Economic Bulletin

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Economic, financial and monetary developments

Overview

Inflation is projected to remain too high for too long. Therefore, on 16 March 2023 the Governing Council decided to increase the three key ECB interest rates by 50 basis points, in line with its determination to ensure the timely return of inflation to the 2% medium-term target. The elevated level of uncertainty reinforces the importance of a data-dependent approach to the Governing Council's policy rate decisions, which will be determined by its 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 Governing Council also announced that it was monitoring current market tensions closely. It stands ready to respond as necessary to preserve price stability and financial stability in the euro area. The Governing Council said that the euro area banking sector was resilient, with strong capital and liquidity positions. In any case, the ECB's policy toolkit is fully equipped to provide liquidity support to the euro area financial system if needed and to preserve the smooth transmission of monetary policy.

The new ECB staff macroeconomic projections were finalised in early March before the recent emergence of financial market tensions. As such, these tensions imply additional uncertainty around the baseline assessments of inflation and growth. Prior to these latest developments, the baseline path for headline inflation had already been revised down, mainly owing to a smaller contribution from energy prices than previously expected. ECB staff now see inflation averaging 5.3% in 2023, 2.9% in 2024 and 2.1% in 2025. At the same time, underlying price pressures remain strong. Inflation excluding energy and food continued to increase in February and ECB staff expect it to average 4.6% in 2023, which is higher than foreseen in the December projections. Subsequently, it is projected to come down to 2.5% in 2024 and 2.2% in 2025, as the upward pressures from past supply shocks and the reopening of the economy fade out and as tighter monetary policy increasingly dampens demand.

The baseline projections for growth in 2023 have been revised up to an average of 1.0% as a result of both the decline in energy prices and the economy's greater resilience to the challenging international environment. ECB staff then expect growth to pick up further, to 1.6%, in both 2024 and 2025, underpinned by a robust labour market, improving confidence and a recovery in real incomes. At the same time, the pick-up in growth in 2024 and 2025 is weaker than projected in December, owing to the tightening of monetary policy.

Economic activity

Global economic activity remained subdued at the turn of the year, but near-term prospects have brightened, buoyed by China's economic reopening and the continued resilience of labour markets across advanced economies. The easing of supply constraints continues to underpin global trade and, despite headline inflation declining, underlying price pressures remain strong. Against this backdrop, the global growth outlooks for 2023 and 2024 included in the March 2023 ECB staff macroeconomic projections for the euro area have been revised upwards compared with the December 2022 Eurosystem staff macroeconomic projections. While the reopening of China's economy will support global growth this year, global economic activity remains relatively subdued, with growth rates still below historical averages over the whole projection horizon from 2023 to 2025. Global trade projections have also been revised upwards to reflect China's economic reopening and the further easing of global supply chain constraints. There are growing signs that global consumer price index (CPI) inflation already peaked in 2022, although price pressures in the global economy remain high. Disinflation is being bolstered by waning supply disruptions, falling energy prices and synchronised monetary policy tightening across the world. However, resilient labour markets and strong wage growth, especially in major advanced economies, suggest that underlying inflationary pressures in the global economy remain strong and that the disinflation process will be gradual.

The euro area economy stagnated in the fourth quarter of 2022, thus avoiding the previously expected contraction. However, private domestic demand fell sharply. High inflation, prevailing uncertainties and tighter financing conditions dented private consumption and investment, which fell by 0.9% and 3.6% respectively. Under the baseline, the economy looks set to recover over the coming quarters. Industrial production should pick up as supply conditions improve further, confidence continues to recover, and firms work off large order backlogs. Rising wages and falling energy prices will partly offset the loss of purchasing power that many households are experiencing as a result of high inflation. This, in turn, will support consumer spending. Moreover, the labour market remains strong, despite the weakening of economic activity. Employment grew by 0.3% in the fourth quarter of 2022 and the unemployment rate stayed at its historical low of 6.6% in January 2023.

With energy supplies becoming more secure, energy prices have eased significantly, confidence has improved and activity should pick up somewhat in the short term. Lower energy prices are now providing some cost relief, particularly for energy-intensive industries, and global supply bottlenecks have largely dispersed. The energy market is expected to continue rebalancing and real incomes are expected to improve. With foreign demand also strengthening, and provided current financial market tensions subside, output growth is expected to rebound as of mid-2023, underpinned by a robust labour market. Nevertheless, the ECB's ongoing policy normalisation and further rate hikes expected by markets will increasingly feed through to the real economy, with additional dampening effects stemming from a recent tightening in credit supply conditions. This, together with the gradual withdrawal of fiscal support and some remaining concerns about risks to the energy

supply next winter, will weigh on economic growth in the medium term. Overall, annual average real GDP growth is expected to slow to 1.0% in 2023 (from 3.6% in 2022), before rebounding to 1.6% in 2024 and 2025. Compared with the December 2022 Eurosystem staff macroeconomic projections, the outlook for GDP growth has been revised up by 0.5 percentage points for 2023 owing to a carry-over from the positive surprises in the second half of 2022 and an improved short-term outlook. For 2024 and 2025, it has been revised down by 0.3 percentage points and 0.2 percentage points respectively, as the tightening of financing conditions and the recent appreciation of the euro outweigh the positive income and confidence effects of lower inflation.

According to ECB staff March 2023 projections, the euro area fiscal outlook is set to improve over the projection horizon. After the significant decline estimated for 2022, the euro area budget deficit is projected to continue to decline somewhat in 2023 and more significantly in 2024 (to 2.4% of GDP), remaining unchanged in 2025. The decline in the budget balance at the end of the projection horizon, compared with 2022, is explained by the improvement in the cyclically adjusted primary balance and by a better cyclical component, while interest payments gradually increase as a share of GDP over the projection horizon. Euro area debt is projected to continue to decline, albeit more slowly after 2022, to slightly below 87% of GDP by 2025. This is mainly on account of negative interest rate-growth differentials, which more than offset the persisting primary deficits. Nevertheless, in 2025, both the deficit and the debt ratios are expected to remain above pre-pandemic levels. Compared with the December projections, the budget balance path has been revised up over 2023-25, albeit only marginally at the end of the projection horizon, while interest payments have increased over 2024-25. The debt ratio has been revised down, reflecting mainly the improvement in the primary balance path.

Government support measures to shield the economy from the impact of high energy prices should be temporary, targeted and tailored to preserving incentives to consume less energy. As energy prices fall and risks around the energy supply recede, it is important to start rolling back these measures promptly and in a concerted manner. Measures falling short of these principles are likely to drive up medium-term inflationary pressures, which would call for a stronger monetary policy response. Moreover, in line with the EU's economic governance framework and as stated in the European Commission's guidance of 8 March 2023, 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 help reduce price pressures in the medium term. To that end, governments should swiftly implement their investment and structural reform plans under the Next Generation EU programme. The reform of the EU's economic governance framework should be concluded rapidly.

Inflation

Inflation edged down to 8.5% in February. The decline resulted from a renewed sharp drop in energy prices. By contrast, food price inflation increased further, to

15.0%, with the past surge in the cost of energy and of other inputs for food production still feeding through to consumer prices.

Moreover, underlying price pressures remain strong. Inflation excluding energy and food increased to 5.6% in February and other indicators of underlying inflation have also stayed high. Non-energy industrial goods inflation rose to 6.8% in February, mainly reflecting the delayed effects of past supply bottlenecks and high energy prices. Services inflation, which rose to 4.8% in February, is also still being driven by the gradual pass-through of past energy cost increases, pent-up demand from the reopening of the economy and rising wages.

Wage pressures have strengthened on the back of robust labour markets and employees aiming to recoup some of the purchasing power lost owing to high inflation. Moreover, many firms were able to raise their profit margins in sectors faced with constrained supply and resurgent demand. At the same time, most measures of longer-term inflation expectations currently stand at around 2%, although they warrant continued monitoring, especially in light of recent volatility in market-based inflation expectations.

The sharp adjustment in energy markets has led to a significant decline in price pressures, and inflation is now expected to fall at a faster pace. Energy inflation, which peaked above 40% last autumn, should turn negative in the second half of 2023 on the back of commodity prices falling below levels last seen before Russia's invasion of Ukraine, strong base effects and the stronger euro exchange rate. The more benign energy commodity price outlook implies fiscal measures should play a somewhat lesser role in lowering energy prices in 2023 and, with the withdrawal of the measures, a smaller rebound is now expected in energy inflation in 2024.

Inflation rates for other components of the Harmonised Index of Consumer Prices (HICP) are expected to start unwinding slightly later, as pipeline pressures related to cost pass-through, especially for food inflation, as well as lingering effects from past supply bottlenecks and the reopening of the economy, will still be present in the near term. Headline inflation is expected to fall below 3.0% by the end of 2023 and to stabilise at 2.9% in 2024, before moderating further to the inflation target of 2.0% in the third quarter of 2025 while averaging 2.1% for the year. In contrast to headline inflation, core inflation as measured by HICP inflation excluding energy and food will, on average, be higher in 2023 than in 2022, reflecting lagged effects related to indirect effects both from past high energy prices and from the past strong depreciation of the euro, which will dominate in the short term. The effects on core inflation from the more recent energy price declines and the euro's recent appreciation will be felt only later in the projection horizon. The expected decline in inflation in the medium term also reflects the gradual impact of monetary policy normalisation. Nevertheless, tight labour markets and inflation compensation effects imply that wages are expected to grow at rates well above historical averages and, by the end of the horizon, stand in real terms at levels close to those of the first quarter of 2022. Compared with the December 2022 projections, headline inflation has been revised down across the projection horizon (by 1.0 percentage point for 2023, by 0.5 percentage points for 2024 and by 0.2 percentage points for 2025). The sizeable downward revision for 2023 is driven by large downward surprises related

to energy inflation in recent months and much lower energy price assumptions, partially offset by upward data surprises for HICP inflation excluding energy and food. For 2024 and 2025, the downward revisions relate to a lower impact on energy inflation from the reversal of fiscal measures, more strongly fading indirect effects and an increasing pass-through of the euro's recent appreciation.

Risk assessment

Risks to the outlook for economic growth are tilted to the downside. Persistently elevated financial market tensions could tighten broader credit conditions more strongly than expected and dampen confidence. Russia's unjustified war against Ukraine and its people continues to be a significant downside risk to the economy and could again push up the costs of energy and food. There could also be an additional drag on euro area growth if the world economy weakened more sharply than expected. However, companies could adapt more quickly to the challenging international environment and, together with the fading-out of the energy shock, this could support higher growth than currently expected.

The upside risks to inflation include existing pipeline pressures that could still send retail prices even higher than expected in the near term. Domestic factors, such as a persistent rise in inflation expectations above the Governing Council's target or higher than anticipated increases in wages and profit margins, could drive inflation higher, including over the medium term. Moreover, a stronger than expected economic rebound in China could give a fresh boost to commodity prices and foreign demand. The downside risks to inflation include persistently elevated financial market tensions that could accelerate disinflation. In addition, falling energy prices could translate into reduced pressure from underlying inflation and wages. A weakening of demand, including owing to a stronger deceleration of bank credit or a stronger than projected transmission of monetary policy, would also contribute to lower price pressures than currently anticipated, especially over the medium term.

Financial and monetary conditions

Market interest rates rose considerably in the weeks following the Governing Council's February meeting. But the increase reversed strongly in the run-up to the March meeting in a context of severe financial market tensions. Bank credit to euro area firms has become more expensive. Credit to firms has weakened further, owing to lower demand and tighter credit supply conditions. Household borrowing has become more expensive as well, especially owing to higher mortgage rates. This rise in borrowing costs and the resultant decline in demand, along with tighter credit standards, have led to a further slowdown in the growth of loans to households. Amid these weaker loan dynamics, money growth has slowed sharply, driven by its most liquid components.

Monetary policy decisions

Based on its current assessment, the Governing Council decided to raise the three key ECB interest rates by 50 basis points. Accordingly, the interest rate on the main refinancing operations and the interest rates on the marginal lending facility and the deposit facility will be increased to 3.50%, 3.75% and 3.00% respectively, with effect from 22 March 2023.

The asset purchase programme (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 and its subsequent pace will be determined over time. 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, inflation is projected to remain too high for too long. Therefore, at its March meeting, the Governing Council decided to increase the three key ECB interest rates by 50 basis points, in line with its determination to ensure the timely return of inflation to the 2% medium-term target.

The elevated level of uncertainty reinforces the importance of a data-dependent approach to policy rate decisions, which will be determined by 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 Governing Council stands ready to adjust all of its instruments within its mandate to ensure that inflation returns to its 2% target over the medium term and to preserve the smooth functioning of monetary policy transmission.

1 External environment

Global economic activity remained subdued at the turn of the year, but near-term prospects have brightened, helped by China's economic reopening and still resilient labour markets across advanced economies. The easing of supply constraints continues to support global trade. Despite headline inflation declining, underlying price pressures remain strong. Against this backdrop, the global growth outlook for 2023 and 2024, as embedded in the March 2023 ECB staff macroeconomic projections for the euro area, has been revised upwards compared with the December 2022 Eurosystem staff macroeconomic projections for the euro area. While the reopening of China's economy will bolster global growth this year, world economic activity remains relatively muted, with growth rates remaining below historical averages over the whole projection horizon from 2023 to 2025. Global trade projections have also been revised upwards to reflect China's economic reopening and the further easing of global supply chain constraints. There are growing signs that global consumer price index (CPI) inflation had already peaked in 2022, although price pressures in the global economy remain high. Disinflation is being supported by waning supply disruptions, falling energy prices and synchronised monetary policy tightening across the globe. However, resilient labour markets and strong wage growth, especially in major advanced economies, suggest that underlying inflationary pressures in the global economy remain strong.

High inflation, monetary policy tightening and the pandemic-related supply disruptions in China dampened global growth at the turn of the year. Together with the heightened geopolitical uncertainty related to the war in Ukraine and lingering supply risks for global energy and food commodity markets, these factors weighed on economic activity, with global real GDP growth decreasing sharply to an estimated 0.4% in the fourth quarter of 2022.[1] While this was broadly in line with the December 2022 projections, two opposing forces have been at play. First, the abrupt lifting of the public health containment policies in China triggered a sharp increase in COVID-19 infection rates, pointing, in the short term, to much weaker economic activity than had been previously expected. Second, real GDP growth in the United States came in stronger than anticipated, owing to a large positive contribution from net exports and inventories, although domestic demand moderated further.

Global real GDP growth is expected to increase in the first quarter of 2023 but remains subdued. The increase reflects the fact that the recent pandemic-related disruptions in China appear to be abating already and that labour market performance in advanced economies remains strong. It is also in line with the indications derived from the latest Purchasing Managers' Index (PMI) surveys, which suggest an improvement in economic activity. Across advanced economies, services sector output has risen recently alongside ongoing labour market resilience, while manufacturing output remains in contractionary territory (Chart 1, panel a). In China, recovery from the disruptions is well under way, with the outputs from both

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[1]   Given the focus of this section on developments in the global environment, all references to world and/or global aggregate economic indicators exclude the euro area.

manufacturing and the services sector rebounding quickly in February, lifting emerging market aggregates (Chart 1, panel b).

Chart 1

Purchasing Managers' Index output by sector across advanced and emerging market economies

a) Advanced economies (excluding the euro area)

(diffusion indices)
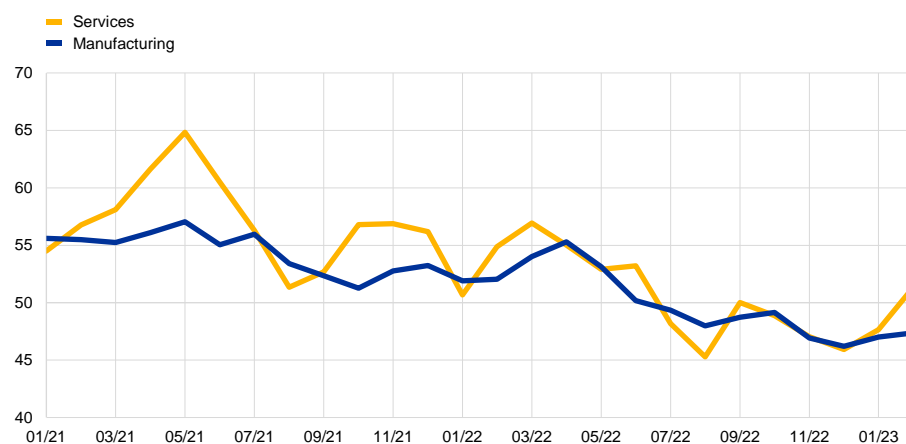
b) Emerging market economies

(diffusion indices)
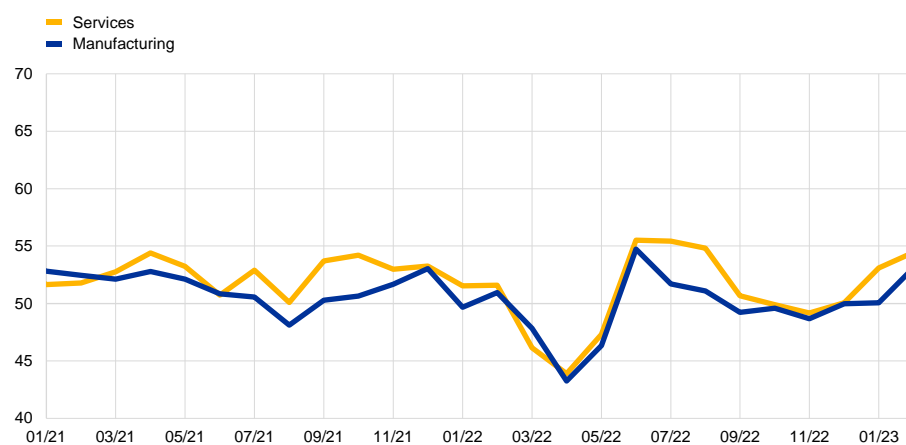
Sources: S&P Global Market Intelligence and ECB staff calculations.
Note: The latest observations are for February 2023.

