	4.35	4.64	4.05	4.09	3.69	3.68	3.54	3.58	3.85

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.

4.6 Debt securities issued by euro area residents, by sector of the issuer and original maturity
(EUR billions; transactions during the month and end-of-period outstanding amounts; market values)

	Outstanding amounts							Gross issues [1]						
	Total	MFIs	Non-MFI corporations			General government		Total	MFIs	Non-MFI corporations			General government	
			Financial corporations other than MFIs	FVCs	Non-financial corporations		of which central government			Financial corporations other than MFIs	FVCs	Non-financial corporations		of which central government
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
					Short-term									
2020	1,489.1	429.8	126.9	52.5	96.4	836.1	722.5	.	.	.	.	.	.	.
2021	1,412.4	427.9	132.0	50.0	87.7	764.7	674.9	387.3	138.4	79.5	26.4	31.8	137.6	104.8
2022	1,361.4	464.0	142.1	49.7	88.3	667.0	621.7	481.7	182.3	117.7	48.0	47.7	133.9	97.2
2022 Oct.	1,359.5	459.9	146.1	53.9	100.8	652.7	592.7	559.1	248.0	135.4	59.0	57.8	117.8	91.2
Nov.	1,401.6	483.0	144.2	52.2	96.6	677.9	628.6	612.9	266.4	144.9	64.0	49.0	152.6	132.1
Dec.	1,361.4	464.0	142.1	49.7	88.3	667.0	621.7	428.3	162.9	137.8	61.2	43.5	84.2	71.1
2023 Jan.	1,377.8	513.7	133.7	47.8	89.5	640.9	594.0	511.1	221.2	108.0	39.8	50.2	131.7	112.2
Feb.	1,370.6	528.5	138.1	50.0	89.6	614.3	569.2	499.1	225.9	100.3	34.7	48.9	124.1	96.2
Mar.	1,399.7	536.1	133.2	46.5	85.2	645.1	598.9	566.6	240.4	117.7	34.4	48.0	160.5	127.1
					Long-term									
2020	19,385.1	4,071.0	3,211.6	1,253.8	1,541.5	10,560.9	9,773.7	.	.	.	.	.	.	.
2021	20,042.5	4,176.4	3,512.7	1,340.4	1,596.1	10,757.4	9,936.4	315.8	67.0	84.2	34.1	22.8	141.9	128.4
2022	18,043.6	3,970.3	3,427.9	1,336.4	1,382.6	9,262.8	8,551.3	300.7	78.3	75.7	29.0	16.1	130.6	121.1
2022 Oct.	18,231.8	4,026.0	3,415.2	1,309.6	1,366.3	9,424.2	8,698.7	332.0	79.0	69.0	24.1	12.6	171.5	163.4
Nov.	18,599.6	4,087.0	3,471.8	1,329.9	1,411.0	9,629.8	8,892.2	327.2	78.3	91.3	39.8	23.1	134.4	120.8
Dec.	18,043.6	3,970.3	3,427.9	1,336.4	1,382.6	9,262.8	8,551.3	196.4	48.4	77.1	41.1	11.2	59.6	57.3
2023 Jan.	18,416.0	4,084.0	3,449.3	1,323.9	1,414.1	9,468.6	8,743.5	375.5	154.0	46.0	9.8	26.4	149.0	133.3
Feb.	18,328.7	4,077.0	3,448.8	1,328.1	1,403.8	9,399.2	8,676.2	357.5	100.3	53.3	11.7	18.1	185.8	168.7
Mar.	18,565.1	4,096.7	3,457.2	1,334.8	1,401.6	9,609.6	8,874.6	324.6	79.9	66.6	25.5	15.4	162.8	150.3

Source: ECB.
1) In order to facilitate comparison, annual data are averages of the relevant monthly data.

4.7 Annual growth rates and outstanding amounts of debt securities and listed shares
(EUR billions and percentage changes; market values)

	Debt securities							Listed shares			
	Total	MFIs	Non-MFI corporations			General government		Total	MFIs	Financial corporations other than MFIs	Non-financial corporations
			Financial corporations other than MFIs	FVCs	Non-financial corporations		of which central government				
	1	2	3	4	5	6	7	8	9	10	11
					Outstanding amount						
2020	20,874.3	4,500.8	3,338.5	1,306.3	1,637.9	11,397.1	10,496.2	8,517.8	473.6	1,310.3	6,732.9
2021	21,454.9	4,604.2	3,644.7	1,390.4	1,683.8	11,522.1	10,611.2	10,395.4	612.4	1,552.9	8,229.1
2022	19,405.0	4,434.3	3,570.1	1,386.2	1,470.9	9,929.8	9,173.0	8,762.2	537.3	1,350.9	6,873.3
2022 Oct.	19,591.2	4,485.9	3,561.3	1,363.5	1,467.1	10,076.9	9,291.4	8,513.4	509.7	1,264.0	6,739.0
Nov.	20,001.2	4,570.0	3,616.1	1,382.1	1,507.6	10,307.6	9,520.9	9,097.2	542.8	1,373.0	7,180.8
Dec.	19,405.0	4,434.3	3,570.1	1,386.2	1,470.9	9,929.8	9,173.0	8,762.2	537.3	1,350.9	6,873.3
2023 Jan.	19,793.9	4,597.7	3,583.0	1,371.7	1,503.6	10,109.5	9,337.4	9,500.6	608.6	1,457.2	7,434.2
Feb.	19,699.3	4,605.5	3,586.9	1,378.1	1,493.5	10,013.5	9,245.4	9,637.8	642.6	1,482.6	7,512.0
Mar.	19,964.8	4,632.7	3,590.4	1,381.3	1,486.9	10,254.8	9,473.5	9,660.3	571.4	1,437.7	7,650.6
					Growth rate [1]						
2022 Aug.	3.7	3.2	8.4	6.0	2.2	2.7	3.1	0.7	-0.7	2.6	0.5
Sep.	3.4	3.9	7.1	3.4	1.5	2.4	2.8	0.4	-0.9	2.3	0.2
Oct.	3.5	4.6	5.2	1.7	0.6	2.8	3.3	0.4	-1.1	2.3	0.2
Nov.	3.9	5.4	6.0	1.9	0.2	3.2	3.8	0.2	-1.3	1.7	0.0
Dec.	3.8	4.8	5.3	0.3	0.7	3.2	3.8	0.3	-1.6	1.5	0.2
2023 Jan.	4.1	7.2	4.6	-0.1	0.5	3.1	3.7	0.2	-2.0	0.9	0.2
Feb.	4.2	7.9	3.7	-0.9	1.1	3.3	3.9	0.2	-2.2	1.1	0.3
Mar.	3.7	7.0	2.9	-1.4	-0.7	3.3	3.9	0.2	-2.2	1.0	0.2

Source: ECB.
1) For details on the calculation of growth rates, see the Technical Notes.