The global growth outlook has been revised upwards for 2023 and 2024. While the economic reopening in China will support global growth in 2023, world economic activity remains sluggish, with growth rates over the projection horizon still below historical averages. According to the March 2023 projections, global real GDP growth is projected to be 3.0% in 2023, slightly below the growth rate of 3.3% estimated for 2022, before increasing very gradually to 3.2% in 2024 and 3.3% in 2025. Compared with the December 2022 projections, this represents upward revisions for 2023 (by 0.4 percentage points) and 2024 (by 0.1 percentage points), but no change for 2025. A key factor behind the revisions is the improved outlook in China, with the pandemic-related disruptions seen at the turn of the year expected to pave the way for a faster recovery later in 2023, given that the Chinese economy will

be less constrained by the risk of renewed lockdowns. Real GDP growth in the United States has also been revised upwards against the backdrop of continued labour market resilience. For advanced economies, the projected path of real GDP growth remains relatively subdued for 2023, broadly in line with the December 2022 projections, and is expected to recover only gradually thereafter. For emerging market economies, broadly stable growth rates of around 4% are projected over the projection horizon as a whole.

World trade projections have also been revised upwards to reflect China's economic reopening and the further easing of global supply chain constraints. This comes after negative growth in the fourth quarter of 2022, when world trade is estimated to have declined owing to weaker trade in goods across advanced and emerging market economies. Since then, there have been tentative signs of stabilisation at a low level. Although the global PMI new exports orders index for manufacturing remains in contractionary territory, it improved in both January and February 2023. In addition, global supply constraints have eased significantly and suppliers' delivery times have shortened, suggesting that the impact of pandemic-related disruptions in China on global supply chains was relatively limited and short-lived (Chart 2). The expectation in the March 2023 projections is for world trade growth to be less dynamic than global real GDP growth this year, reflecting the continued diminishing impact of the unwinding of supply bottlenecks that contributed to strong trade growth in 2022. As consumption patterns, especially in advanced economies, normalise and rotate back to services and away from goods, global trade might be negatively affected. World trade is projected to grow by 2.5% in 2023 – a relatively subdued pace compared with historical averages – and to increase by 3.4% in 2024 and in 2025, broadly in line with global real GDP growth. Euro area foreign demand is expected to follow a similar path. The March 2023 projections point to euro area foreign demand increasing by 2.1% in 2023, before rising to 3.1% in 2024 and 3.3% in 2025. The projections for both world trade and euro area foreign demand have been revised upwards for 2023, owing in part to stronger than anticipated outturns in the third quarter of 2022 that resulted in sizeable statistical carry-over effects.

Chart 2

Purchasing Managers' Index suppliers' delivery times
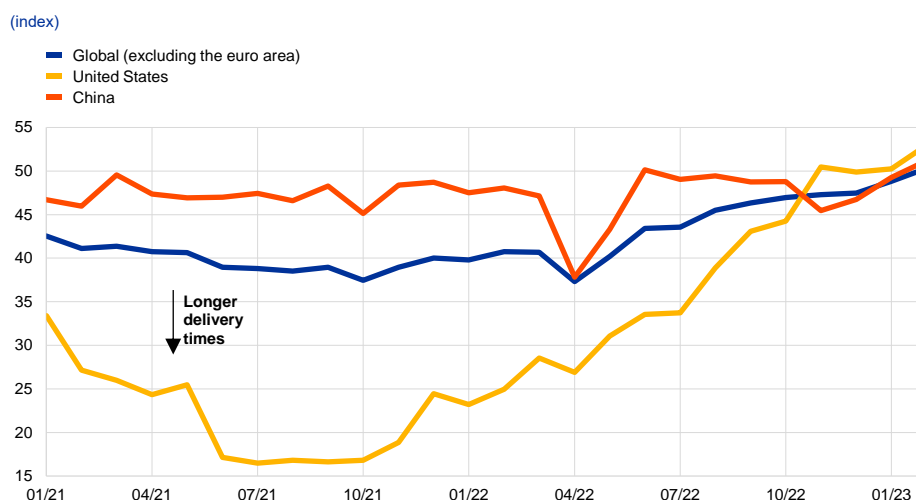
(index)

- Global (excluding the euro area)
- United States
- China

Longer
delivery
times

Sources: S&P Global Market Intelligence and ECB staff calculations.
Note: The latest observations are for February 2023.

Price pressures in the global economy remain high. Global CPI inflation has been declining since it peaked in summer 2022, owing to waning supply disruptions, falling energy prices and synchronised monetary policy tightening. However, resilient labour markets and strong wage growth, especially in advanced economies, suggest that underlying inflationary pressures are strong. Annual headline CPI inflation across the member countries of the Organisation for Economic Co-operation and Development (OECD) decreased slightly to 9.2% in January 2023, down from 9.4% in the previous month. Inflation momentum for headline CPI inflation is declining sharply owing to falling energy prices (Chart 3, panel a). By contrast, core CPI inflation (which excludes food and energy components) remained unchanged at 7.2% over the same period, and, although its momentum has slowed somewhat, it remains relatively strong, suggesting more persistent inflationary pressures (Chart 3, panel b). The projected path of euro area competitor export prices also reflects this narrative and has been revised slightly downwards compared with the December 2022 projections.

Chart 3

Consumer price index inflation in the OECD area

a) Headline

(year-on-year percentage changes and three-month-on-three-month annualised percentage changes)

- Annual growth
- Annualised three-month-on-three-month growth

b) Core

(year-on-year percentage changes and three-month-on-three-month annualised percentage changes)

- Annual growth
- Annualised three-month-on-three-month growth
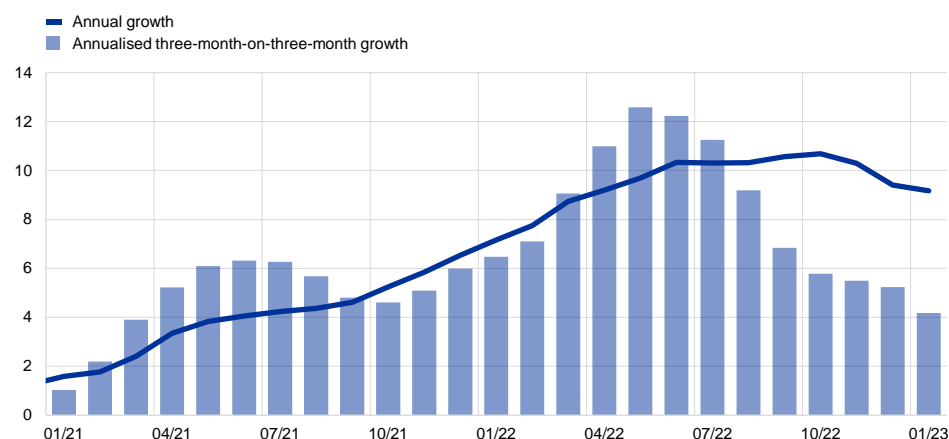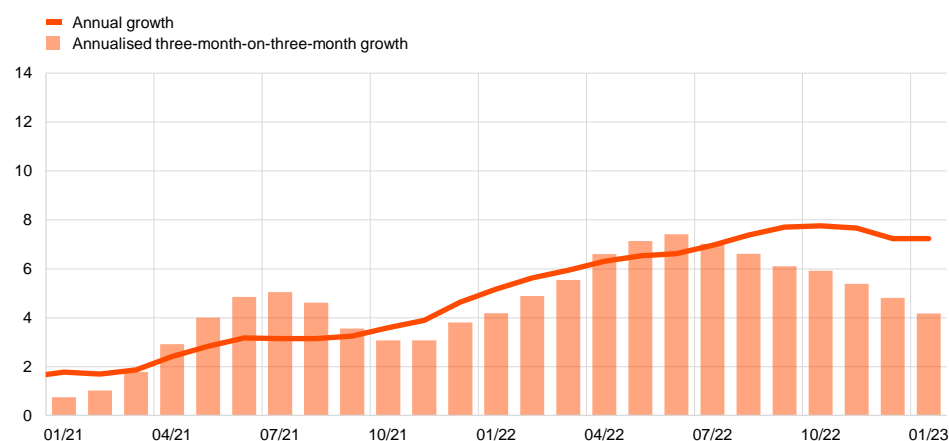
Sources: OECD and ECB calculations.
Notes: Core CPI inflation excludes energy and food components. The patterns of annual headline and core CPI inflation, and their respective inflation momentums, would be similar even if Türkiye (where inflation remains in high double digits) were to be excluded from the OECD aggregate. In January 2023 annual headline and core CPI inflation for OECD countries excluding Türkiye (not shown in the panels) stood at 7.5% and 5.7% respectively, compared with 7.6% and 5.6% in December 2022. The latest observations are for January 2023.

Global oil prices have declined, and European gas prices have fallen sharply but remain well above levels before the Russia-Ukraine war. A successful substitution of gas imports from Russia with liquified natural gas imports over the course of 2022 helped to build up gas inventories in Europe ahead of the winter. Their levels have also remained high, owing to lower demand as a result of a very mild winter and effective gas-saving measures. Furthermore, the current high gas inventory levels leave Europe in a better position ahead of next winter compared with last year. However, upside risks to gas prices remain, owing to the possibility of (i) Chinese demand for liquified natural gas imports being stronger than currently expected, and (ii) Russia cutting the remaining gas supplies to Europe later this year. With regard to oil, the drop in prices reflects weaker global demand and growing concerns about future oil demand in the wake of the financial market tensions

emanating from the US banking sector. It also reflects the thus far relatively limited effect on global oil supplies of the latest sanctions imposed on Russia, which has only been partly offset by the impact of China's economic reopening. Furthermore, global oil supplies have been bolstered by higher production in Kazakhstan and Nigeria. However, upside risks to global oil prices remain given the possibility of a lower supply of oil from Russia, despite the ongoing diversion of its oil exports from Europe to China and India. In response to the sanctions, Russia announced a 5% cut in its crude oil production.

Global risk sentiment remains volatile. This volatility has increased further more recently against the backdrop of significant financial market tensions triggered by bank failures in the United States. Global financial markets, and stock market valuations in particular, were initially buoyed by the optimism generated by the reopening of the Chinese economy, moderating energy prices and early signs of easing inflationary pressures. However, their performance has been mixed more recently given signs that underlying inflationary pressures in the global economy remain strong, owing to the continuing strong performance of labour markets and high wage growth. This has led market participants to revise their expectations about monetary policy actions in major advanced economies, which is also weighing on global risk sentiment.

In the United States, economic activity is projected to slow in the first half of this year, while disinflation is likely to be more gradual than expected. Real GDP growth in the fourth quarter of 2022 increased by 0.8% in quarterly terms, driven by strong inventory investment, while domestic demand continued to cool. Recent indicators point to modest growth in consumer spending, in part reflecting tighter financial conditions over the past year. Moreover, housing sector activity continues to weaken, largely as a result of rising mortgage rates. Higher interest rates and slower output growth also appear to be weighing on business fixed investment. Looking ahead, the continuing slowdown in domestic demand points to weak growth in the first half of the year, even with moderating inflation and strong labour markets. Despite this slower growth, the labour market remains very tight, with few signs of easing, and nominal wage growth is still high, supporting the view that inflation in the United States might be more persistent than anticipated. Annual headline CPI inflation fell to 6.0% in February 2023, owing to a decline in food and energy prices, and annual core CPI inflation dropped slightly to 5.5%. While the financial market tensions triggered by bank failures could further weigh on growth in the US economy, their impact remains largely uncertain.

In China, recovery from the recent pandemic-related disruptions is well under way. Quarter-on-quarter real GDP growth remained unchanged in the fourth quarter of 2022, following the sudden decision by the authorities to abandon the dynamic zero-COVID strategy, which initially resulted in a large increase in COVID-19 infection rates. However, as that wave of infections continues to ebb, economic activity is expected to rebound already in the first quarter of 2023, and to do so more strongly from the second quarter as the pandemic-related constraints wane. This is supported by the large rise in mobility and congestion seen in major cities, although other indicators tracking economic activity, such as those relating to coal prices and

air quality, have recovered more moderately thus far. Outbound Chinese tourism is reportedly also picking up. Meanwhile, the real estate sector is showing only a mild recovery. This is explained by the lingering effect on confidence around the purchase of big-ticket items generated by the pandemic and by continued negative perceptions of the viability of private real estate developers. Against this backdrop, the growth outlook for China has been revised upwards for 2023 and is expected to reach average growth rates similar to the "at around 5%" target recently announced by the Government. Inflationary pressures in China remain moderate and are not expected to increase significantly as the economy reopens.

In Japan, real GDP growth was flat in the fourth quarter of 2022 amid relatively weak domestic demand. This outturn was weaker than expected, with a more dynamic recovery having generally been expected given that growth had contracted in the third quarter. For 2023, economic activity is projected to increase gradually, supported by pent-up demand, China's economic reopening and continued monetary and fiscal support. In January, annual headline CPI inflation rose to 4.3%. In the near term, inflation is expected to moderate, owing to favourable base effects from last year's higher energy and food prices, and to the extension of the Government's energy subsidies.

In the United Kingdom, economic activity is expected to remain weak in the first half of 2023. After the economy had narrowly avoided a technical recession late last year, growth momentum at the turn of the year was negative. This, together with weak readings for short-term indicators, suggests that growth could turn negative again in the first quarter, given that those indicators point to prolonged weakness in growth momentum and that households continue to be faced with falling real wages and tighter financial conditions. In January annual headline CPI inflation declined to 10.1%, reflecting lower fuel prices, and core inflation showed the first signs of easing thanks to lower inflation for hospitality services. However, given that the labour market remains tight and wages are increasing strongly, inflationary pressures are also expected to be more persistent in the UK economy, despite a weak growth performance.

2 Economic activity

In 2022 euro area real GDP grew by 3.5% and by the end of the year was 2.4% above its pre-pandemic level. However, this outcome masked a significant slowdown in activity in the second half of 2022, reflecting the fading effect of factors that had supported the economy earlier in the year, notably the strong rebound in demand for contact-intensive services after the easing of COVID-19-related restrictions. In addition, soaring energy prices had a negative impact on spending and production. Economic activity in the euro area stagnated in the last quarter of 2022 as a result of offsetting factors. While net trade had a large positive impact on growth, all private domestic demand components contracted amid declining real disposable income, lingering uncertainty and tighter financing conditions. The euro area economy is expected to start on a gradual recovery path in early 2023 as incoming survey data point to some uptick in activity and confidence. More secure energy supplies, significantly lower energy prices, the easing of supply chain issues and government support should continue to provide some relief for households and industries in the coming quarters. Over the medium term a robust labour market, improving confidence and a recovery in real incomes should support a rebound in euro area GDP growth, but the gradual tightening of financing conditions is expected to have a dampening effect on activity.

This assessment is broadly reflected in the baseline scenario of the March 2023 ECB staff macroeconomic projections for the euro area. Annual real GDP growth is expected to slow to 1.0% in 2023 before rebounding to 1.6% in 2024 and 2025. Compared with the December 2022 Eurosystem staff macroeconomic projections for the euro area, the outlook has been revised up by 0.5 percentage points in 2023 and revised down by 0.3 percentage points in 2024 and 0.2 percentage points in 2025. Given that the projections were finalised in early March before the recent emergence of financial market tensions, this outlook is surrounded by additional uncertainty.

Euro area activity stagnated in the fourth quarter of 2022. The expenditure breakdown shows a strong negative contribution from domestic demand, with both private consumption and investment seeing a marked decline (Chart 4). However, this was offset by a positive contribution from net trade due to sluggish exports and declining imports. While the dynamics of investment and imports in the last quarter of 2022 were affected by volatile developments in Ireland, the contraction in private domestic demand suggests very weak underlying growth dynamics at the end of the year. This last quarterly outcome brought euro area annual real GDP growth to 3.5% in 2022, with a carry-over to growth in 2023 estimated at 0.4%, slightly below the historical average.

Chart 4

Euro area real GDP and its components

(quarter-on-quarter percentage changes; percentage point contributions)
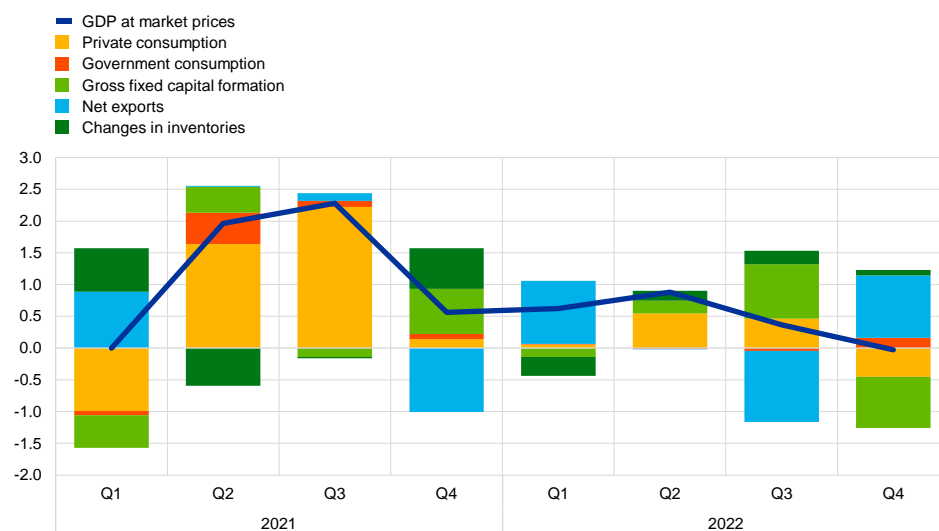
- GDP at market prices
- Private consumption
- Government consumption
- Gross fixed capital formation
- Net exports
- Changes in inventories

Sources: Eurostat and ECB calculations.
Note: The latest observations are for the fourth quarter of 2022.