4 Financial market developments

4.8 Effective exchange rates [1]
(period averages; index: 1999 Q1=100)

| | EER-18 | | | | | | EER-41 | |
| | Nominal | Real CPI | Real PPI | Real GDP deflator | Real ULCM | Real ULCT | Nominal | Real CPI |
	1	2	3	4	5	6	7	8
2020	99.7	93.6	93.4	89.4	75.9	87.8	119.5	93.9
2021	99.6	93.5	93.3	88.6	71.1	86.0	120.9	94.3
2022	95.5	90.7	93.1	83.7	66.1	81.4	116.8	90.8
2022 Q2	95.6	90.3	93.2	83.4	66.5	81.1	116.5	90.2
Q3	94.0	89.3	92.2	81.8	64.2	79.9	114.5	88.9
Q4	95.9	91.8	94.6	84.5	65.0	81.8	117.3	91.7
2023 Q1	97.4	92.6	96.5	.	.	.	120.2	93.1
2022 Nov.	96.0	92.0	94.5	-	-	-	117.2	91.8
Dec.	97.0	92.3	95.4	-	-	-	119.2	92.6
2023 Jan.	97.3	92.5	96.3	-	-	-	119.9	92.9
Feb.	97.3	92.6	96.4	-	-	-	120.1	93.1
Mar.	97.5	92.7	96.7	-	-	-	120.5	93.3
Apr.	98.6	93.8	97.9	-	-	-	122.3	94.6
	Percentage change versus previous month							
2023 Apr.	1.1	1.1	1.2	-	-	-	1.5	1.4
	Percentage change versus previous year							
2023 Apr.	3.5	4.2	5.8	-	-	-	4.9	4.8

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

4.9 Bilateral exchange rates
(period averages; units of national currency per euro)

| | Chinese renminbi | 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
2020	7.875	26.455	7.454	351.249	121.846	4.443	0.890	4.8383	10.485	1.071	1.142
2021	7.628	25.640	7.437	358.516	129.877	4.565	0.860	4.9215	10.146	1.081	1.183
2022	7.079	24.566	7.440	391.286	138.027	4.686	0.853	4.9313	10.630	1.005	1.053
2022 Q2	7.043	24.644	7.440	385.826	138.212	4.648	0.848	4.9449	10.479	1.027	1.065
Q3	6.898	24.579	7.439	403.430	139.164	4.744	0.856	4.9138	10.619	0.973	1.007
Q4	7.258	24.389	7.438	410.825	144.238	4.727	0.870	4.9208	10.938	0.983	1.021
2023 Q1	7.342	23.785	7.443	388.712	141.981	4.708	0.883	4.9202	11.203	0.992	1.073
2022 Nov.	7.317	24.369	7.439	406.683	145.124	4.696	0.869	4.9142	10.880	0.984	1.020
Dec.	7.386	24.269	7.438	407.681	142.822	4.683	0.870	4.9224	10.986	0.986	1.059
2023 Jan.	7.317	23.958	7.438	396.032	140.544	4.697	0.882	4.9242	11.205	0.996	1.077
Feb.	7.324	23.712	7.445	384.914	142.377	4.742	0.886	4.9087	11.172	0.990	1.072
Mar.	7.381	23.683	7.446	385.013	143.010	4.689	0.882	4.9263	11.228	0.991	1.071
Apr.	7.556	23.437	7.452	375.336	146.511	4.632	0.881	4.9365	11.337	0.985	1.097
	Percentage change versus previous month										
2023 Apr.	2.4	-1.0	0.1	-2.5	2.4	-1.2	-0.1	0.2	1.0	-0.6	2.4
	Percentage change versus previous year										
2023 Apr.	8.6	-4.1	0.2	0.1	7.3	-0.4	5.3	-0.2	9.9	-3.6	1.4

Source: ECB.

4 Financial market developments

4.10 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)							
2022 Q1	34,374.4	34,199.6	174.9	11,998.6	9,931.6	12,335.5	13,992.7	-56.4	6,850.8	8,131.4	1,102.0	16,351.9
Q2	34,621.2	34,203.6	417.6	12,364.3	10,175.0	11,510.6	13,097.5	-18.1	7,032.8	8,320.5	1,120.9	16,445.2
Q3	35,380.7	34,905.8	474.9	12,679.9	10,483.3	11,188.1	12,779.6	-6.0	7,144.4	8,402.9	1,134.3	16,561.5
Q4	33,589.3	33,324.0	265.3	12,067.9	9,891.1	11,100.5	12,722.1	20.6	6,580.7	8,003.8	1,112.6	15,755.2
				Outstanding amounts as a percentage of GDP								
2022 Q4	250.7	248.7	2.0	90.1	73.8	82.8	94.9	0.2	49.1	59.7	8.3	117.6
					Transactions							
2022 Q1	369.2	378.9	-9.7	55.6	42.6	-17.8	28.8	-1.6	334.0	307.5	-0.9	-
Q2	-32.9	-62.0	29.0	64.0	-47.2	-126.8	-86.5	28.8	-1.2	71.7	2.3	-
Q3	2.4	55.2	-52.8	68.0	86.7	-184.0	-8.3	43.9	67.1	-23.3	7.4	-
Q4	-639.0	-686.4	47.3	-377.9	-398.7	93.6	108.4	-8.3	-355.4	-396.1	9.1	-
2022 Sep.	-210.1	-159.7	-50.5	1.3	-23.3	-117.7	34.9	17.5	-114.9	-171.3	3.6	-
Oct.	-30.2	-47.0	16.8	-122.5	-120.9	1.4	21.2	0.8	86.2	52.7	3.9	-
Nov.	-32.8	-3.0	-29.8	7.4	4.5	39.3	93.5	0.0	-80.0	-101.0	0.5	-
Dec.	-576.1	-636.4	60.3	-262.8	-282.3	52.9	-6.3	-9.1	-361.6	-347.8	4.6	-
2023 Jan.	231.0	222.0	9.0	-1.2	16.2	50.6	41.9	9.7	180.5	164.0	-8.6	-
Feb.	74.4	79.6	-5.2	41.4	7.1	6.2	49.6	11.2	27.0	22.9	-11.4	-
				12-month cumulated transactions								
2023 Feb.	-358.7	-362.1	3.4	-209.3	-343.6	-201.7	175.2	82.7	-29.1	-193.6	-1.3	-
				12-month cumulated transactions as a percentage of GDP								
2023 Feb.	-2.7	-2.7	0.0	-1.6	-2.6	-1.5	1.3	0.6	-0.2	-1.4	0.0	-

Source: ECB.
1) Net financial derivatives are included in total assets.

5 Financing conditions and credit developments

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												
2020	1,363.7	8,876.3	10,240.0	1,026.7	2,449.4	3,476.1	13,716.1	101.8	627.0	4.4	733.1	14,449.2
2021	1,469.7	9,784.0	11,253.8	916.1	2,506.4	3,422.5	14,676.2	118.0	647.2	21.5	786.7	15,462.9
2022	1,538.5	9,780.7	11,319.2	1,377.7	2,566.6	3,944.3	15,263.5	123.3	649.9	46.9	820.2	16,083.7
2022 Q2	1,528.0	10,051.8	11,579.7	972.9	2,530.6	3,503.5	15,083.2	115.9	609.1	64.6	789.7	15,872.9
Q3	1,538.2	10,177.5	11,715.7	1,175.9	2,552.7	3,728.4	15,444.1	120.4	598.0	48.9	767.4	16,211.5
Q4	1,538.5	9,780.7	11,319.2	1,377.7	2,566.6	3,944.3	15,263.5	123.3	649.9	46.9	820.2	16,083.7
2023 Q1 (p)	1,544.0	9,453.1	10,997.1	1,642.9	2,548.3	4,191.2	15,188.3	103.2	682.2	92.6	878.1	16,066.4
2022 Oct.	1,541.3	10,022.4	11,563.7	1,253.7	2,556.2	3,810.0	15,373.7	125.0	622.6	19.6	767.3	16,141.0
Nov.	1,541.3	9,907.9	11,449.2	1,327.9	2,551.5	3,879.4	15,328.5	138.8	638.8	38.5	816.1	16,144.6
Dec.	1,538.5	9,780.7	11,319.2	1,377.7	2,566.6	3,944.3	15,263.5	123.3	649.9	46.9	820.2	16,083.7
2023 Jan.	1,540.7	9,729.7	11,270.4	1,457.7	2,560.6	4,018.3	15,288.7	133.8	636.3	50.0	820.2	16,108.9
Feb.	1,539.6	9,594.0	11,133.6	1,544.0	2,557.5	4,101.5	15,235.1	124.2	653.5	80.8	858.4	16,093.5
Mar. (p)	1,544.0	9,453.1	10,997.1	1,642.9	2,548.3	4,191.2	15,188.3	103.2	682.2	92.6	878.1	16,066.4
Transactions												
2020	139.2	1,243.9	1,383.2	-33.8	86.3	52.5	1,435.7	19.6	111.0	1.2	131.7	1,567.4
2021	107.4	898.7	1,006.1	-121.6	66.7	-55.0	951.1	12.1	20.9	14.4	47.3	998.4
2022	68.8	-1.9	66.9	427.2	56.7	484.0	550.8	3.7	3.0	77.9	84.7	635.6
2022 Q2	7.6	111.4	118.9	30.6	10.5	41.1	160.0	-8.6	18.0	16.9	26.3	186.4
Q3	10.2	117.9	128.1	160.5	21.8	182.3	310.4	2.7	-11.0	38.8	30.4	340.8
Q4	0.3	-361.2	-360.9	212.4	13.9	226.3	-134.6	4.8	52.0	-0.9	55.8	-78.8
2023 Q1 (p)	4.2	-371.5	-367.3	259.7	-12.9	246.8	-120.5	-20.6	32.3	44.5	56.2	-64.3
2022 Oct.	3.1	-150.7	-147.6	80.3	3.2	83.6	-64.0	5.0	24.6	-28.1	1.6	-62.4
Nov.	-0.1	-99.8	-99.9	79.0	-4.6	74.4	-25.5	14.6	16.2	16.7	47.6	22.1
Dec.	-2.8	-110.7	-113.5	53.1	15.3	68.3	-45.2	-14.8	11.1	10.4	6.7	-38.5
2023 Jan.	0.9	-99.0	-98.1	74.6	-0.9	73.6	-24.5	9.9	-13.6	4.6	0.9	-23.6
Feb.	-1.1	-138.4	-139.5	83.9	-3.2	80.7	-58.8	-10.1	17.1	28.6	35.6	-23.1
Mar. (p)	4.4	-134.1	-129.7	101.2	-8.8	92.5	-37.3	-20.4	28.7	11.3	19.7	-17.6
Growth rates												
2020	11.4	16.2	15.5	-3.2	3.7	1.5	11.6	24.4	21.3	-	21.8	12.1
2021	7.9	10.1	9.8	-11.8	2.7	-1.6	6.9	12.0	3.3	371.3	6.5	6.9
2022	4.7	0.0	0.6	45.7	2.3	14.0	3.7	3.0	0.5	526.6	11.4	4.1
2022 Q2	7.8	7.2	7.3	2.5	1.8	2.0	6.0	-2.6	-1.2	115.6	2.9	5.8
Q3	6.5	5.5	5.7	23.6	2.3	8.0	6.2	-4.5	-1.3	332.1	7.5	6.3
Q4	4.7	0.0	0.6	45.7	2.3	14.0	3.7	3.0	0.5	526.6	11.4	4.1
2023 Q1 (p)	1.5	-5.1	-4.2	68.7	1.3	20.0	1.4	-17.5	15.4	494.6	23.4	2.5
2022 Oct.	6.0	3.5	3.8	30.2	2.3	9.9	5.2	-7.9	-0.6	58.4	3.0	5.1
Nov.	5.4	2.0	2.4	38.6	1.9	12.0	4.7	8.2	-1.0	241.8	8.3	4.8
Dec.	4.7	0.0	0.6	45.7	2.3	14.0	3.7	3.0	0.5	526.6	11.4	4.1
2023 Jan.	3.8	-1.5	-0.8	49.6	2.1	15.2	2.9	2.6	6.0	246.4	13.7	3.4
Feb.	2.9	-3.5	-2.7	59.0	1.7	17.5	2.0	-6.1	11.8	459.9	21.2	2.9
Mar. (p)	1.5	-5.1	-4.2	68.7	1.3	20.0	1.4	-17.5	15.4	494.6	23.4	2.5