Euro area GDP growth is expected to turn slightly positive in the first quarter of 2023, with mixed signals from the most recent economic indicators.
Incoming survey data suggest that the euro area economy may have expanded modestly in the first quarter of the year. The composite output Purchasing Managers' Index (PMI) for the euro area increased further in February to reach a nine-month high and is now broadly in line with its long-run average. This upturn was driven mostly by business activity in the services sector (Chart 5, panel a). The persistently strong activity in contact-intensive services in early 2023 points to some lingering effects from the reopening of the economy. The manufacturing output index rose above 50 in February, signalling growth for the first time since May 2022. The manufacturing industry benefited from an easing of supply chain issues, as reflected in the strong decrease in the suppliers' delivery times indicator in February. Nevertheless, weak demand conditions continued to weigh on manufacturing production, which recently has been mostly relying on the backlog of orders.

Both the manufacturing and services sectors appear to have been supported by a continued improvement in confidence in early 2023, but it is unclear to what extent the recent financial market tensions may dampen confidence in the future. The European Commission's Economic Sentiment Indicator remained broadly stable in February following a notable improvement in January but is still at a historically low level. Moreover, its stability masks some reversal in sentiment for industry and services compensated only by improved confidence in the construction and retail sectors (Chart 5, panel b). Consumer confidence continued its recovery in February, rising for the fourth consecutive month, although the index remains well below its long-term average and below the level reached prior to the war in Ukraine. Survey results also show that in recent months households have started to be less concerned about high energy prices and uncertainty about their financial situation has declined. This is providing signs of a gradual recovery in consumer spending

despite the likely adverse impact of still high inflation and rising interest rates and possibly of the recent financial market tensions.

Chart 5

Survey-based indicators across sectors of the economy

(left-hand panel: percentage balances; right-hand panel: percentage balances, February 2020=100)

- Manufacturing output
- Services
- Contact-intensive services
- Industry excluding construction
- Services
- Construction
- Consumer confidence
- Retail

a) PMI indicators

b) Confidence indicators
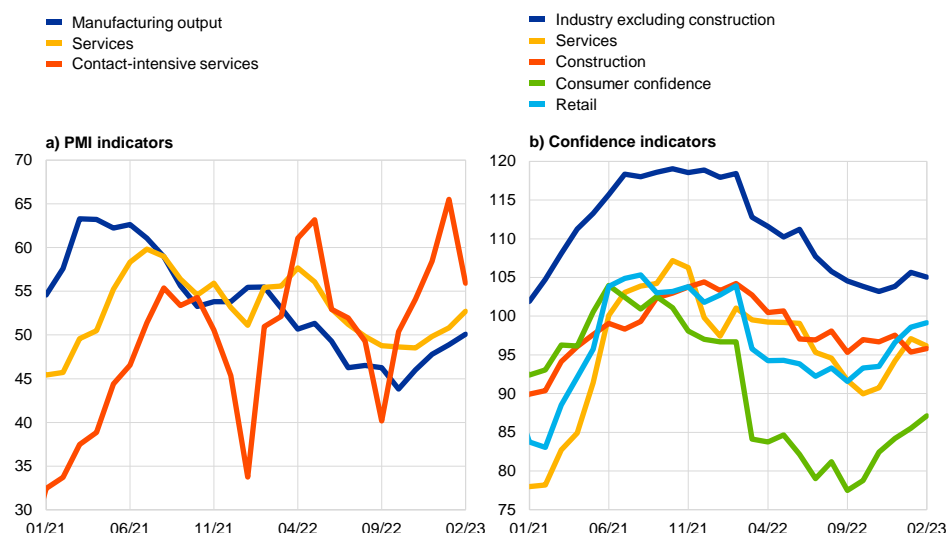
Sources: S&P Global, European Commission and ECB calculations.
Note: The latest observations are for January 2023 for contact-intensive services and February 2023 for all other items.

The labour market continued to expand in the fourth quarter of 2022 and remained resilient to the stagnation in GDP growth. Employment increased by 0.3% in the fourth quarter of 2022 and total hours worked increased by 0.4%. Since the fourth quarter of 2019 employment has increased by 2.3% and total hours worked have risen by 0.6% (Chart 6). This represents a 1.7% decline in average hours worked. Part of this decline is related to the strong employment creation in the public sector since the fourth quarter of 2019, which on average exhibits lower average hours worked compared with the total economy. The labour force has grown significantly compared with the fourth quarter of 2019. The unemployment rate was 6.6% in January and has remained broadly stable since April 2022. Labour demand remains strong, with the job vacancy rate stable at 3.2%, the highest level since the start of the series and one percentage point higher than in the fourth quarter of 2019.

Chart 6

Euro area employment, the PMI assessment of employment 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)
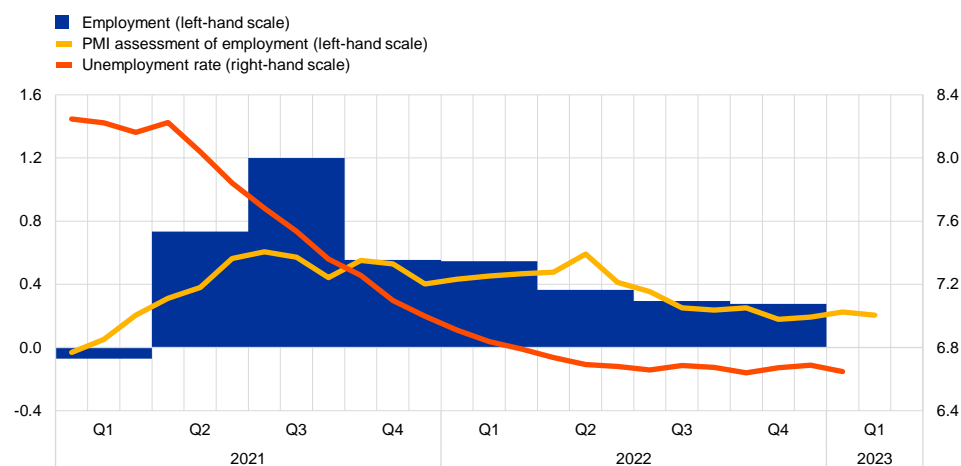
Sources: Eurostat, S&P Global Market Intelligence and ECB calculations.
Notes: The two lines indicate monthly developments, while the bars show quarterly data. The PMI is expressed in terms of the deviation from 50 divided by 10. The latest observations are for the fourth quarter of 2022 for employment, February 2023 for the PMI assessment of employment and January 2023 for the unemployment rate.

Short-term labour market indicators point to continued employment growth in the first quarter of 2023. The monthly composite PMI employment indicator declined from 52.3 in January to 52.0 in February, remaining above the threshold of 50 that indicates an expansion in employment. This indicator has been in expansionary territory since February 2021 but has fallen significantly since May 2022, suggesting decelerating employment growth. Looking at developments across different sectors, the indicator points to continued employment growth in the industry and services sectors and to broad stabilisation in the construction sector.

Private consumption contracted in the fourth quarter of last year, driven by declining real disposable income and lingering uncertainty. Despite the favourable effects of a still resilient labour market and fiscal support, elevated inflation weighed on real disposable income in the last quarter of 2022. Against this background, after three quarters of positive dynamics, private consumption contracted by 0.9% in the last quarter of 2022, reflecting divergent developments in individual components. Consumption of non-durable goods contracted sharply at the end of last year, reflecting developments in retail sales (-1.1%, quarter-on-quarter, in the fourth quarter of 2022). Spending on services declined marginally, still benefiting somewhat from lingering reopening effects. By contrast, consumption of durable goods continued to increase for the second quarter in a row, benefiting from easing supply disruptions in the vehicle sector and government incentives for the purchase of all-electric or plug-in hybrid vehicles in Germany. Mirroring this, new passenger car registrations increased by 8.0% in the fourth quarter of last year but fell back by 7.1% month-on-month in January owing to the expiration of these incentives. Despite persistent headwinds, incoming data provide some signs of a gradual recovery in consumer spending in the first half of 2023. Retail sales increased by 0.3% month-on-month in January and households have revised down their inflation expectations

in recent months (Chart 7, left-hand panel), while uncertainty about their financial situation has declined. The European Commission's consumer confidence indicator continued to recover in February supported mainly by improving expectations about the general economic outlook and households' own financial situation (Chart 7, right-hand panel). The Commission's latest consumer and business surveys also indicate that expected demand for accommodation, food and travel services increased further in February alongside persistent improvements in retailers' forward-looking demand expectations. The use of savings should also help to smooth out consumption to some extent in the face of weak real disposable income, despite the opportunity cost of holding money amid rising interest rates and the ongoing tightening of household loan conditions.

Chart 7

Household expectations
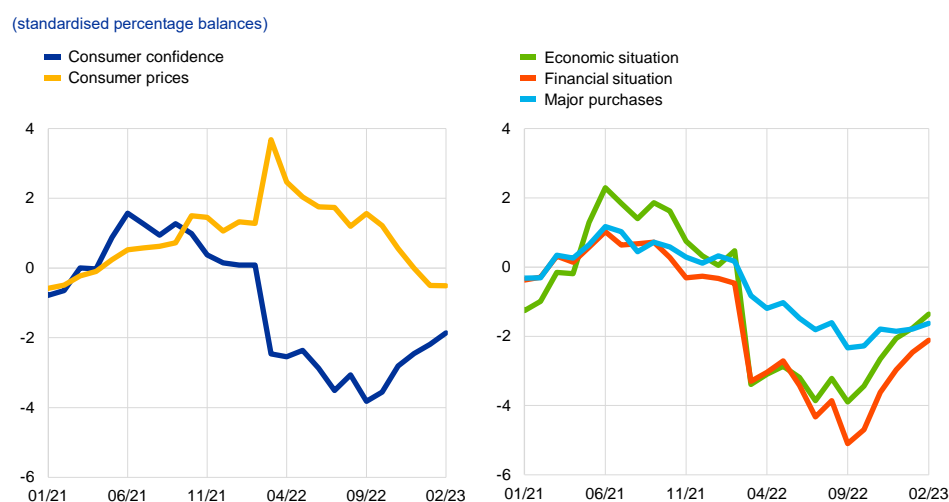
(standardised percentage balances)

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

Business investment contracted in the fourth quarter of 2022 and is expected to remain weak in the first half of 2023. Non-construction investment (the closest proxy for business investment in the national accounts) fell strongly in the final quarter of 2022 – by 5.8% quarter-on-quarter – after an upward revision to its growth of 8.4% in the third quarter. However, most of the strong volatility observed in these quarters reflects a renewed episode of erratic developments in intellectual property investment related mainly to the Irish multinational sector.[2] Excluding this volatile component, business investment contracted by 0.3% in the final quarter following growth of 1.9% in the third quarter. The fourth quarter decline was driven by a marked contraction in the machinery and equipment sector, where investment in both transport and non-transport machinery and equipment fell abruptly. Incoming data for the first quarter of 2023 suggest ongoing weakness in business investment over the coming months given the high remaining uncertainty, sluggish orders and rising financing costs. The PMI output indicator for the capital goods sector bounced

[2]   Occasionally, the high statistical volatility of intangible investment in Ireland considerably affects euro area investment dynamics. For more details, see box 1 "Non-construction investment in the euro area and the United States" in the article entitled "The recovery in business investment – drivers, opportunities, challenges and risks", *Economic Bulletin*, Issue 5, ECB, 2022.

back into growth territory in February, bringing the quarterly average above the theoretical no-growth threshold for the first time since the second quarter of 2022, while outstanding business in the sector looks also to have improved following a sharp decline in the last quarter of 2022. However, the same source suggests new orders in the sector remain in negative territory, while capacity utilisation has been falling strongly since the summer. The Commission's industrial confidence indicator for the capital goods sector for February 2023 remained around a full standard deviation below the level it had reached prior to the Russian invasion of Ukraine, while the broader, investor-based Sentix overall economic index also remains well below its long-term average. Together with steeply increasing financing costs, these continuing mixed signals suggest business investment can be expected to remain weak in the coming quarters.

Housing investment declined significantly in the fourth quarter of 2022 and is expected to contract further in the near term. Housing investment declined by 1.6% in the fourth quarter following a 1.1% quarter-on-quarter drop in the third quarter. Building construction output was largely unchanged on average in the fourth quarter, but fell sharply in December, suggesting a weak starting point for the first quarter of 2023. Moreover, the Commission's indicator of construction activity over the past three months declined markedly on average in January and February compared with the fourth quarter average. In addition, despite some improvement, the PMI for residential construction remained in contractionary territory. Supply constraints appear to be gradually easing further. According to the Commission's monthly survey of limits to production for the construction sector, the share of construction firms pointing to material and/or equipment shortages continued to decline on average in January and February, as did the percentage of those indicating labour shortages, which nevertheless remained at a high level. However, the share of managers specifying insufficient demand as a factor limiting their building activity rose again compared with the fourth quarter average, indicating weakening demand. This information is in line with the low levels of the new orders component of the construction PMI, although households' short-term intentions to renovate, buy or build a home have stabilised. Overall, housing demand is likely to weaken further against a backdrop of a significant deterioration in financing conditions and significantly increased construction costs, thus further depressing housing investment in the future.

Euro area export volumes growth continued to be sluggish around the turn of the year due to subdued global foreign demand. Initial estimates point to modest growth in real goods exports on a quarter-on-quarter basis in December, as global foreign demand weakened. At the same time, monthly data point to a sharp drop in production for energy-intensive sectors (such as chemicals), suggesting that despite recent energy price reductions, the effects of still high energy costs continue to weigh on the prospects for production and exports. With import volumes contracting, net trade contributed positively to GDP growth in the fourth quarter. Falling energy prices were also behind a further improvement in the euro area terms of trade, which contributed to a sharp recovery in the current account in the fourth quarter of 2022. Forward-looking indicators point to continued near-term weakness in euro area export volumes. At the same time, supplier delivery times shortened in February,

which should ease the headwinds for euro area trade.[3] China's reopening should also support euro area exports in goods and services, including tourism, but the overall impact for euro area activity is expected to be modest. The PMI for new orders in the tourism sector rebounded strongly in January and February.

Beyond the near term, GDP growth is expected to gradually strengthen as uncertainty recedes and real incomes increase, despite tightening financing conditions. More secure energy supplies, significantly lower energy prices, the easing of supply chain issues and government support should continue to provide some relief for households and energy-intensive industries in the coming quarters. Industrial production should pick up as supply conditions improve further, confidence continues to recover and firms work off large order backlogs. Rising wages and falling energy prices should partly offset the loss of purchasing power that many households are experiencing as a result of high inflation. This, in turn, should support consumer spending. Over the medium term, a robust labour market, improving confidence and a recovery in real incomes should support a rebound in euro area GDP growth, but the gradual tightening of financing conditions is expected to have a dampening effect on activity.

The March 2023 ECB staff macroeconomic projections for the euro area foresee annual real GDP growth to slow to 1.0% in 2023 before rebounding to 1.6% in 2024 and 2025 (Chart 8). Compared with the December 2022 Eurosystem staff macroeconomic projections, real GDP growth has been revised up by 0.5 percentage points for 2023 and revised down by 0.3 percentage points for 2024 and by 0.2 percentage points for 2025. As the projections were finalised in early March before the recent emergence of financial market tensions, this outlook is surrounded by additional uncertainty.

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[3]   See the box entitled "Global value chains and COVID-19 - the impact of supply bottlenecks" in this issue of the Economic Bulletin.

Chart 8

Euro area real GDP (including projections)

(index: fourth quarter of 2019 = 100; seasonally and working day-adjusted quarterly data)

- March 2023 ECB staff macroeconomic projections
- December 2022 Eurosystem staff macroeconomic projections
- December 2021 Eurosystem staff macroeconomic projections
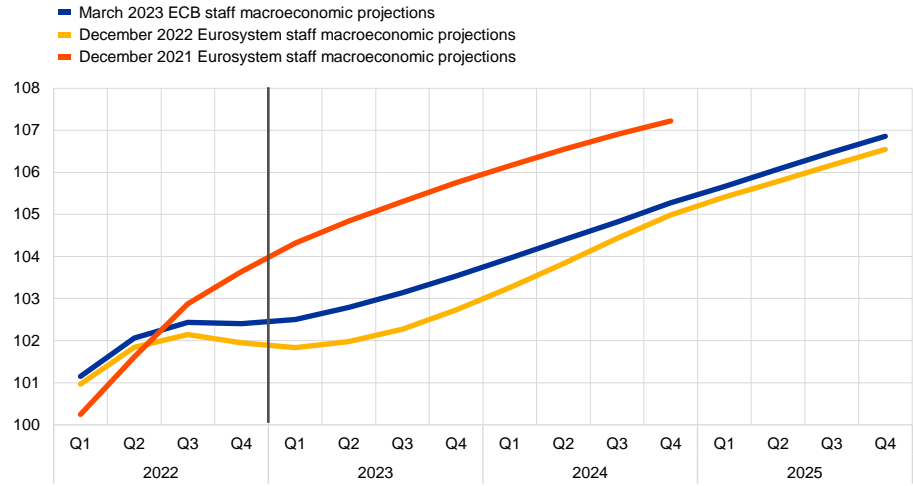
Sources: Eurostat and March 2023 ECB staff macroeconomic projections for the euro area.
Note: The vertical line indicates the start of the March 2023 ECB staff macroeconomic projections for the euro area.

3 Prices and costs

According to Eurostat's flash estimate, inflation in the euro area edged down to 8.5% in February, primarily reflecting a renewed sharp drop in energy prices. However, food price inflation and HICP inflation excluding energy and food rose further, with the past surge in the cost of energy and of other inputs, as well as the impacts of supply bottlenecks and of the reopening the economy, still feeding through to consumer prices with a delay. Headline inflation is expected to average 5.3% in 2023, according to the March 2023 ECB staff macroeconomic projections for the euro area, largely reflecting downward energy-related base effects, declines in energy prices and easing pipeline pressures.[4] Over the rest of the projection horizon, it is expected to decline further to 2.9% in 2024 and 2.1% in 2025. Inflation excluding energy and food is expected to stand at 4.6% in 2023, which is higher than foreseen in the December 2022 Eurosystem staff macroeconomic projections for the euro area. Subsequently, it is projected to come down to 2.5% in 2024 and 2.2% in 2025. Wage pressures have strengthened, and most measures of longer-term inflation expectations currently stand at around 2.0%, although they warrant continued monitoring, especially considering the recent volatility in market-based inflation expectations.