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

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													
2020	2,966.0	2,514.2	308.2	140.2	3.3	7,665.2	4,967.3	437.0	2,260.1	0.9	1,090.4	235.3	497.3
2021	3,231.5	2,807.0	288.9	128.7	6.9	8,090.5	5,383.9	372.5	2,333.4	0.7	1,228.4	227.8	546.3
2022	3,362.5	2,725.5	495.9	135.3	5.9	8,392.2	5,555.3	442.8	2,393.3	0.9	1,298.6	235.0	560.0
2022 Q2	3,312.2	2,866.1	304.4	131.0	10.8	8,255.4	5,540.2	354.0	2,360.5	0.7	1,301.9	231.3	570.3
Q3	3,368.1	2,837.4	388.3	133.7	8.8	8,372.0	5,620.1	370.0	2,380.9	1.0	1,490.5	243.9	551.9
Q4	3,362.5	2,725.5	495.9	135.3	5.9	8,392.2	5,555.3	442.8	2,393.3	0.9	1,298.6	235.0	560.0
2023 Q1 (p)	3,340.8	2,598.9	600.8	132.6	8.4	8,392.8	5,447.4	567.4	2,377.1	0.9	1,202.6	231.8	579.5
2022 Oct.	3,392.8	2,805.2	446.3	132.0	9.3	8,385.4	5,613.9	384.9	2,385.6	1.1	1,367.1	255.0	557.1
Nov.	3,393.3	2,764.9	488.3	132.1	8.1	8,379.1	5,582.2	413.4	2,382.5	1.0	1,345.5	250.5	557.7
Dec.	3,362.5	2,725.5	495.9	135.3	5.9	8,392.2	5,555.3	442.8	2,393.3	0.9	1,298.6	235.0	560.0
2023 Jan.	3,375.8	2,697.2	536.6	134.6	7.4	8,439.1	5,564.2	485.0	2,389.1	0.8	1,271.0	237.1	558.9
Feb.	3,380.1	2,663.2	573.2	134.5	9.2	8,419.1	5,511.4	521.2	2,385.8	0.7	1,223.4	225.1	571.9
Mar. (p)	3,340.8	2,598.9	600.8	132.6	8.4	8,392.8	5,447.4	567.4	2,377.1	0.9	1,202.6	231.8	579.5
Transactions													
2020	510.9	465.4	55.3	-6.8	-3.0	612.8	561.7	-53.8	105.0	0.0	138.6	20.6	33.1
2021	251.7	276.8	-21.4	-6.9	3.3	424.5	412.7	-65.1	77.0	-0.2	142.4	-9.5	46.6
2022	120.0	-90.1	205.6	5.9	-1.4	298.3	169.2	74.1	54.9	0.1	45.1	7.6	14.7
2022 Q2	15.3	1.8	12.5	0.8	0.2	62.8	57.8	-4.8	10.1	-0.3	49.8	-0.6	16.5
Q3	46.4	-34.3	80.4	2.7	-2.3	113.2	77.4	15.2	20.3	0.3	150.3	11.4	-18.5
Q4	11.5	-100.5	112.9	1.6	-2.6	24.9	-61.4	74.3	12.1	-0.1	-167.6	-7.4	8.4
2023 Q1 (p)	-34.1	-137.1	104.7	-4.2	2.6	-32.9	-141.0	119.1	-11.1	0.1	-95.6	-1.9	19.2
2022 Oct.	28.1	-30.1	59.2	-1.6	0.6	14.4	-5.2	15.2	4.3	0.1	-121.3	11.3	5.3
Nov.	8.2	-35.1	44.4	0.1	-1.1	-4.0	-30.2	29.2	-3.0	0.0	-11.9	-3.9	0.7
Dec.	-24.9	-35.3	9.3	3.1	-2.1	14.5	-26.0	29.9	10.8	-0.2	-34.4	-14.9	2.4
2023 Jan.	0.7	-40.8	40.5	-0.6	1.6	13.0	-24.7	36.9	0.9	-0.1	-27.9	1.1	-2.4
Feb.	1.5	-35.6	35.4	-0.1	1.7	-20.7	-53.2	35.9	-3.3	-0.1	-51.0	-10.1	12.6
Mar. (p)	-36.2	-60.7	28.7	-3.5	-0.7	-25.2	-63.2	46.3	-8.6	0.2	-16.6	7.1	8.9
Growth rates													
2020	20.6	22.5	21.5	-4.5	-46.6	8.7	12.8	-10.9	4.9	-5.4	13.9	9.5	7.1
2021	8.5	11.0	-7.0	-4.9	99.4	5.5	8.3	-14.9	3.4	-18.3	13.0	-4.0	9.4
2022	3.7	-3.2	70.0	4.6	-17.2	3.7	3.1	20.0	2.4	20.0	3.9	3.4	2.7
2022 Q2	6.1	6.8	2.5	-1.2	22.5	4.1	6.2	-12.5	2.3	-15.0	12.0	2.7	16.0
Q3	5.9	3.2	34.0	1.8	-15.2	4.3	5.6	-4.2	2.6	55.7	18.1	7.2	6.5
Q4	3.7	-3.2	70.0	4.6	-17.2	3.7	3.1	20.0	2.4	20.0	3.9	3.4	2.7
2023 Q1 (p)	1.2	-9.4	106.0	0.6	-19.3	2.1	-1.2	56.6	1.3	-10.7	-4.7	0.7	4.6
2022 Oct.	5.9	1.3	50.9	1.8	2.6	4.1	5.1	1.2	2.5	7.6	7.1	8.4	7.5
Nov.	5.4	-0.9	66.9	1.7	-2.8	3.8	4.0	10.4	2.2	7.9	6.4	8.7	6.9
Dec.	3.7	-3.2	70.0	4.6	-17.2	3.7	3.1	20.0	2.4	20.0	3.9	3.4	2.7
2023 Jan.	3.2	-4.9	82.0	3.9	-28.1	3.3	1.9	31.6	2.2	-3.1	-0.5	-0.1	3.4
Feb.	2.6	-7.0	98.1	4.1	-20.6	2.6	0.4	42.7	1.8	-25.6	-5.1	-2.8	4.7
Mar. (p)	1.2	-9.4	106.0	0.6	-19.3	2.1	-1.2	56.6	1.3	-10.7	-4.7	0.7	4.6

Source: ECB.
1) Data refer to the changing composition of the euro area.
2) In accordance with the ESA 2010, in December 2014 holding companies of non-financial groups were reclassified from the non-financial corporations sector to the financial corporations sector. These entities are included in MFI balance sheet statistics with financial corporations other than MFIs and insurance corporations and pension funds (ICPFs).
3) Including non-profit institutions serving households.
4) Refers to the general government sector excluding central government.

5 Financing conditions and credit developments

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 corpor-ations [3]	To house-holds [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							
2020	5,906.9	998.1	4,896.9	14,323.0	11,911.0	12,289.7	4,706.6	6,132.9	904.7	166.8	1,547.5	864.5
2021	6,542.7	996.6	5,544.3	14,802.7	12,332.1	12,716.3	4,861.3	6,373.6	937.6	159.7	1,582.4	888.1
2022	6,374.1	1,007.4	5,341.6	15,388.0	12,981.7	13,155.0	5,127.1	6,633.3	1,075.0	146.5	1,569.9	836.4
2022 Q2	6,503.0	1,000.6	5,478.2	15,182.4	12,790.2	12,928.3	5,020.2	6,553.3	1,053.1	163.6	1,561.3	830.9
Q3	6,359.6	1,002.3	5,333.0	15,421.7	13,051.1	13,186.1	5,165.7	6,613.7	1,110.6	161.2	1,546.0	824.6
Q4	6,374.1	1,007.4	5,341.6	15,388.0	12,981.7	13,155.0	5,127.1	6,633.3	1,075.0	146.5	1,569.9	836.4
2023 Q1 (p)	6,359.2	995.7	5,338.6	15,408.7	13,012.5	13,178.7	5,129.9	6,665.8	1,078.3	138.5	1,546.0	850.2
2022 Oct.	6,378.8	996.3	5,358.1	15,411.9	13,040.9	13,174.5	5,187.9	6,622.5	1,071.0	159.5	1,537.2	833.8
Nov.	6,423.3	994.6	5,403.7	15,441.5	13,043.0	13,193.2	5,162.9	6,632.2	1,098.1	149.7	1,561.1	837.4
Dec.	6,374.1	1,007.4	5,341.6	15,388.0	12,981.7	13,155.0	5,127.1	6,633.3	1,075.0	146.5	1,569.9	836.4
2023 Jan.	6,379.7	996.3	5,358.5	15,422.3	13,028.0	13,200.1	5,141.1	6,655.4	1,084.5	147.0	1,557.8	836.6
Feb.	6,347.5	997.4	5,325.3	15,416.9	13,022.6	13,190.0	5,139.3	6,659.9	1,074.9	148.6	1,548.6	845.7
Mar. (p)	6,359.2	995.7	5,338.6	15,408.7	13,012.5	13,178.7	5,129.9	6,665.8	1,078.3	138.5	1,546.0	850.2
					Transactions							
2020	1,040.0	13.5	1,026.4	733.6	534.7	555.5	287.6	209.3	20.7	17.1	170.7	28.2
2021	665.6	-0.4	675.6	561.9	473.9	507.3	175.9	261.8	46.4	-10.2	78.9	9.2
2022	177.8	9.9	167.0	634.6	623.2	678.1	268.5	242.3	125.5	-13.0	17.8	-6.4
2022 Q2	68.6	-0.9	69.5	211.5	230.2	238.7	100.7	84.5	34.8	10.3	-13.9	-4.8
Q3	-36.6	2.1	-38.9	222.8	232.6	236.8	139.2	58.7	38.0	-3.2	-9.4	-0.5
Q4	45.1	4.2	40.2	3.6	-31.6	10.1	-17.4	27.4	-27.4	-14.2	22.6	12.6
2023 Q1 (p)	-78.2	-18.2	-59.9	-11.9	6.2	2.9	-3.5	14.0	3.4	-7.8	-26.9	8.8
2022 Oct.	11.8	-5.9	17.8	-4.8	-3.3	-1.9	25.6	10.2	-37.5	-1.6	-9.7	8.2
Nov.	7.7	-2.0	9.0	38.4	17.0	32.8	-18.0	13.0	31.5	-9.5	19.5	1.9
Dec.	25.6	12.1	13.4	-30.0	-45.3	-20.9	-25.0	4.2	-21.4	-3.1	12.8	2.6
2023 Jan.	-57.2	-17.6	-39.4	-4.0	12.7	7.5	1.3	1.5	9.3	0.6	-15.4	-1.3
Feb.	1.8	1.1	0.7	-9.0	-8.1	-8.4	-3.0	4.4	-11.1	1.6	-8.0	7.1
Mar. (p)	-22.8	-1.6	-21.2	1.1	1.6	3.8	-1.8	8.2	5.2	-10.0	-3.5	3.0
					Growth rates							
2020	22.1	1.4	27.8	5.3	4.7	4.7	6.4	3.5	2.3	10.2	11.4	3.4
2021	11.3	0.0	13.8	3.9	4.0	4.1	3.7	4.3	5.1	-4.6	5.2	1.1
2022	2.8	1.0	3.1	4.3	5.0	5.4	5.5	3.8	13.4	-7.9	1.1	-0.6
2022 Q2	8.4	-0.2	10.1	5.2	5.9	6.3	5.9	4.6	13.8	7.8	5.0	-2.7
Q3	5.0	0.5	5.8	5.8	6.7	7.1	8.0	4.4	14.9	10.0	3.4	-3.0
Q4	2.8	1.0	3.1	4.3	5.0	5.4	5.5	3.8	13.4	-7.9	1.1	-0.6
2023 Q1 (p)	0.0	-1.3	0.2	2.8	3.5	3.8	4.4	2.9	4.9	-9.8	-1.7	2.0
2022 Oct.	4.6	0.9	5.3	5.2	6.2	6.6	8.1	4.1	11.3	3.1	0.9	-1.7
Nov.	3.7	0.4	4.3	5.1	5.8	6.3	7.2	4.0	12.4	-6.4	2.8	-0.9
Dec.	2.8	1.0	3.1	4.3	5.0	5.4	5.5	3.8	13.4	-7.9	1.1	-0.6
2023 Jan.	1.4	-0.6	1.8	3.8	4.4	4.9	5.3	3.4	9.7	-12.6	0.9	-0.7
Feb.	0.7	-0.8	1.0	3.3	3.9	4.3	4.9	3.2	6.3	-11.0	0.3	0.6
Mar. (p)	0.0	-1.3	0.2	2.8	3.5	3.8	4.4	2.9	4.9	-9.8	-1.7	2.0

Source: ECB.
1) Data refer to the changing composition of the euro area.
2) Adjusted for loan sales and securitisation (resulting in derecognition from the MFI statistical balance sheet) as well as for positions arising from notional cash pooling services provided by MFIs.
3) In accordance with the ESA 2010, in December 2014 holding companies of non-financial groups were reclassified from the non-financial corporations sector to the financial corporations sector. These entities are included in MFI balance sheet statistics with financial corporations other than MFIs and insurance corporations and pension funds (ICPFs).
4) Including non-profit institutions serving households.