According to the Eurostat flash estimate, inflation as measured by the HICP decreased further to 8.5% in February, down slightly from 8.6% in January 2023. The decrease was driven by the annual rate of change in energy prices (13.7% in February, down from 18.9% in January), while the inflation rates for all the other components increased. The further increase in food inflation to 15% in February, up from 14.1% in January, reflected a further strengthening in the annual inflation rate for both processed and unprocessed food, but particularly for the latter. The strong food price dynamics continue to reflect the lagged effects of past increases in global food commodity prices and energy-related costs from mid-2021. However, the moderation of indicators such as euro area farm gate prices points to the possible normalisation of food inflation looking ahead (Chart 9).

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[4] The March 2023 ECB staff macroeconomic projections for the euro area were finalised in early March and the cut-off date for the technical assumptions was 15 February 2023.

Chart 9

Energy and food input cost pressure

(annual percentage changes)

- Producer price index – energy
- Euro area farm gate prices
- Producer price index – manufacture of food products (right-hand scale)
- HICP food (right-hand scale)
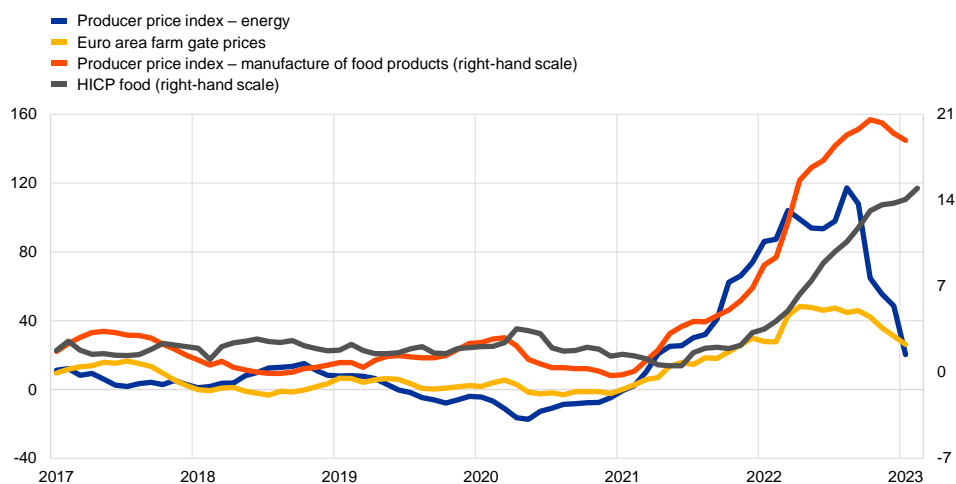
Source: Eurostat.
Notes: HICP stands for Harmonised Index of Consumer Prices. The latest observations are for February 2023 (flash estimate) for HICP food and January 2023 for the remaining items.

HICP inflation excluding energy and food (HICPX) increased further to 5.6% in February, up from 5.3% in January, driven by non-energy industrial goods (NEIG) and services inflation (Chart 10). The ongoing strength and the further increase in NEIG inflation continue to reflect the accumulated pipeline pressures from past supply bottlenecks and high energy costs. Services inflation rose strongly to 4.8% in February from 4.4% in January, with prices for contact-intensive sectors such as package holidays likely remaining a key driver. This is in line with demand pressures after the reopening of the economy, but as most of these services are also energy intensive, the surge in energy prices since mid-2021 is likely to have created additional upward cost pressures that are still feeding through.

Chart 10

Headline inflation and its main components

(annual percentage changes; percentage point contributions)
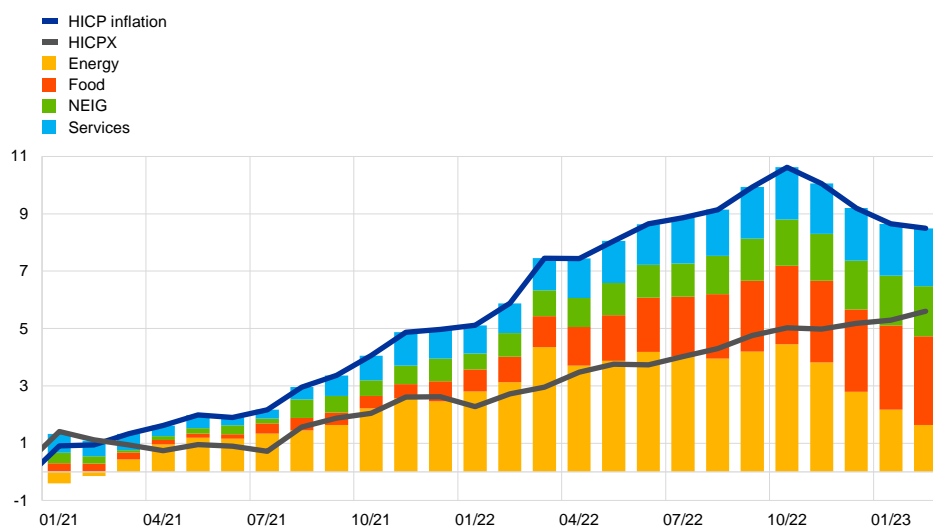
- HICP inflation
- HICPX
- Energy
- Food
- NEIG
- Services

Sources: Eurostat and ECB calculations.
Notes: HICP stands for Harmonised Index of Consumer Prices. HICPX stands for HICP inflation excluding energy and food. NEIG stands for non-energy industrial goods. The latest observations are for February 2023 (flash estimate).

Measures of underlying inflation remained at elevated levels and continued to give mixed signals (Chart 11).[5] While HICPX inflation increased further in February, other indicators of underlying inflation, which are currently only available up to January 2023, gave mixed signals. The Supercore indicator, which comprises HICP items sensitive to the business cycle, and the domestic inflation indicator, which comprises HICP items with a lower import content, continued to increase up to January. By contrast, the rate of change for the model-based Persistent and Common Component of Inflation (PCCI) (both including and excluding energy items) declined over the last few months leading up to January. This downward movement is in line with indications of a slowing momentum in HICPX dynamics, with three-month-on-three-month changes since November 2022 being lower than in previous months.

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[5] For a detailed review of measures of underlying inflation, see the ECB Blog entry "Inflation Diagnostics".

Chart 11

Indicators of underlying inflation

(annual percentage changes)

- ■ Range of underlying indicators
- ── HICPX
- ── HICPXX
- ── PCCI
- ── Supercore
- ── Domestic inflation
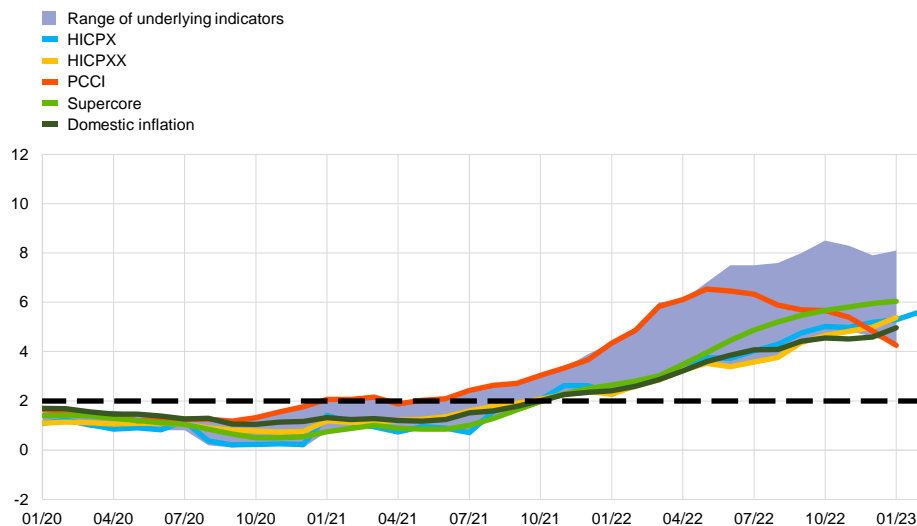
Sources: Eurostat and ECB calculations.
Notes: The range of indicators of underlying inflation includes HICP excluding energy and unprocessed food, HICPX (HICP excluding energy and food), HICPXX (HICP excluding energy, food, travel-related items, clothing and footwear), the 10% and 30% trimmed means, the PCCI (Persistent and Common Component of Inflation) and the Supercore. The latest observations are for February 2023 (flash estimate) for the HICPX and January 2023 for the remaining items.

Pipeline pressures for consumer goods inflation remained strong, despite some easing in the pricing chain (Chart 12). Accumulated pipeline pressures from supply bottlenecks and high energy prices are still having an effect, underpinning the continued high NEIG inflation rate of 6.8% in February 2023, up from 6.7% in the previous month. Data for producer prices in January 2023 showed that pipeline pressures were still strong, particularly at the later stages of the pricing chain. At the same time, the annual growth rate of producer prices for domestic sales of non-food consumer goods fell to 8.8% in January 2023 from 9.4% in December 2022, showing tentative signs of easing. The growth in import prices for non-food consumer goods continued to slow, helped by the euro exchange rate appreciation, standing at 4.7% in January 2023, down from 5.5% in the previous month. The decrease in the annual growth rate of import prices and producer prices for intermediate goods was stronger over the same period, down from 8.6% to 5.6% and from 13.7% to 11.3% respectively. This points to some easing of pressure along the pricing chain.

Chart 12

Indicators of pipeline pressures

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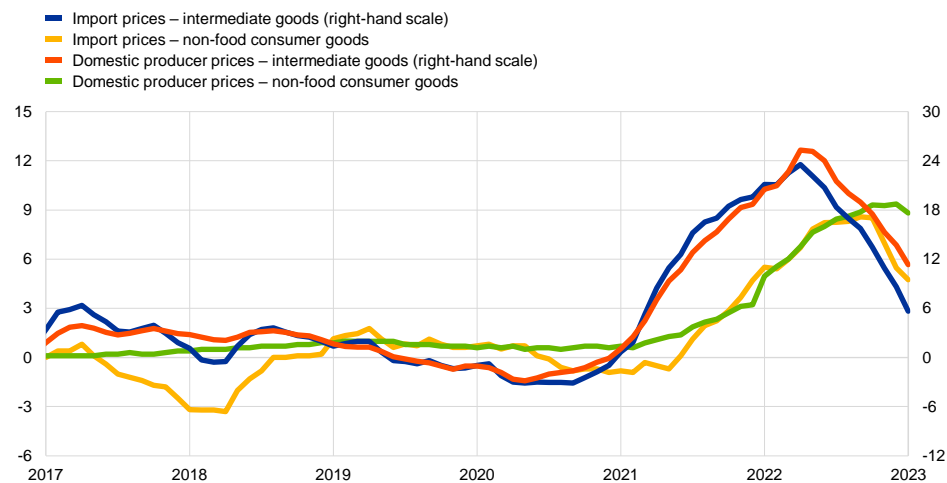
Sources: Eurostat and ECB calculations.
Note: The latest observations are for January 2023.

Wage dynamics strengthened at the end of 2022. While negotiated wage growth gradually inched up to 3.0% in the fourth quarter of 2022, actual wage growth as measured by compensation per employee and compensation per hour strengthened considerably (Chart 13). National accounts show that compensation per employee year-on-year growth in the euro area rose to 5.1% in the fourth quarter of 2022 (up from 3.9% in the previous quarter), largely driven by higher growth in the non-market services sector. Growth in compensation per hour also edged upwards in the fourth quarter of 2022, reaching 4.5% year on year, up from 3.0% in the previous quarter. The high consumer inflation rates observed at the end of 2022 imply that, in real terms, average wages per employee and per hour continued to decline in the fourth quarter of 2022. Information from wage negotiations concluded in late 2022 and early 2023 suggest that the strengthened nominal wage growth is set to continue.

Chart 13

Breakdown of compensation per employee into compensation per hour and hours worked per employee

(annual percentage changes)

- ■ Compensation per employee
- ■ Compensation per hour
- ■ Negotiated wages
- ■ Hours worked per employee

Sources: Eurostat and ECB calculations.
Note: The latest observations are for the fourth quarter of 2022.

Domestic price pressures continued to increase on account of both labour costs and profit margin developments. The year-on-year growth rate of the GDP deflator rose to 5.8% in the fourth quarter of 2022, up from 4.6% in the previous quarter, driven by both labour costs and profits. Growth in unit labour costs increased from 3.2% to 4.7% between the third and fourth quarters of 2022, while year-on-year growth in unit profits (as measured by gross operating surplus) surged from 7.4% to 9.4%. Overall, unit profits accounted for more than half of the growth in domestic cost pressures in the fourth quarter of 2022. The environment of supply/demand imbalances in many sectors, high input price pressures and generally high inflation appears to have facilitated increases in profit margins that go beyond pure recuperation of input costs. Strong developments in unit profits, with some heterogeneities, are visible across all main economic sectors in 2022 and, by contrast with the pandemic period, have also become more visible in contact-intensive services sectors (Chart 14).

Chart 14

Sectoral unit profit developments

(gross operating surplus over real value added, levels)

- Total activities
- Agriculture, forestry and fishing
- Industry excluding construction
- Construction
- Contact-intensive services
- Total services
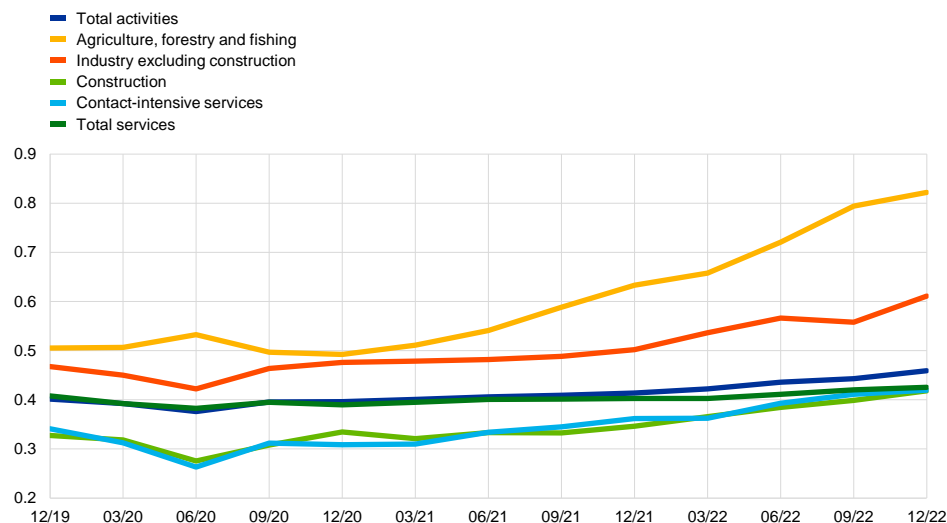
Sources: Eurostat and ECB calculations.
Notes: For each sector, unit profits are computed as gross operating surplus over real gross value added. Gross operating surplus is estimated as nominal gross value added minus compensation of employees. Compensation of employees includes labour income for the self-employed, assuming that the per capita labour compensation of the self-employed is the same as that of employees. Contact-intensive services include trade, transport, accommodation and food as well as arts, entertainment, recreation and other services. The latest observations are for the fourth quarter of 2022.

Survey and market-based evidence shows that forecasters continue to expect inflation to decline, with longer-term expectations remaining at around the ECB's 2.0% target (Chart 15). In the ECB's most recent Survey of Professional Forecasters (SPF) in January 2023, inflation expectations for 2023 were revised slightly upwards by 0.14 percentage points to 5.9%. Long-term inflation expectations for 2027 in this survey were slightly lower at 2.1% (down from 2.2%) for the HICP and 2.0% (down from 2.1%) for the HICPX. The median long-term inflation expectations for 2026 set out in the February 2023 ECB Survey of Monetary Analysts remained unchanged at 2.0%, in line with recent rounds of other surveys (2.0% for 2027 in the February 2023 Consensus Economics survey). According to the latest ECB Consumer Expectations Survey (January 2023), the mean/median inflation expectations for three years ahead fell substantially to 3.8%/2.5%, from 4.6%/3.0% in the previous round. The market-based measures of inflation compensation (based on HICP excluding tobacco) on 15 March 2023 suggest that euro area inflation will decline in 2023 to stand at 3.8% in December 2023. Over the course of 2024, market-based measures of inflation compensation suggest that inflation will move closer to 2.0%. Longer-term measures of inflation compensation increased moderately over the review period, with the five-year forward inflation-linked swap rate five years ahead standing at 2.35% on 15 March 2023. Importantly, however, market-based measures of inflation compensation are not a direct measure of market participants' actual inflation expectations since they contain inflation risk premia to compensate for inflation uncertainty. By contrast, survey-based measures of long-term inflation expectations, which are free of inflation risk premia, have been relatively stable at around 2.0%. This relative stability suggests that the current

volatility in long-term market-based measures predominantly reflects variations in inflation risk premia.