5 Financing conditions and credit developments

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					
2020	4,706.6	4,828.7	893.8	1,009.1	2,803.6	6,132.9	6,402.6	700.7	4,725.1	707.1
2021	4,861.3	4,993.1	885.3	1,005.5	2,970.5	6,373.6	6,638.4	698.5	4,971.1	703.9
2022	5,127.1	5,119.1	963.3	1,079.5	3,084.2	6,633.3	6,828.5	717.6	5,214.9	700.7
2022 Q2	5,020.2	4,995.6	949.8	1,028.1	3,042.2	6,553.3	6,742.9	709.0	5,139.2	705.1
Q3	5,165.7	5,136.5	1,008.1	1,068.1	3,089.5	6,613.7	6,802.4	714.0	5,195.4	704.2
Q4	5,127.1	5,119.1	963.3	1,079.5	3,084.2	6,633.3	6,828.5	717.6	5,214.9	700.7
2023 Q1 (p)	5,129.9	5,125.9	939.7	1,092.7	3,097.5	6,665.8	6,867.1	723.5	5,233.1	709.2
2022 Oct.	5,187.9	5,154.2	1,006.4	1,077.6	3,103.8	6,622.5	6,813.0	715.5	5,203.1	704.0
Nov.	5,162.9	5,142.9	993.0	1,071.3	3,098.7	6,632.2	6,826.4	716.9	5,211.3	704.0
Dec.	5,127.1	5,119.1	963.3	1,079.5	3,084.2	6,633.3	6,828.5	717.6	5,214.9	700.7
2023 Jan.	5,141.1	5,134.8	955.1	1,086.2	3,099.9	6,655.4	6,859.9	720.0	5,220.3	715.0
Feb.	5,139.3	5,131.3	945.5	1,091.4	3,102.4	6,659.9	6,864.0	721.7	5,225.6	712.6
Mar. (p)	5,129.9	5,125.9	939.7	1,092.7	3,097.5	6,665.8	6,867.1	723.5	5,233.1	709.2
					Transactions					
2020	287.6	324.9	-53.5	138.5	202.6	209.3	193.7	-11.6	210.8	10.2
2021	175.9	208.0	-1.4	2.4	174.9	261.8	267.2	10.7	255.0	-3.9
2022	268.5	306.8	78.5	77.6	112.4	242.3	249.4	22.7	218.5	1.1
2022 Q2	100.7	106.5	40.5	22.4	37.7	84.5	74.0	7.4	75.9	1.2
Q3	139.2	139.5	55.4	39.9	43.8	58.7	59.4	4.9	55.6	-1.8
Q4	-17.4	6.2	-38.2	18.2	2.6	27.4	36.0	5.2	21.9	0.2
2023 Q1 (p)	-3.5	2.7	-21.3	10.9	7.0	14.0	21.9	4.1	16.1	-6.2
2022 Oct.	25.6	24.3	-0.5	10.6	15.6	10.2	11.8	1.5	8.3	0.3
Nov.	-18.0	-5.8	-12.8	-2.6	-2.6	13.0	18.0	2.2	9.0	1.8
Dec.	-25.0	-12.2	-24.9	10.2	-10.4	4.2	6.2	1.5	4.6	-1.9
2023 Jan.	1.3	-0.8	-7.8	2.8	6.3	1.5	10.3	0.0	2.8	-1.3
Feb.	-3.0	-2.5	-10.4	5.2	2.2	4.4	6.3	1.6	5.1	-2.2
Mar. (p)	-1.8	5.9	-3.2	2.9	-1.5	8.2	5.3	2.6	8.2	-2.6
					Growth rates					
2020	6.4	7.1	-5.6	15.9	7.7	3.5	3.1	-1.6	4.7	1.5
2021	3.7	4.3	-0.1	0.2	6.2	4.3	4.2	1.5	5.4	-0.5
2022	5.5	6.3	8.8	7.7	3.8	3.8	3.8	3.3	4.4	0.2
2022 Q2	5.9	6.9	14.1	5.9	3.6	4.6	4.6	3.4	5.4	0.0
Q3	8.0	8.9	19.7	9.8	4.0	4.4	4.4	3.5	5.1	-0.1
Q4	5.5	6.3	8.8	7.7	3.8	3.8	3.8	3.3	4.4	0.2
2023 Q1 (p)	4.4	5.2	4.0	9.1	3.0	2.9	2.9	3.1	3.3	-0.9
2022 Oct.	8.1	8.9	16.9	11.0	4.6	4.1	4.2	3.3	4.9	0.0
Nov.	7.2	8.3	14.1	9.8	4.4	4.0	4.1	3.0	4.6	0.3
Dec.	5.5	6.3	8.8	7.7	3.8	3.8	3.8	3.3	4.4	0.2
2023 Jan.	5.3	6.1	7.5	8.6	3.6	3.4	3.6	3.1	3.9	0.0
Feb.	4.9	5.7	5.1	9.2	3.5	3.2	3.2	2.8	3.7	-0.4
Mar. (p)	4.4	5.2	4.0	9.1	3.0	2.9	2.9	3.1	3.3	-0.9

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 Financing conditions and credit developments

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										
2020	723.2	6,955.9	1,913.6	42.2	1,990.8	3,009.2	1,441.4	457.1	136.7	141.1
2021	762.6	6,883.5	1,837.3	37.1	1,997.2	3,011.8	1,372.0	391.7	128.5	136.8
2022	683.7	6,753.0	1,780.8	31.0	2,119.3	2,822.0	1,334.0	424.2	137.8	147.6
2022 Q2	757.5	6,800.6	1,843.9	30.6	2,008.5	2,917.5	1,313.6	432.1	166.5	157.3
Q3	642.5	6,781.8	1,801.9	30.6	2,096.5	2,852.9	1,318.9	535.4	148.0	146.7
Q4	683.7	6,753.0	1,780.8	31.0	2,119.3	2,822.0	1,334.0	424.2	137.8	147.6
2023 Q1 (p)	580.2	6,915.3	1,792.8	35.0	2,174.5	2,913.0	1,440.0	353.9	152.1	165.8
2022 Oct.	676.5	6,745.4	1,789.4	30.8	2,101.2	2,824.0	1,283.8	488.3	144.4	156.1
Nov.	692.4	6,792.6	1,788.3	30.9	2,109.5	2,863.9	1,316.2	448.7	161.2	170.6
Dec.	683.7	6,753.0	1,780.8	31.0	2,119.3	2,822.0	1,334.0	424.2	137.8	147.6
2023 Jan.	564.7	6,859.8	1,784.5	32.5	2,158.3	2,884.5	1,351.6	379.8	155.5	157.0
Feb.	553.8	6,837.2	1,785.8	33.9	2,176.9	2,840.6	1,337.6	382.4	154.6	159.6
Mar. (p)	580.2	6,915.3	1,792.8	35.0	2,174.5	2,913.0	1,440.0	353.9	152.1	165.8
Transactions										
2020	299.6	-35.8	-15.1	-8.0	-101.1	88.3	-59.7	117.3	-43.6	-47.5
2021	40.0	-37.2	-75.1	-5.0	-39.7	82.6	-116.3	-110.1	-8.3	-4.3
2022	-75.8	50.9	-89.8	-5.2	14.6	131.3	-66.2	-135.6	10.5	17.9
2022 Q2	17.2	20.0	-8.0	-4.2	-16.0	48.2	-61.1	4.5	7.2	-7.1
Q3	-115.0	-4.2	-47.1	0.0	-2.2	45.1	-26.2	61.6	-18.6	-10.6
Q4	41.0	63.6	-15.2	0.3	57.8	20.7	51.8	-74.6	-10.2	1.0
2023 Q1 (p)	-110.1	89.2	8.4	4.0	67.3	9.4	75.3	-70.4	15.0	18.9
2022 Oct.	34.0	-10.0	-11.8	0.1	12.5	-10.8	8.7	-54.2	-3.6	9.4
Nov.	15.5	36.9	2.0	0.1	33.2	1.6	18.7	9.7	16.9	14.5
Dec.	-8.4	36.7	-5.4	0.1	12.0	30.0	24.4	-30.1	-23.4	-22.9
2023 Jan.	-125.1	47.1	0.3	1.6	48.4	-3.1	3.1	-43.4	17.7	9.4
Feb.	-11.3	18.0	0.2	1.3	6.3	10.2	7.5	-16.7	-0.2	3.0
Mar. (p)	26.3	24.1	8.0	1.1	12.7	2.3	64.7	-10.3	-2.5	6.5
Growth rates										
2020	84.6	-0.5	-0.8	-15.8	-4.7	3.0	-	-	-24.2	-25.2
2021	5.5	-0.5	-3.9	-11.9	-2.0	2.8	-	-	-6.0	-3.0
2022	-10.0	0.8	-4.8	-14.3	0.6	4.5	-	-	7.9	12.7
2022 Q2	12.2	-0.1	-3.0	-21.5	-1.5	3.1	-	-	26.0	21.7
Q3	-7.4	-0.1	-4.8	-18.6	-2.0	4.4	-	-	4.4	4.2
Q4	-10.0	0.8	-4.8	-14.3	0.6	4.5	-	-	7.9	12.7
2023 Q1 (p)	-22.6	2.5	-3.3	0.6	5.1	4.3	-	-	-4.2	1.3
2022 Oct.	-8.2	-0.4	-5.0	-17.1	-2.3	3.9	-	-	2.4	9.6
Nov.	-2.8	0.2	-4.4	-15.8	-0.7	3.8	-	-	11.3	18.5
Dec.	-10.0	0.8	-4.8	-14.3	0.6	4.5	-	-	7.9	12.7
2023 Jan.	-23.0	1.5	-4.4	-8.9	2.9	4.3	-	-	-7.2	-1.8
Feb.	-25.2	2.0	-3.8	-4.3	3.5	4.6	-	-	-7.6	0.2
Mar. (p)	-22.6	2.5	-3.3	0.6	5.1	4.3	-	-	-4.2	1.3