Chart 15

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

(annual percentage changes)

- HICP
- ECB staff macroeconomic projections (March 2023)
- Consensus Economics – HICP
- Market-based measures of inflation compensation (15 March 2023)
- SPF Q1 2023
- SPF Q3 2022
- SPF Q4 2022
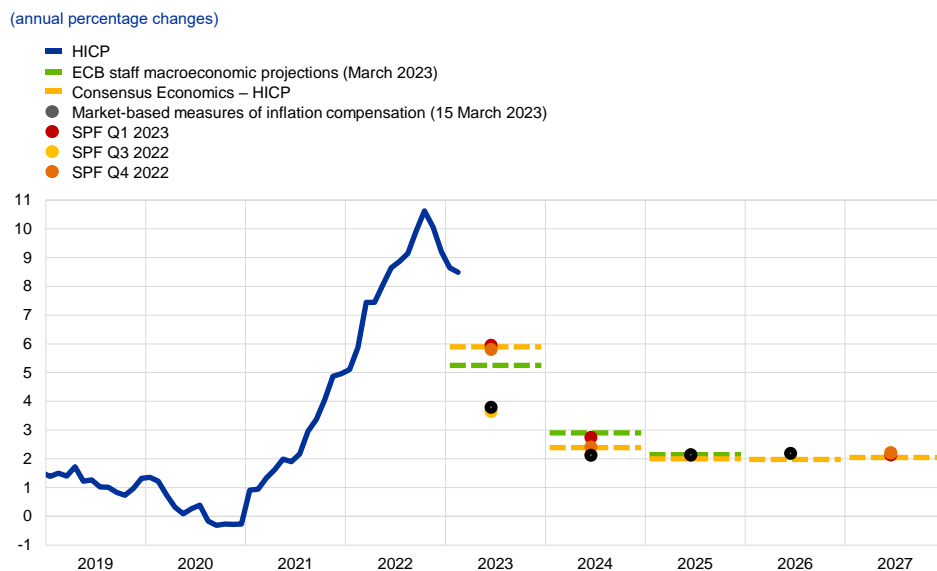
Sources: Eurostat, Refinitiv, Consensus Economics, Survey of Professional Forecasters (first quarter of 2023), ECB staff macroeconomic projections for the euro area (March 2023) and ECB calculations.
Notes: HICP stands for Harmonised Index of Consumer Prices. SPF stands for Survey of Professional Forecasters. The market-based indicators of inflation compensation series are based on the one-year spot inflation rate, the one-year forward rate one year ahead, the one-year forward rate two years ahead, the one-year forward rate three years ahead and the one-year forward rate four years ahead. Due to indexation lag, the latest available one-year spot inflation rate indicates the inflation compensation between December 2022 and December 2023. The forward inflation rates also indicate the inflation rate in December compared with the previous year. The latest observations for the HICP was for February 2023 (flash estimate). The March 2023 ECB staff macroeconomic projections for the euro area were finalised in early March and the cut-off date for the technical assumptions was 15 February 2023. The cut-off date for the Consensus Economics long-term forecasts was January 2023. The latest observations for market-based indicators of inflation compensation are for 15 March 2023. The SPF for the first quarter of 2023 was conducted between 6 and 12 January 2023.

The March 2023 ECB staff macroeconomic projections for the euro area envisage headline inflation remaining high in the near term, averaging 5.3% in 2023, before decreasing to 2.9% in 2024 and 2.1% in 2025 (Chart 16). Headline inflation is expected to fall significantly over the course of 2023, driven by downward energy-related base effects, declines in energy prices and easing pipeline pressures. The baseline projection sees headline inflation declining from 10.0% in the fourth quarter of 2022 to 2.8% in the fourth quarter of 2023, to then hover around 3.0% in 2024 before reaching the ECB's inflation target of 2.0% in the third quarter of 2025. HICPX inflation is expected to moderate as pipeline price pressures gradually ease (compounded by the recent falls in energy prices) and the tighter monetary policy is transmitted to the economy, while historically high wage growth will contribute to keeping core inflation elevated. The expected decline from 4.6% in 2023 to 2.2% in 2025 follows the unwinding of the upward impacts of supply bottlenecks and the effects of the reopening of the economy, coupled with lagged effects from the slowdown in growth and an easing of the indirect effects from the rise in energy prices. Compared with the December 2022 Eurosystem staff macroeconomic projections, headline inflation has been revised downwards for all years of the projection horizon (by 1.0 percentage point for 2023, 0.5 percentage points for 2024 and 0.2 percentage points for 2025). The large downward revision in 2023 was

driven mainly by a lower path for energy inflation, while in 2024 and 2025 it also reflects a downward revision to HICPX inflation of 0.3 and 0.2 percentage points respectively.

Chart 16

Euro area HICP and HICPX inflation

(annual percentage changes)

- ■ HICP inflation
- ■ HICP inflation excluding energy and food
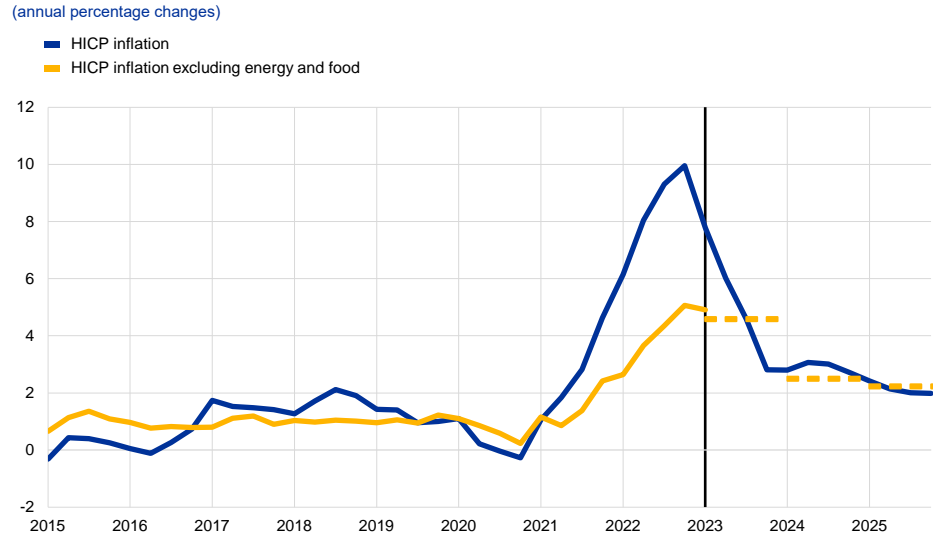
Sources: Eurostat and ECB staff macroeconomic projections for the euro area (March 2023).
Notes: HICP stands for Harmonised Index of Consumer Prices. HICPX stands for HICP inflation excluding energy and food. The vertical line indicates the start of the projection horizon. The latest observations are for the first quarter of 2023 for the data and the fourth quarter of 2025 for the projections. The March 2023 ECB staff macroeconomic projections for the euro area were finalised in early March and the cut-off date for the technical assumptions was 15 February 2023. Historical data for HICP and HICPX inflation are at quarterly frequency. Forecast data are at quarterly frequency for HICP inflation and annual frequency for HICPX inflation.

4 Financial market developments

The review period (15 December 2022 to 15 March 2023) witnessed a highly volatile pattern in euro area financial markets and culminated in rising market tensions and heightened uncertainty, sparked by difficulties at several US regional banks and a major Swiss financial institution. Prior to these market tensions, short- and long-term interest rates were largely driven higher by market expectations of a more pronounced and long-lasting monetary policy tightening, as underlying price pressures remained strong, despite headline inflation declining. The expectations for these rate increases largely receded after market participants repriced the future path of monetary policy rates in light of rising market tensions and their ramifications for the inflation outlook. On net, over the entire review period, euro area risk-free rates and longer-term bond yields increased only slightly. The broad-based sell-off in risky assets towards the end of the review period led to a sizeable widening in high-yield corporate bond spreads and a large fall in equity prices, notably for banks. In foreign exchange markets, the euro remained broadly unchanged in trade-weighted terms during the review period.

Over the review period (15 December 2022 to 15 March 2023) euro area short-term risk-free rates increased only slightly, as market expectations of a more pronounced monetary policy tightening largely receded towards the end of the review period amid rising financial market tensions. The benchmark euro short-term rate (€STR) closely followed the changes in the deposit facility rate, which the Governing Council raised by 50 basis points at its monetary policy meetings in December (from 1.5% to 2%) and February (from 2% to 2.5%). During most of the review period, the overnight index swap (OIS) forward curve, based on the €STR, increased significantly, reflecting firmer expectations of further rate hikes, driven by a more resilient growth outlook and strong underlying inflationary pressures. However, towards the end of the review period, the elevated level of uncertainty – sparked by the difficulties at several regional US-based banks and Credit Suisse – also created tension in euro area financial markets. Amid high volatility, the €STR forward curve moved significantly lower across tenors. At the end of the review period, the peak rate was priced to reach close to 3.3% in early 2024 (compared with a peak rate of 2.9% at the beginning of the review period), while pointing to a reversal as from the second quarter of 2024. Overall, the €STR forward curve moved higher across maturities during the review period.

Chart 17

€STR forward rates

(percentages per annum)

- Realised €STR
- €STR forward curve 14 December 2022
- €STR forward curve 1 February 2023
- €STR forward curve 15 March 2023
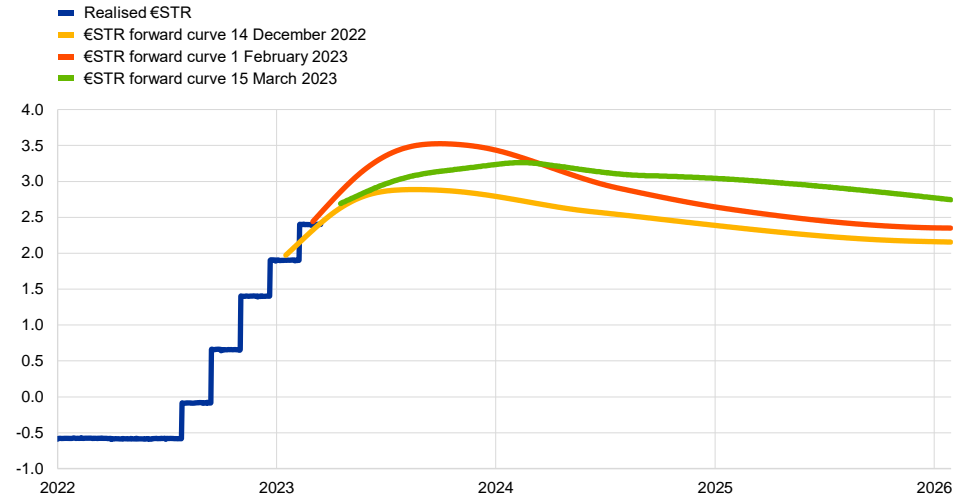
Sources: Thomson Reuters and ECB calculations.
Note: The forward curve is estimated using spot OIS (€STR) rates.

Long-term government bond yields followed the movements in risk-free rates and were also highly affected by the elevated level of uncertainty (Chart 18).
Over the review period, long-term government bond yields broadly followed the development in risk-free rates and were subject to considerable volatility. Long-term bond yields remained sensitive to incoming macroeconomic news, before also being highly affected by the increased uncertainty in financial markets, triggered by difficulties at certain US banks. The ten-year GDP-weighted euro area sovereign bond yield broadly tracked the ten-year euro OIS rate for most of the period, with broadly similar movements in the US and UK ten-year sovereign bond yields. Amid intermediate swings related to macroeconomic news, the ten-year euro OIS rate and the ten-year GDP-weighted euro area sovereign bond rate increased substantially from 15 December 2022, before most of that increase was reversed amid rising market tensions at the end of the review period. The rising market tensions led to a smaller drop in the ten-year OIS rate compared with the ten-year GDP-weighted sovereign bond yield – in particular, the ten-year German sovereign bond yield showed a decline. Over the entire review period, the ten-year euro area OIS rate and ten-year GDP-weighted average sovereign yield increased by 31 and 7 basis points, reaching 2.76% and 2.84%, respectively.

Chart 18

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

(percentages per annum)
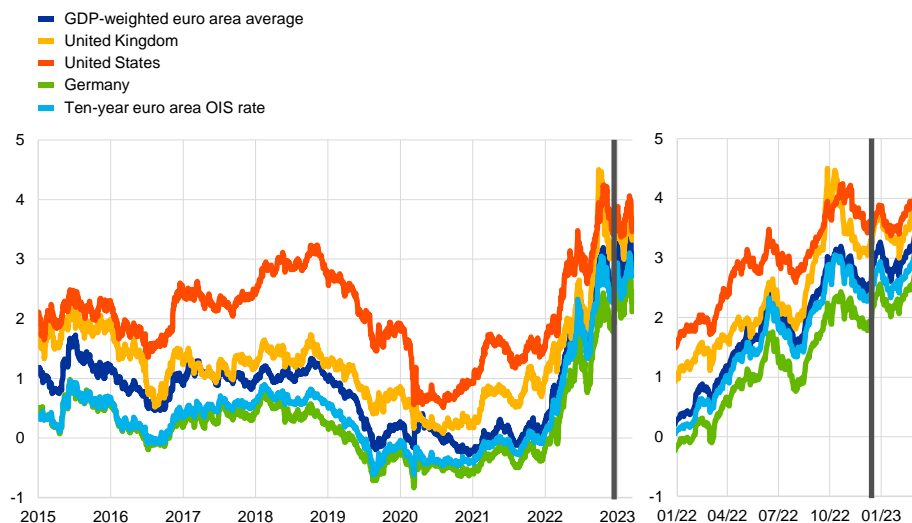
- GDP-weighted euro area average
- United Kingdom
- United States
- Germany
- Ten-year euro area OIS rate

Sources: Refinitiv and ECB calculations.
Notes: The vertical grey line denotes the start of the review period on 15 December 2022. The latest observations are for 15 March 2023.

Euro area sovereign bond yields moved broadly in line with risk-free rates for most of the review period, with sovereign spreads narrowing somewhat towards the end of the period across countries (Chart 19). While long-term risk-free rates showed sizeable fluctuations over the review period, the ten-year GDP-weighted euro area sovereign bond spread over the OIS rate remained relatively stable until the last days of the review period; as market tensions increased, European bank stocks plunged and risk sentiment among market participants dropped markedly, triggering a decline in euro area government bond yields relative to swap rates. The ten-year GDP-weighted average government bond yield ended the review period 24 basis points lower than in mid-December 2022. The decline reflected a tightening of sovereign spreads across countries. For instance, the Italian ten-year sovereign bond spread declined by 36 basis points, while the corresponding spreads for Greece and Germany declined by 28 basis points.

Chart 19

Ten-year euro area sovereign bond spreads vis-à-vis the ten-year OIS rate based on the €STR
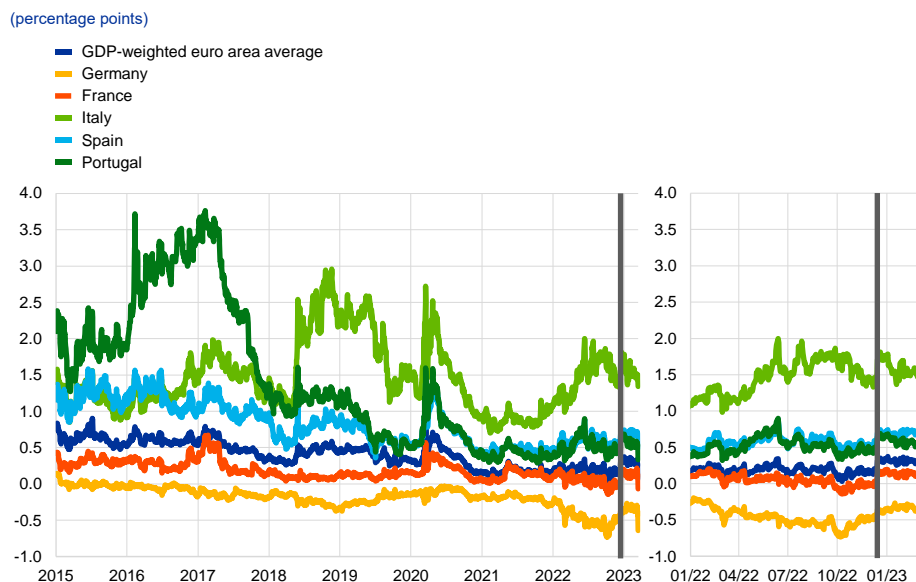
(percentage points)

- GDP-weighted euro area average
- Germany
- France
- Italy
- Spain
- Portugal

Sources: Refinitiv and ECB calculations.
Notes: The vertical grey line denotes the start of the review period on 15 December 2022. The latest observations are for 15 March 2023.

As risk sentiment declined late in the review period, high-yield corporate bond spreads increased significantly and ended the review period higher than at the start. Despite corporate bond spreads having tightened for most of the review period on the back of an improved macroeconomic outlook, the sudden drop in risk sentiment at the end of the review period meant that high-yield corporate bond spreads increased substantially and ended the review period 23 basis points higher than they started. Spreads on investment-grade corporate bonds remained broadly unchanged over the review period.

In keeping with this development, European equity prices saw a large fall amid the broad-based sell-off in risky assets towards the end of the review period. While the fall in equity prices at the end of the review period was broad-based, it was particularly severe for bank stocks. However, before the fall, euro area equity prices had been on the rise, driven mainly by the banking sector against the backdrop of a more resilient near-term growth outlook and a better than expected reporting season for earnings in the fourth quarter of 2022. Considering the entire review period, equity prices of non-financial corporations (NFCs) increased by 5.2% in the euro area and by 1.1% in the United States. For the banking sector, the index gained 8.4% in the euro area, while it lost 10.8% in the United States.

Chart 20

Euro area and US equity price indices

(index: 1 January 2015 = 100)
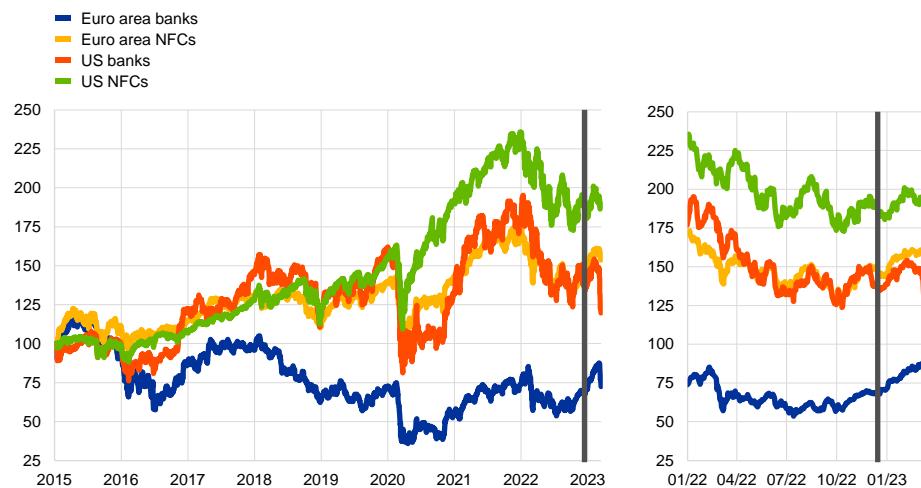
- Euro area banks
- Euro area NFCs
- US banks
- US NFCs

Sources: Refinitiv and ECB calculations.
Notes: The vertical grey line denotes the start of the review period on 15 December 2022. The latest observations are for 15 March 2023.

In foreign exchange markets, the euro remained broadly unchanged in trade-weighted terms (Chart 21). During the review period the nominal effective exchange rate of the euro – as measured against the currencies of 41 of the euro area's most important trading partners – appreciated by 0.1%. In terms of bilateral exchange rate movements, the euro depreciated against most major currencies, including the US dollar (by 0.7%), the Chinese renminbi (by 1.5%), the Japanese yen (by 3.8%) and the Swiss franc (by 1.4%). At the same time, the euro strengthened against the pound sterling (by 1.2%) as well as against some other European currencies.

Chart 21

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

(percentage changes)

- Since 15 December 2022
- Since 15 March 2022
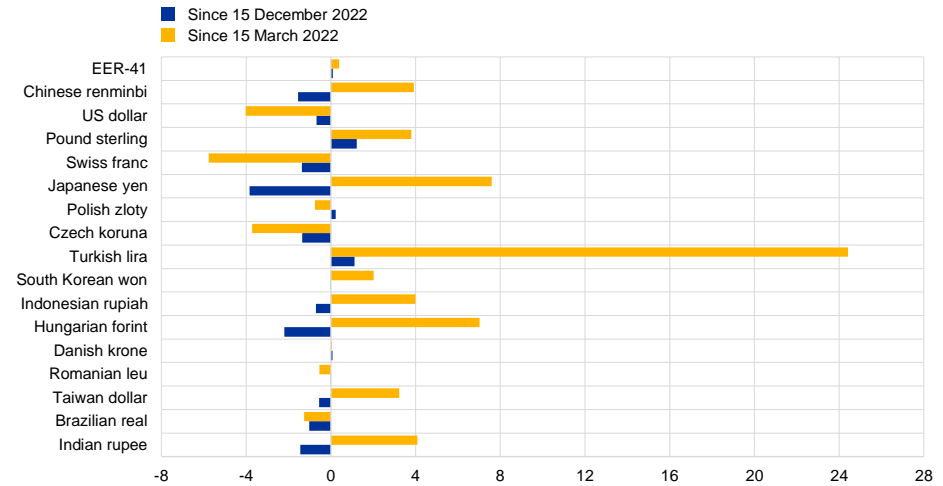
Source: ECB.
Notes: EER-41 is the nominal effective exchange rate of the euro against the currencies of 41 of the euro area's most important trading partners. A positive (negative) change corresponds to an appreciation (depreciation) of the euro. All changes have been calculated using the foreign exchange rates prevailing on 15 March 2023.

5   Financing conditions and credit developments

In January 2023 bank lending rates rose further, reflecting increases in the key ECB interest rates. Bank lending to firms and households also moderated further in January amid higher interest rates, weaker demand and tighter credit standards. Over the period from 15 December 2022 to 15 March 2023 the cost of equity financing declined substantially, while the cost of market-based debt financing recorded only a slight increase. Growth in the total volume of external financing for firms slowed markedly. Monetary dynamics moderated sharply, driven by their most liquid components and slower credit growth.

The funding costs of euro area banks increased in January, reflecting movements in market rates and higher deposit rates. The composite cost of debt financing of euro area banks increased further and stood at its highest level since 2014 (Chart 22, panel a). In January bank bond yields rose again, resuming the strong upward trend that started last year. Bank bond yields increased by almost 400 basis points between January 2022 and March 2023 (Chart 22, panel b). Deposit rates increased somewhat to 0.56% in January, from 0.50% in December, bringing the cumulated increase since the beginning of 2022 to around 50 basis points. This increase was significantly smaller than the 300 basis point rise in the key ECB interest rates during the same period. The sluggish adjustment of deposit rates to changes in policy rates and the resulting widening of the spread between deposit and policy rates is in line with patterns observed during past interest rate hiking cycles. This development mainly reflects the tendency of the remuneration of overnight deposits, which make up a large share of banks' deposit base, to be less responsive to policy rate increases than the remuneration of time deposits, which closely mirrored changes in policy rates. One reason for this is that overnight deposits offer liquidity and payment services that are often not explicitly priced. The recalibration of the terms and conditions of the third series of targeted longer-term refinancing operations (TLTRO III), which took effect on 23 November 2022, also contributed to a normalisation of overall bank funding costs.[6] Between November 2022 and February 2023 banks made sizeable (mandatory and, in particular, voluntary) repayments of funds borrowed under TLTRO III (€896 billion), reducing outstanding amounts by around 42% following the recalibration. Furthermore, since the end of 2021 banks have increased their issuance of bonds amid the winding-down of TLTROs and the slowdown in deposits. In terms of balance sheet strength, euro area banks are well capitalised overall, exceeding regulatory requirements and capital targets, but the risks stemming from a weakening economic environment may worsen banks' asset quality, and there are early signs of increasing credit risk, as, for example, suggested by developments in underperforming loans.

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[6]   See "ECB recalibrates targeted lending operations to help restore price stability over the medium term", *press release*, ECB, 27 October 2022.

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Chart 22

Composite bank funding rates in selected euro area countries

(annual percentages)

- Euro area
- Germany
- France
- Spain
- Italy

a) Banks' composite cost of debt financing

b) Bank bond yields
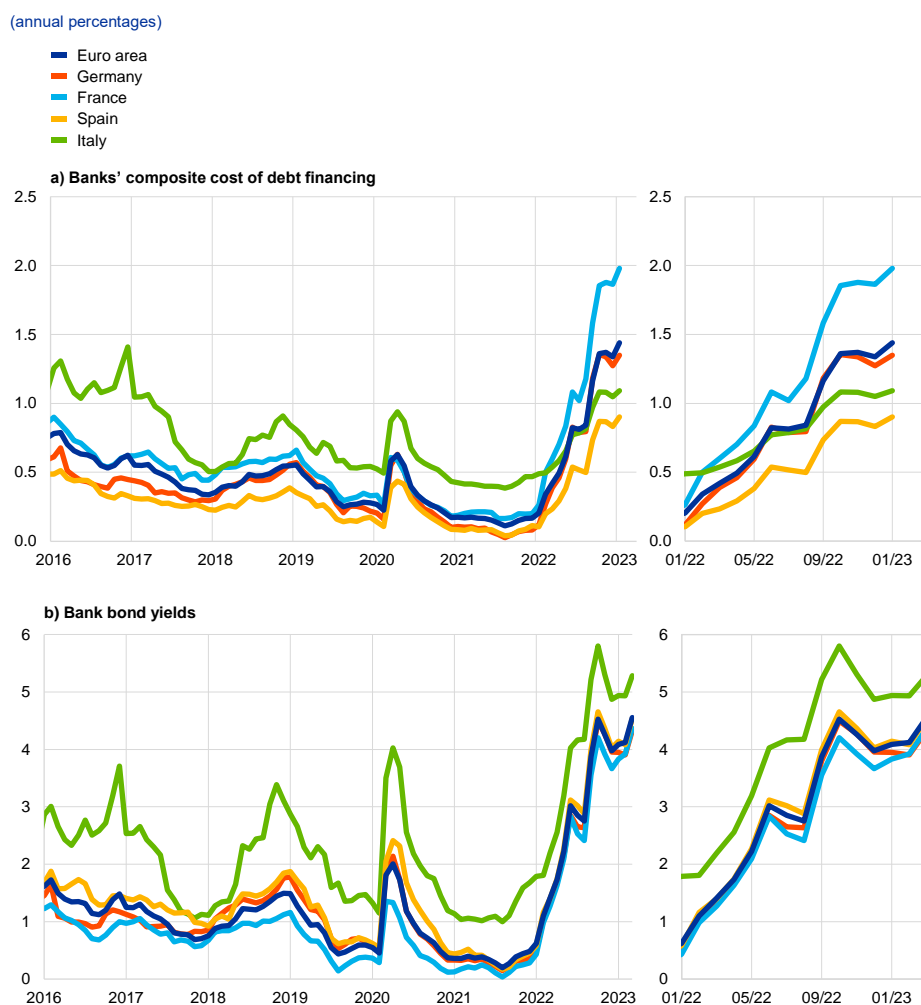
Sources: ECB, IHS Markit iBoxx indices and ECB calculations.
Notes: Composite bank funding rates are a weighted average of the composite cost of deposits and unsecured market-based debt financing. The composite cost of deposits is calculated as an average of new business rates on overnight deposits, 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 January 2023 for composite bank funding rates and 15 March 2023 for bank bond yields.

Bank lending rates for firms and households rose further in January 2023, reflecting the increases in the key ECB interest rates. Changes in the ECB's monetary policy measures are being transmitted through to bank lending conditions. Since the beginning of 2022 increases in bank funding costs have pushed lending rates up sharply in all euro area countries (Chart 23), while credit standards have become tighter. Bank lending rates for loans to non-financial corporations (NFCs) increased to 3.63% in January 2023, compared with 3.41% in December 2022 and 1.43% a year before. Bank lending rates for loans to households for house purchase also rose further, to stand at 3.10% in January, compared with 2.94% in December and 1.33% a year before. These increases were faster than in previous hiking cycles, mainly reflecting the faster pace of policy rate hikes. Results from the January 2023 Consumer Expectations Survey suggest that consumers expect mortgage rates to increase further over the next 12 months. They also expect it to

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become harder to obtain housing loans. The spread between bank lending rates on small and large loans increased somewhat in January, reflecting developments in the rates on small loans, but remained close to its historical low. The cross-country dispersion of lending rates to firms and households remained stable, suggesting that the transmission of the ECB's monetary policy tightening is working smoothly (Chart 23, panels a and b).

Chart 23

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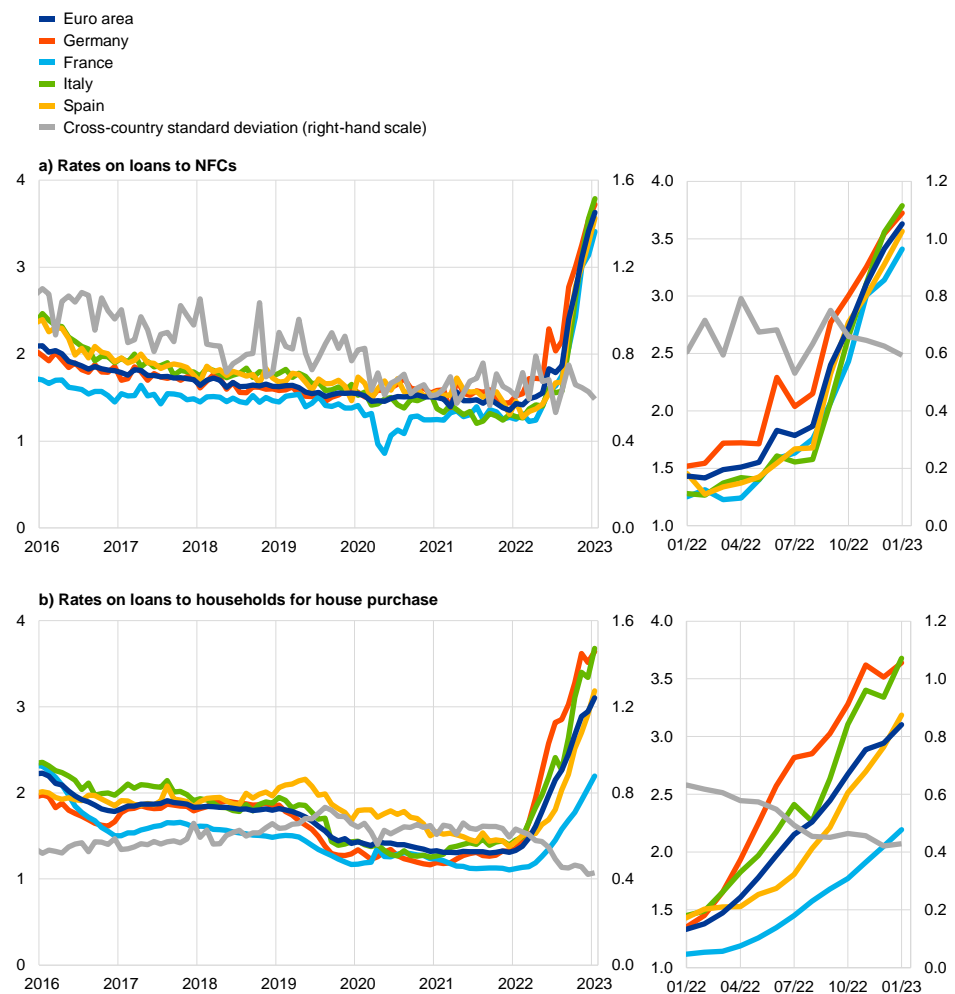
Source: ECB.
Notes: Composite bank lending rates are calculated by aggregating short and long-term rates using a 24-month moving average of new business volumes. The cross-country standard deviation is calculated using a fixed sample of 12 euro area countries. The latest observations are for January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

Over the period from 15 December 2022 to 15 March 2023 the cost of equity financing for NFCs declined substantially, while the cost of market-based debt increased only slightly. Owing to lags in the available data on the cost of borrowing from banks, the overall cost of financing for NFCs, comprising the cost of bank borrowing, the cost of market-based debt and the cost of equity, can be calculated only up to January 2023, when it stood at 5.7%, around 15 basis points below its level in the previous month (Chart 24). This was the result of a decline in the cost of

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both market-based debt – owing both to lower risk-free rates and to the compression of corporate bond spreads – and equity financing that outweighed the increase in the cost of both short and long-term bank debt. While decreasing slightly from its peak in October 2022, in January 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 increased slightly, owing to the increase in the risk-free rates, which was most pronounced at the very short end of the curve. Corporate bond spreads in the high-yield segments also increased, while the spread on investment grade bonds remained virtually unchanged. The small increase in the risk-free rates, however, did not compensate for the sharp decline in the equity risk premium, thus leading to a sizeable decline in the cost of equity.

Chart 24

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

(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
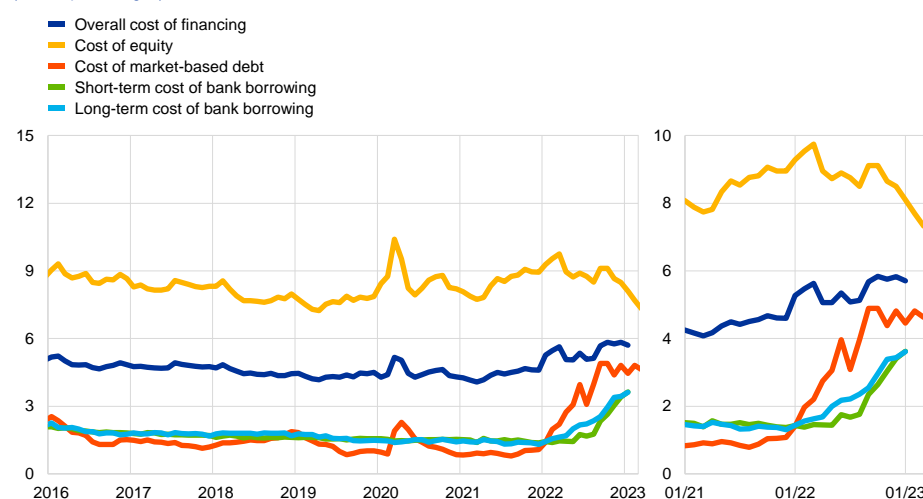
Sources: ECB and ECB estimates, Eurostat, Dealogic, Merrill Lynch, Bloomberg and Thomson Reuters.
Notes: The overall cost of financing for NFCs is calculated as a weighted average of the cost of borrowing from banks, market-based debt and equity, based on their respective outstanding amounts. The latest observations are for **15 March 2023** for the cost of market-based debt (monthly average of daily data), 10 March 2023 for the cost of equity (weekly data) and **31 January 2023** for the overall cost of financing and the cost of borrowing from banks (monthly data).

Bank lending to firms and households slowed further in January, amid higher interest rates, weaker demand and tighter credit standards. The annual growth rate of loans to NFCs declined to 6.1% in January from 6.3% in December (Chart 25, panel a). This slowdown was widespread across the largest economies and reflects higher interest rates, weakening demand and tighter credit standards. In terms of maturities, the contraction was especially visible for short-term loans linked to higher costs of working capital. The annual growth rate of loans to households also moderated, to 3.6% in January from 3.8% in December (Chart 25, panel b). While this development is mainly explained by the ongoing decline in the growth of housing loans, consumer credit and other lending also contributed somewhat to weaker lending to households. The main drivers of the slowdown in household borrowing were rising interest rates, tightening bank credit standards and weakening loan demand on the back of deteriorating housing market prospects and low consumer confidence.

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Chart 25

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)

a) MFI loans to NFCs

b) MFI loans to households
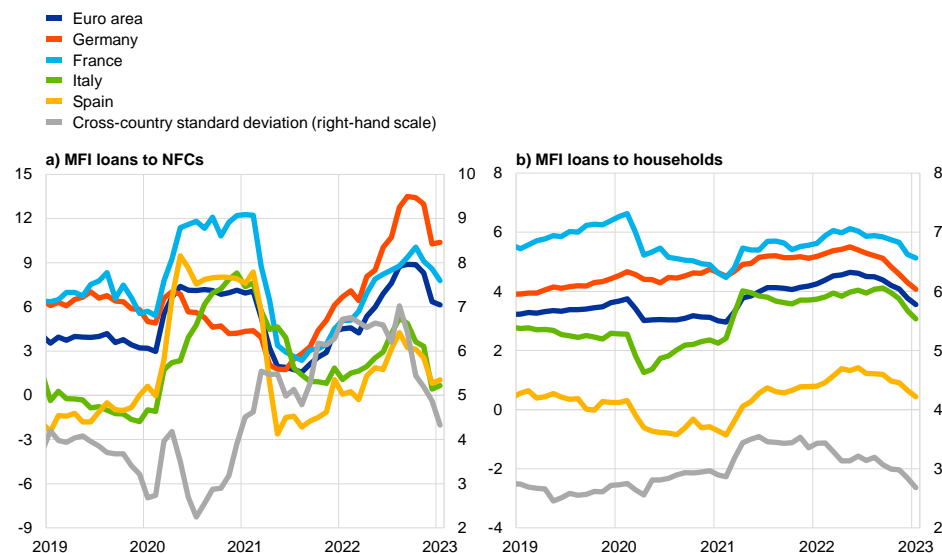
Source: ECB.
Notes: Loans from monetary financial institutions (MFIs) are adjusted for loan sales and securitisation; in the case of NFCs, loans are also adjusted for notional cash pooling. The cross-country standard deviation is calculated using a fixed sample of 12 euro area countries. The latest observations are for January 2023.