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
2019	-0.6	-1.0	0.1	0.1	0.3	1.0
2020	-7.1	-5.8	-0.4	0.0	-0.9	-5.6
2021	-5.3	-5.3	-0.1	0.0	0.0	-3.9
2022	-3.6	-3.9	0.0	0.0	0.3	-1.9
2022 Q1	-4.2	.	.	.	.	-2.8
Q2	-3.2	.	.	.	.	-1.6
Q3	-3.2	.	.	.	.	-1.7
Q4	-3.6	.	.	.	.	-1.9

Sources: ECB for annual data; Eurostat for quarterly data.
Note: Euro area data include Croatia.

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				Compensation of employees	Intermediate consumption	Interest	Social benefits	
	1	2	3	4	5	6	7	8	9	10	11	12	13
2019	46.3	45.8	12.9	13.1	15.0	0.5	46.9	43.2	9.9	5.4	1.6	22.4	3.8
2020	46.4	45.9	12.9	12.7	15.5	0.5	53.5	48.9	10.6	5.9	1.5	25.3	4.6
2021	47.3	46.5	13.2	13.2	15.2	0.8	52.6	47.5	10.3	6.0	1.5	24.1	5.1
2022	47.1	46.4	13.6	13.0	14.9	0.8	50.7	45.7	9.9	5.9	1.7	22.9	5.1
2022 Q1	47.2	46.5	13.3	13.2	15.1	0.8	51.5	46.5	10.1	5.9	1.5	23.7	5.0
Q2	47.4	46.6	13.5	13.2	15.0	0.8	50.6	45.7	10.0	5.9	1.5	23.3	4.9
Q3	47.4	46.7	13.7	13.2	15.0	0.7	50.6	45.6	9.9	5.9	1.6	23.1	5.0
Q4	47.1	46.4	13.6	13.0	14.9	0.8	50.8	45.7	9.9	5.9	1.7	23.0	5.1

Sources: ECB for annual data; Eurostat for quarterly data.
Note: Euro area data include Croatia.

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		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 currencies
						MFIs								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2019	84.0	3.0	13.2	67.8	45.7	30.9	38.3	7.8	76.3	15.6	27.8	40.7	82.7	1.3
2020	97.2	3.2	14.5	79.5	54.6	39.2	42.5	11.1	86.0	18.9	30.9	47.4	95.5	1.7
2021	95.4	3.0	13.9	78.5	55.6	41.7	39.8	9.9	85.5	17.6	30.3	47.5	94.0	1.4
2022	91.5	2.7	13.3	75.5	53.8	40.8	37.7	8.7	82.8	16.4	29.0	46.0	90.5	0.9
2022 Q1	95.2	2.9	13.6	78.7	.	.	.	.	.	.	.	.	.	.
Q2	94.2	2.9	13.6	77.7	.	.	.	.	.	.	.	.	.	.
Q3	92.9	2.9	13.6	76.4	.	.	.	.	.	.	.	.	.	.
Q4	91.5	2.7	13.3	75.5	.	.	.	.	.	.	.	.	.	.

Sources: ECB for annual data; Eurostat for quarterly data.
Note: Euro area data include Croatia.

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
2019	-2.0	-1.0	0.1	0.2	0.1	0.0	0.0	0.2	-0.1	0.0	-1.2	0.9
2020	13.1	5.6	2.2	2.5	2.0	0.4	-0.1	0.1	-0.3	0.0	5.3	9.5
2021	-1.7	3.9	-0.3	0.7	0.4	0.1	0.0	0.1	-0.1	-0.8	-5.3	5.1
2022	-4.0	1.9	-0.3	-0.3	-0.6	0.1	0.1	0.2	0.6	-0.6	-5.6	2.8
2022 Q1	-4.5	2.8	0.1	0.8	0.5	0.1	0.0	0.2	0.0	-0.6	-7.4	4.4
Q2	-3.8	1.6	0.5	1.0	0.8	0.0	0.0	0.2	0.1	-0.6	-6.0	3.6
Q3	-4.5	1.7	-0.2	0.0	-0.3	0.1	0.0	0.2	0.2	-0.5	-5.9	2.8
Q4	-4.0	1.9	-0.3	-0.3	-0.6	0.1	0.1	0.2	0.6	-0.6	-5.6	2.8

Sources: ECB for annual data; Eurostat for quarterly data.
Note: Euro area data include Croatia.
1) Intergovernmental lending in the context of the financial crisis is consolidated except in quarterly data on the deficit-debt adjustment.
2) Calculated as the difference between the government debt-to-GDP ratios at the end of the reference period and a year earlier.