Growth in the total volume of external financing for firms slowed markedly, mainly reflecting weaker bank borrowing. The annual growth rate of external financing decreased from 3.2% in October to 2.3% in January 2023, reflecting lower financing needs of firms as economic activity slowed down and the tightening of banks' credit standards (Chart 26). Net issuance of debt securities turned negative again in January after two months of partial recovery. The issuance of listed shares was muted overall but picked up again in December, driven by the public recapitalisation of one large energy-intensive firm.

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Chart 26

Net external financing flows for euro area NFCs

(monthly flows; EUR billions)

- Total external financing
- Borrowing from banks
- Net issuance of debt securities
- Net issuance of listed shares
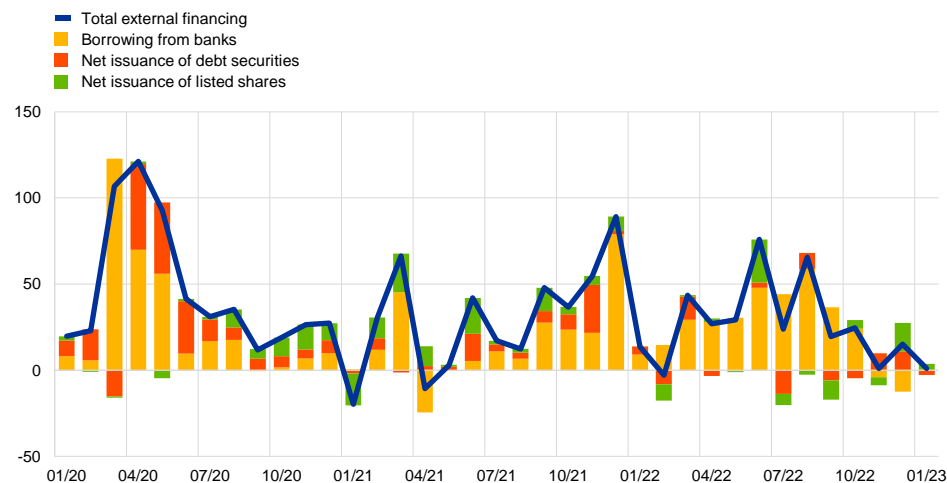
Sources: ECB, Eurostat, Dealogic and ECB calculations.
Notes: Net external financing is the sum of borrowing from banks (MFI loans), net issuance of debt securities and net issuance of listed shares. MFI loans are adjusted for loan sales, securitisation and cash-pooling activities. The latest observations are for January 2023.

The reallocation of funds from overnight deposits to time deposits continued in January, reflecting changes in the relative remunerations of these instruments. The annual growth rate of overnight deposits turned negative in January and stood at -1.3%. The sharp decline in the growth of overnight deposits since the second quarter of 2022 (Chart 27) is explained by the large-scale substitution of overnight deposits with time deposits and lower economic growth. This portfolio reallocation has been triggered by the higher remuneration of time deposits relative to overnight deposits. This is in line with historical patterns during tightening cycles, according to which the remuneration of overnight deposits adjusts sluggishly to policy rate changes, while the remuneration of time deposits adjusts faster, implying a widening of interest rate spreads. However, the shift towards time deposits in the current tightening cycle is stronger than in past tightening cycles, as the share of overnight deposits had become larger than usual during the period of low interest rates when the opportunity cost of holding very liquid assets was particularly low.

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Chart 27

M3, M1 and overnight deposits

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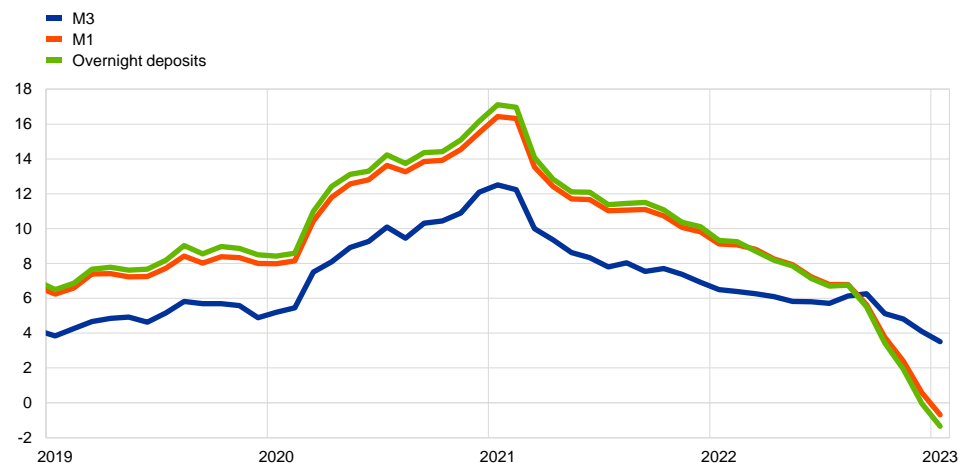
Source: ECB.
Note: The latest observations are for January 2023.

Monetary dynamics moderated sharply in the fourth quarter of 2022 and January 2023, driven by its most liquid components and slower credit growth.
Annual broad money (M3) growth decreased to 3.5% in January from 4.1% in December (Chart 27). The declining trend continued to be driven by the phasing out of Eurosystem net asset purchases and TLTROs, weaker credit dynamics amid higher interest rates and a gradual shift by banks towards longer-term funding sources. Monetary outflows from the euro area to the rest of the world dampened broad money growth in January in the context of net sales of euro area government securities by non-residents. As regards the components of broad money, the growth of the narrow aggregate M1 recorded a further marked decline and turned negative for the first time since the start of Economic and Monetary Union, thus making a negative contribution to M3 growth. This development is also being driven by the shifting of funds from overnight deposits to better-remunerated time deposits in the context of higher rates.

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6 Fiscal developments

According to the March 2023 ECB staff macroeconomic projections, the euro area fiscal outlook continues to improve, but the deficit and debt ratios remain well above pre-pandemic levels. The euro area deficit ratio is projected to fall to 3.4% in 2023 and to 2.4% in 2024, remaining at this level in 2025. The euro area fiscal stance is projected to be broadly neutral in 2023 and to tighten significantly in 2024, before turning neutral again in 2025. The debt-to-GDP ratio of the euro area is projected to decline from an estimated 91% in 2022 to about 87% in 2025. The baseline fiscal projections continue to be surrounded by high uncertainty, especially regarding the scale of energy support in view of the recent decline in energy prices. From a policy perspective, government support measures to shield the economy from the impact of high energy prices should be temporary, targeted and tailored to preserving incentives for lower energy consumption. As energy prices fall and risks around the energy supply recede, it is important to start rolling back these measures promptly and in a concerted manner. Fiscal measures falling short of these principles are likely to drive up medium-term inflationary pressures, which would call for a stronger monetary policy response. In the same vein, the Eurogroup Statement published on 13 March 2023 calls for Member States, in the absence of renewed price shocks, to continue phasing out energy support measures, which would also contribute to reducing government deficits. Moreover, in line with the EU's economic governance framework, fiscal policies should be oriented towards making our economy more productive and gradually bringing down high levels of public debt. The reform of the EU's economic governance framework should be concluded rapidly.

According to the March 2023 ECB staff macroeconomic projections, the euro area general government budget balance will improve over the projection horizon.[7] [8] The euro area budget deficit is projected to decline to 3.4% of GDP in 2023 and to fall more significantly in 2024, to 2.4% of GDP, remaining unchanged in 2025 (Chart 28). A statistical reclassification from cash to accrual terms of tax credits for housing construction improvements in Italy led to significant revisions of the expected euro area fiscal deficit. The deficit was revised up by about 0.3 percentage points of GDP in 2022 (to 3.7% of GDP), and down by around 0.1 percentage points over the rest of the projection horizon. Apart from Italy's statistical reclassification, in the absence of major budget news, the euro area deficit outlook is mainly influenced by the downward rescaling of the fiscal support measures being implemented by governments in response to the energy crisis and high inflation. These measures are now estimated to amount to 1.8% of GDP at the euro area level in 2023 from more than 1.9% of GDP in the December projections, and to 0.5% of GDP in 2024 (Box 9).

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[7] See "ECB staff macroeconomic projections for the euro area, March 2023", published on the ECB's website on 16 March 2023.

[8] The historical data for Italy and the euro area cannot be revised until the full dataset for the Excessive Deficit Procedure notification is made available.

Chart 28

Budget balance and its components

(percentages of GDP)

- Cyclically adjusted primary balance (adjusted for NGEU grants on the revenue side)
- Cyclical component
- Interest payments
- Budget balance
- NGEU grants (on the revenue side)
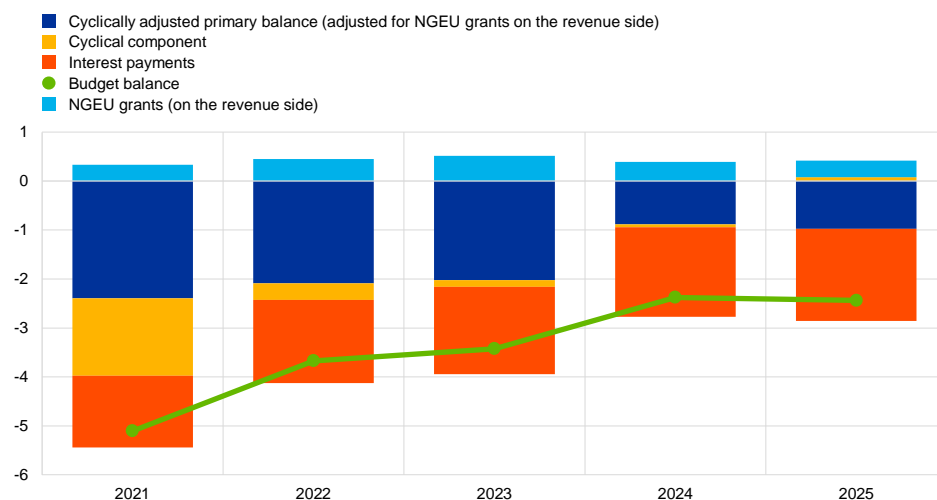
Sources: ECB calculations and March 2023 ECB staff macroeconomic projections.
Notes: Data refer to the aggregate general government sector of euro area countries. The general government budget balance and its
components are adjusted for the estimated impact of a statistical reclassification in Italy over the fiscal projection period 2022-2025.
For past data (2021), this adjustment will be available in the context of Eurostat's April 2023 Excessive Deficit Procedure notifications
and the June 2023 Eurosystem staff macroeconomic projections (both forthcoming).

The euro area fiscal stance is estimated to be broadly neutral in 2023 and to tighten significantly in 2024, before turning neutral again in 2025.[9] The broadly neutral fiscal stance in 2023 is explained by a partial projected reversal of the revenue windfalls from 2021 to 2022, broadly offset by some tightening in the overall discretionary measures, reflecting the withdrawal of part of the stimulus measures that governments implemented in response to the pandemic crisis and the statistical reclassification in Italy. In 2024 the fiscal stance is projected to tighten more significantly, mainly on account of the withdrawal of about 70% of the energy and inflation-related fiscal support implemented by euro area governments in 2023. The support stemming from funds granted under the Next Generation EU (NGEU) programme is also projected to be scaled downwards compared with 2023, while some further reversal of revenue windfalls is expected to mitigate the tightening of the fiscal stance in 2024-25.

The ratio of euro area government debt to GDP is projected to continue to decline to slightly less than 87% of GDP by 2025. After the debt ratio increased by approximately 13 percentage points to around 97% in 2020 owing to euro area governments' responses to the COVID-19 crisis, it is expected to reach 91% of GDP in 2022, decline to around 89% of GDP in 2023, and decrease further to about 87% of GDP in 2025. This reduction is mainly on account of negative differentials between interest rates and nominal GDP growth, which, while narrowing after 2022, are

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[9]   The fiscal stance reflects the direction and size of the stimulus from fiscal policies to the economy beyond the automatic reaction of public finances to the business cycle. It is measured here as the change in the cyclically adjusted primary balance ratio net of government support to the financial sector. Given that the higher budget revenues related to Next Generation EU grants from the EU budget do not have a contractionary impact on demand, in this context the cyclically adjusted primary balance is adjusted to exclude those revenues. For more details on the euro area fiscal stance, see the article entitled "The euro area fiscal stance", *Economic Bulletin*, Issue 4, ECB, 2016.

projected to continue to more than compensate for the primary deficits (Chart 29). Deficit-debt adjustments should be broadly neutral in cumulative terms over the whole projection horizon. Notwithstanding this gradual decline, by 2025 the euro area aggregate debt ratio is expected to remain above its pre-pandemic level (by almost 3 percentage points).

Chart 29

Drivers of change in euro area government debt

(percentages of GDP, unless otherwise indicated)

- Primary balance (-)
- Deficit-debt adjustment
- Interest rate growth differential
- Change in consolidated gross debt (percentage points of GDP)
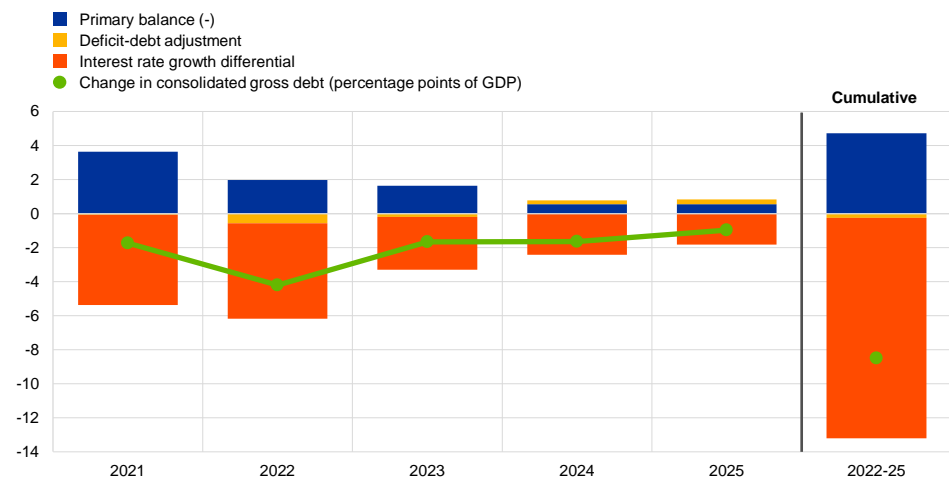
Sources: ECB calculations and March 2023 ECB staff macroeconomic projections.
Note: The data refer to the aggregate general government sector of euro area countries.

Compared with the December 2022 Eurosystem staff macroeconomic projections, the euro area budget balance path has been sightly revised upwards over the period 2023-25. The upward revision is only marginal, despite an expected increase in interest payments from 2024 to 2025. The debt ratio has been revised downwards, mainly reflecting the improvement in the primary balance.

Government support measures to shield the economy from the impact of high energy prices should be temporary, targeted and tailored to preserving incentives for lower energy consumption. As energy prices fall and risks around the energy supply recede, it is important to start rolling back these measures promptly and in a concerted manner. Fiscal measures falling short of these principles are likely to exacerbate inflationary pressures, which would necessitate a stronger monetary policy response. Moreover, in line with the EU's economic governance framework, fiscal policies should be oriented towards making our economy more productive and gradually bringing down high levels of public debt. Following the release of the Communication by the European Commission on 9 November 2022 and of the Council Conclusions on "Orientations for a reform of the EU economic governance framework" for the ECOFIN Council meeting on 14 March 2023, the reform of EU economic governance should be concluded rapidly.

Boxes

1 What shapes spillovers from US monetary policy shocks to emerging market economies?

Prepared by Erik Andres Escayola, Peter McQuade, Christofer Schroeder and Marcel Tirpák

Emerging market economies (EMEs) are facing a challenging and uncertain macroeconomic environment, with weakening global demand, high inflation amid supply shocks and a synchronised tightening of monetary policy all acting as headwinds to growth. This box studies one of those headwinds – the impact of the Federal Reserve System's tightening of monetary policy in the United States – and analyses factors and channels shaping spillovers to large and systemically important EMEs. Overall, EMEs have tended to exhibit greater resilience to shifts in global financing conditions during the current tightening cycle relative to the past, potentially on account of a reduction of their macro-financial vulnerabilities in recent decades. However, there is some heterogeneity in the performance of countries in this regard. We find that the impact of US monetary policy shocks varies across EMEs and is shaped by macro-financial vulnerabilities and monetary policy actions at the national level.

We use a local projections empirical framework to study the ways in which macroeconomic and macro-financial variables in EMEs respond to monetary policy shocks originating in the United States.[1] Using US monetary policy shocks identified at high frequency as our key explanatory variable, we estimate the impulse responses of macro-financial variables and look at how these responses are influenced by specific characteristics of the economies concerned. The baseline results show that a surprise tightening of US monetary policy is typically associated with immediate tightening of an EME's financial conditions, after which industrial production and inflation decline, with that effect peaking after around 18 months.[2] These responses capture the effect of the surprise component of US monetary policy, rather than the systematic component; they have the expected sign and are economically meaningful in terms of their magnitude.