6.5 Government debt securities [1]
(debt service as a percentage of GDP; flows during debt service period; average nominal yields in percentages per annum)

	Debt service due within 1 year [2]					Average residual maturity in years [3]	Average nominal yields [4]						
	Total	Principal		Interest			Outstanding amounts					Transactions	
			Maturities of up to 3 months		Maturities of up to 3 months		Total	Floating rate	Zero coupon	Fixed rate		Issuance	Redemption
											Maturities of up to 1 year		
	1	2	3	4	5	6	7	8	9	10	11	12	13
2020	14.9	13.5	4.2	1.4	0.4	7.6	2.0	1.2	-0.1	2.2	2.1	0.0	0.8
2021	14.1	12.8	4.2	1.3	0.3	7.9	1.6	1.1	-0.4	1.9	1.9	-0.1	0.5
2022	13.2	12.0	4.2	1.3	0.3	8.0	1.6	1.2	0.4	1.8	1.9	1.1	0.5
2021 Q4	14.1	12.8	4.2	1.3	0.3	7.9	1.6	1.1	-0.4	1.9	1.9	-0.1	0.5
2022 Q1	13.6	12.4	4.6	1.3	0.3	8.0	1.6	1.1	-0.3	1.9	1.8	-0.1	0.4
Q2	13.6	12.3	4.4	1.3	0.3	8.0	1.6	1.1	-0.2	1.9	1.8	0.1	0.4
Q3	13.0	11.8	3.7	1.3	0.3	8.1	1.6	1.1	0.0	1.9	1.9	0.6	0.4
2022 Oct.	13.4	12.1	3.5	1.3	0.3	8.1	1.6	1.1	0.1	1.9	1.9	0.7	0.5
Nov.	13.4	12.1	3.6	1.3	0.3	8.1	1.6	1.2	0.3	1.9	1.9	1.0	0.5
Dec.	13.2	12.0	4.2	1.3	0.3	8.0	1.6	1.2	0.4	1.8	1.9	1.1	0.5
2023 Jan.	13.2	11.9	4.3	1.3	0.3	8.0	1.7	1.2	0.6	1.9	1.9	1.4	0.6
Feb.	13.3	12.0	4.6	1.2	0.3	8.1	1.7	1.2	0.8	1.9	2.1	1.7	0.7
Mar.	13.5	12.3	4.2	1.2	0.3	8.1	1.7	1.2	0.9	1.9	2.0	2.0	0.7

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	Croatia	Italy	Cyprus
	1	2	3	4	5	6	7	8	9	10
Government deficit (-)/surplus (+)										
2019	-2.0	1.5	0.1	0.5	0.9	-3.1	-3.1	0.2	-1.5	1.3
2020	-9.0	-4.3	-5.5	-5.0	-9.7	-10.1	-9.0	-7.3	-9.7	-5.8
2021	-5.5	-3.7	-2.4	-1.6	-7.1	-6.9	-6.5	-2.5	-9.0	-2.0
2022	-3.9	-2.6	-0.9	1.6	-2.3	-4.8	-4.7	0.4	-8.0	2.1
2022 Q1	-4.7	-2.8	-1.8	-0.2	-5.1	-5.5	-5.2	-1.7	-8.3	-0.3
Q2	-4.0	-1.7	-0.5	0.6	-2.8	-4.9	-4.1	-0.3	-7.4	0.9
Q3	-3.7	-2.2	-0.3	1.6	-3.1	-4.1	-4.2	0.5	-7.8	2.6
Q4	-3.9	-2.6	-0.9	1.6	-2.3	-4.8	-4.7	0.4	-8.0	2.1
Government debt										
2019	97.6	59.6	8.5	57.0	180.6	98.2	97.4	71.0	134.1	90.8
2020	112.0	68.7	18.5	58.4	206.3	120.4	114.6	87.0	154.9	113.8
2021	109.1	69.3	17.6	55.4	194.6	118.3	112.9	78.4	149.9	101.2
2022	105.1	66.3	18.4	44.7	171.3	113.2	111.6	68.4	144.4	86.5
2022 Q1	109.0	67.9	17.2	53.1	189.4	117.4	114.6	76.0	151.4	102.0
Q2	108.5	67.7	16.8	51.2	183.0	116.1	113.1	73.2	149.3	95.4
Q3	106.5	67.0	15.9	49.1	175.8	115.6	113.4	70.4	145.9	91.4
Q4	105.1	66.3	18.4	44.7	171.3	113.2	111.6	68.4	144.4	86.5

	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Austria	Portugal	Slovenia	Slovakia	Finland
	11	12	13	14	15	16	17	18	19	20
Government deficit (-)/surplus (+)										
2019	-0.6	0.5	2.2	0.5	1.8	0.6	0.1	0.7	-1.2	-0.9
2020	-4.4	-6.5	-3.4	-9.7	-3.7	-8.0	-5.8	-7.7	-5.4	-5.6
2021	-7.1	-1.2	0.7	-7.8	-2.4	-5.8	-2.9	-4.6	-5.4	-2.8
2022	-4.4	-0.6	0.2	-5.8	0.0	-3.2	-0.4	-3.0	-2.0	-0.9
2022 Q1	-5.3	-0.1	0.8	-7.7	-1.4	-3.8	-1.7	-3.7	-4.6	-1.9
Q2	-4.4	0.8	1.0	-6.5	0.1	-1.9	0.1	-3.2	-3.3	-1.2
Q3	-4.1	0.8	0.8	-5.7	0.3	-2.5	1.0	-3.0	-2.8	-0.9
Q4	-4.4	-0.6	0.2	-5.8	0.0	-3.2	-0.4	-3.0	-2.1	-0.9
Government debt										
2019	36.5	35.8	22.4	40.3	48.5	70.6	116.6	65.4	48.0	64.9
2020	42.0	46.3	24.5	52.9	54.7	82.9	134.9	79.6	58.9	74.7
2021	43.7	43.7	24.5	55.1	52.5	82.3	125.4	74.5	61.0	72.6
2022	40.8	38.4	24.6	53.4	51.0	78.4	113.9	69.9	57.8	73.0
2022 Q1	41.8	39.8	22.6	56.1	50.9	83.4	124.6	74.6	61.6	72.5
Q2	41.7	39.6	25.3	53.8	51.0	82.6	123.1	73.5	60.3	72.8
Q3	40.0	37.3	24.6	52.9	49.1	81.3	119.9	72.4	58.6	72.0
Q4	40.8	38.4	24.6	53.4	51.0	78.4	113.9	69.9	58.8	73.0

Source: Eurostat.