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[1] Our analysis builds on Jarociński, M. and Karadi, P., "Deconstructing Monetary Policy Surprises – The Role of Information Shocks", *American Economic Journal: Macroeconomics*, Vol. 12, No 2, April 2020, pp. 1-43, and Georgiadis, G. and Jarociński, M., "Global implications of multi-dimensional US monetary policy normalisation", *Working Paper Series*, ECB, forthcoming. Central bank announcements can reveal information about both the monetary policy stance (pure monetary policy) and the central bank's assessment of the economic outlook (central bank information). We focus on pure monetary policy shocks, as we are interested in the effect that Federal Reserve policies have on EMEs. We employ a state-dependent local projections framework where state-dependency is modelled using a logistic function, as in Auerbach, A.J. and Gorodnichenko, Y., "Measuring the Output Responses to Fiscal Policy", *American Economic Journal: Economic Policy*, Vol. 4, No 2, May 2012, pp. 1-27.

[2] A US monetary policy shock resulting in a 1 standard deviation increase in the yield on five-year US Treasury bonds over the estimation sample is associated with a tightening of around 1 standard deviation (0.02 percentage points (pp)) in the financial conditions index, a 1 standard deviation (0.3 pp) decline in industrial production, and a decline of one-third of a standard deviation (0.08 pp) in CPI inflation in the median EME.

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EMEs with greater vulnerabilities have stronger responses to US monetary policy shocks. The greater resilience of EMEs thus far could be associated with their lower levels of macro-financial vulnerability. A vulnerability metric suggests that EMEs have become less vulnerable overall over the last decade, albeit some of that downward trend has been reversed by the coronavirus (COVID-19) pandemic (Chart A).[3] When this vulnerability variable is included in regressions and interacted with US monetary policy shocks, we see that financial conditions, industrial production and CPI inflation all respond more strongly when a country is in a more vulnerable state (red dots in Chart B) compared with a less vulnerable state (green dots in Chart B).

Chart A

A vulnerability metric for EMEs

(index)

Legend:
— Median
░ Interquartile range
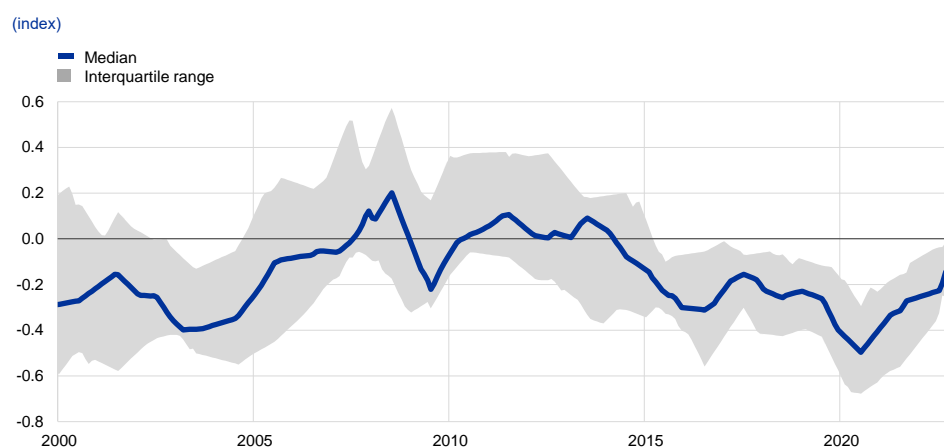
Sources: Haver Analytics, Refinitiv, Georgiadis and Jarociński (op. cit.) and ECB calculations.
Notes: This vulnerability index is based on principal components of four main variables, namely: (i) the real effective exchange rate gap calculated as the deviation from the linear trend (to account for the Balassa-Samuelson effect); (ii) the real effective exchange rate gap calculated as the deviation from the average for advanced economies (included because overvaluations have been shown to be predictors of crises, as in Gourinchas, P.-O. and Obstfeld, M., "Stories of the Twentieth Century for the Twenty-First", *American Economic Journal: Macroeconomics*, Vol. 4, No 1, January 2012, pp. 226-265); (iii) past inflation rates (to capture weakly anchored inflation expectations, as in Ahmed, S., Akinci, O. and Queralto, A., "U.S. monetary policy spillovers to emerging markets: Both shocks and vulnerabilities matter", *International Finance Discussion Papers*, No 1321, Board of Governors of the Federal Reserve System, July 2021); and (iv) US dollar-denominated portfolio debt liabilities relative to GDP (to capture external balance sheet vulnerabilities). The country sample comprises 11 EMEs (Brazil, Chile, China, India, Malaysia, Mexico, Russia, South Africa, South Korea, Thailand and Türkiye) and three EU Member States (the Czech Republic, Hungary and Poland). Higher values indicate greater vulnerability. The latest observations are for November 2022.

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[3] The macro-financial vulnerability metric that is used here summarises EMEs' vulnerability in terms of exchange rate misalignment, the anchoring of inflation expectations and US dollar-denominated foreign liabilities. These variables are particularly relevant at the current juncture in the presence of high inflation and a strengthening US dollar.

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Chart B

The impact of contractionary US monetary policy shocks on EMEs by level of vulnerability

(peak responses; percentage points)

- ☐ Interquartile range
- ● Baseline response (median EME)
- ● Response in high-vulnerability state (median EME)
- ● Response in low-vulnerability state (median EME)

Financial conditions · Industrial production · Consumer prices
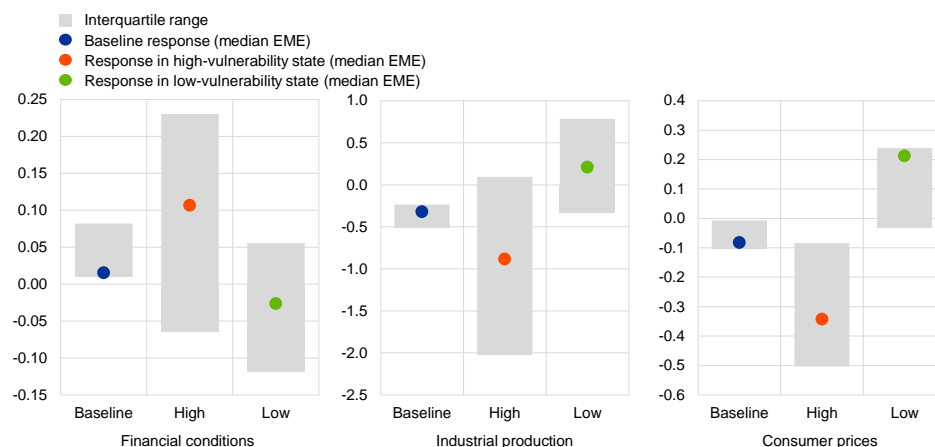
Sources: Haver Analytics, Refinitiv, Jarociński and Karadi (op. cit.), Georgiadis and Jarociński (op. cit.) and ECB calculations.
Notes: This chart shows the responses of dependent variables in log terms for economies with differing levels of vulnerability. Using a monthly state-dependent local projections framework (based on Auerbach and Gorodnichenko, op. cit.), we report median estimates for the baseline specification (blue dots), a high-vulnerability state (red dots) and a low-vulnerability state (green dots). The grey bars show the interquartile ranges, indicating the heterogeneity of responses. Responses have been scaled to show the impact of a pure monetary policy shock originating in the United States that results in a 1 standard deviation change in the yield on the underlying financial instrument (five-year US Treasury bonds). In the left-hand panel, higher values indicate tighter financial conditions.

Moreover, EMEs' domestic monetary policy stances also help to shape their responses to US monetary policy shocks. In the current global tightening cycle, many EMEs started raising interest rates considerably earlier than the United States. This may partly reflect improvements to policy frameworks, with many central banks now having greater independence and more credible mandates to target price stability. At the same time, EMEs' central banks need to carefully calibrate their policy responses to the current macroeconomic environment, countering risks to their hard-won credibility while also taking account of the key role that supply shocks have played in the global spike in inflation.

As a result of the rapid rate increases observed so far, many EMEs' policy rates are close to the levels implied by estimates of their monetary policy reaction functions. The monetary policy reaction function provides a basic but useful benchmark indicator of how central bank policy rates in an EME typically react to changes in expected inflation and output and the cyclical position of the economy (among other things) on the basis of coefficients estimated using regression analysis. Chart C shows how actual central bank policy rates compare with those benchmarks, with positive values indicating that monetary policy is tighter than estimates of a central bank's reaction function would imply, and vice versa. This shows that, despite recent supply shocks and the severity of the spike in inflation, central bank policy rates in most of the EMEs in the sample are now consistent with their typical reaction functions.[4]

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4   This follows a period of looser policy introduced in response to the COVID-19 pandemic.

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Chart C

Comparing EMEs' policy rates with the levels implied by their central bank reaction functions

(index)

The impact of monetary policy shocks originating in the United States can be mitigated by prudent domestic monetary policy in EMEs. Our empirical results suggest that when an EME's monetary policy is at least as tight as that implied by estimates of its central bank reaction function, spillovers from US monetary policy to financial conditions and industrial production are typically more limited (green dots in Chart D), relative to a situation where monetary policy is looser than the reaction function would suggest (red dots in Chart D).

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Chart D

The impact of contractionary US monetary policy shocks on EMEs by monetary policy stance

(peak responses; percentage points)

Interquartile range
● Baseline response (median EME)
● Response in looser state (median EME)
● Response in tighter state (median EME)
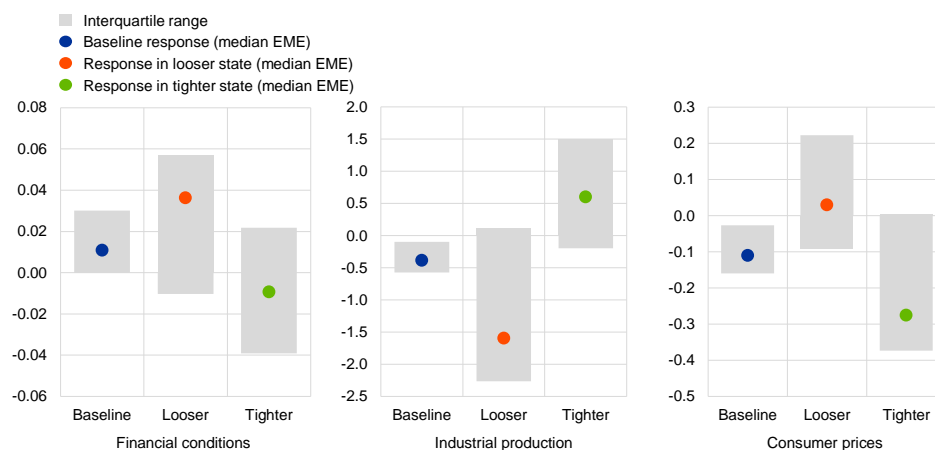
Sources: Haver Analytics, Refinitiv, Jarociński and Karadi (op. cit.) and ECB calculations.
Notes: This chart shows the responses of dependent variables in log terms depending on economies' monetary policy stances relative to their central bank reaction functions. Using a monthly state-dependent local projections framework (based on Auerbach and Gorodnichenko, op. cit.), we report median estimates for the baseline specification (blue dots), a state where policy rates are below the levels implied by central bank reaction functions (red dots) and a state where policy rates are above the levels implied by central bank reaction functions (green dots). The grey bars show the interquartile ranges, indicating the heterogeneity of responses. Responses have been scaled to show the impact of a pure monetary policy shock originating in the United States that results in a 1 standard deviation change in the yield on the underlying financial instrument (five-year US Treasury bonds). In the left-hand panel, higher values denote tighter financial conditions.

Overall, our empirical analysis suggests that EMEs' sensitivity to spillovers from US monetary policy can be amplified or attenuated by macro-financial vulnerabilities and domestic monetary policy actions. Many EMEs are currently facing the same kinds of inflationary pressures and supply shocks as advanced economies. Their central banks have participated in – and are even somewhat ahead of – the current global tightening cycle, striving to maintain their credibility and keep inflation anchored. This contrasts with the tightening cycle that occurred after the global financial crisis, when advanced economies' central banks were the first to start tightening. Our findings suggest that maintaining a prudent policy stance helps to mitigate spillovers from US monetary policy. They also suggest that EMEs' lower vulnerability relative to the past could be helping to shield them from stress, although there is some cross-country heterogeneity in this regard.

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2 Oil price developments and Russian oil flows since the EU embargo and G7 price cap

Prepared by Jakob Feveile Adolfsen, Rinalds Gerinovics, Ana-Simona Manu and Adrian Schmith

New sanctions on Russia's oil exports have come into effect in recent months, including EU bans on seaborne oil imports from Russia and price caps on Russian oil in response to Russia's continuing war of aggression in Ukraine. The EU ban on seaborne imports of Russian crude oil entered into force on 5 December 2022, followed by the embargo on refined oil products as of 5 February 2023. In tandem with the EU embargoes, the G7, the EU and partner countries have also prohibited the provision of maritime services[1] for Russian crude oil shipments and for Russian oil products, unless the oil is being purchased at or below a capped price.[2] The oil price cap for Russian crude oil was set at USD 60 per barrel, which is currently above the market selling price for the majority of Russian crude oil exports. Two price cap levels were imposed on refined products: one at USD 100 per barrel for petroleum products traded at a premium to crude oil, such as diesel, kerosene and gasoline; and one at USD 45 per barrel for petroleum products traded at a discount to crude oil, such as fuel oil and naphtha. The price cap mechanism is intended to restrain Russian oil revenues by capping the price, while still allowing the supply of Russian oil to the global market, thereby avoiding spikes in international oil prices. This box provides an initial assessment of the impact of the new sanctions on international oil prices and Russian seaborne oil exports.

Russia had already redirected much of its oil supply before the EU embargo and the G7 price cap entered into force. Russia exported around 8 million barrels of oil per day to a broad variety of trading partners before its invasion of Ukraine. Two-thirds of these exports were composed of crude oil and one-third of refined oil products, which collectively were carried mainly by sea (Chart A, panel a). Less than one-third of oil exports was transported to customers via pipelines. Deliveries to the EU accounted for almost half of Russia's oil exports at the beginning of 2022, but trade patterns changed significantly over the course of the year. The announcement in June of an upcoming EU embargo and "self-sanctioning" behaviour by European customers led to Russia's seaborne crude oil exports to the EU falling by almost 70% (1.4 million barrels per day) between February and November 2022. Russia redirected these exports mainly to Asian countries (Chart A, panel b), leaving the aggregate volume of Russian seaborne crude oil exports broadly unchanged. In particular, more crude oil was exported to China and India, with their collective share of Russian oil exports rising to approximately 70% in November 2022 (before the

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[1] Including trading and commodities broking, financing, shipping, insurance (including protection and indemnity), flagging and customs broking.

[2] The G7, the EU and Australia together form the Price Cap Coalition, while Albania, Bosnia and Herzegovina, Iceland, Liechtenstein, Montenegro, North Macedonia, Norway, Switzerland and Ukraine have all pledged to follow EU sanctions against Russia.

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new sanctions regime came into effect on 5 December 2022), compared with just below 20% in the pre-war period.

Chart A

Evolution of Russian oil exports as war-related sanctions entered into force

a) Russia's total oil exports by type and mode of delivery

(million barrels per day)

- Total
- Seaborne crude
- Pipeline crude
- Seaborne oil products
- Pipeline oil products
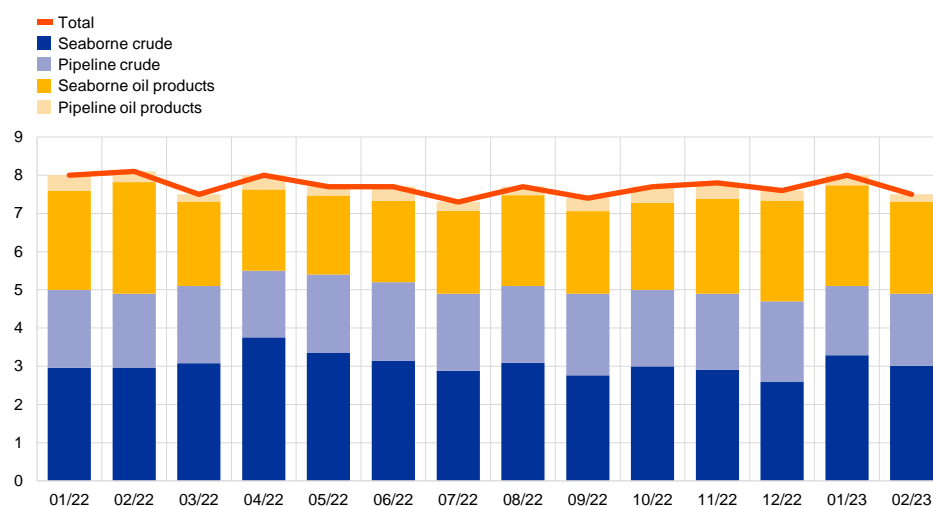
b) Russian seaborne crude oil exports before the war and around the EU embargo implementation date

(million barrels per day)

- China
- India
- Other countries
- Unknown
- Total

- European Union
- Other countries
- Total

Non-sanctioning countries

Sanctioning partners

The new sanctions initially led to a notable drop in Russia's seaborne exports of crude oil, but volumes have since recovered. During the first weeks after 5

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December 2022, Russian seaborne crude oil exports fell by 35% as flows to the EU declined sharply.[3] Exports to India, China and Türkiye also declined when the new sanctions entered into force, although these countries did not join the oil price cap mechanism. However, following the initial slump, crude oil exports have since recovered. The recovery reflects a further redirection of crude oil from sanctioning countries to non-sanctioning countries, although the available statistics are incomplete as a significant amount of Russian crude oil is categorised as loaded onto tankers with undisclosed destinations. In total, Russia's export volumes of seaborne crude oil have, on average, remained practically unchanged since the implementation of crude oil sanctions when compared with the export volumes in November 2022.

Global oil prices have exhibited limited volatility despite the introduction of the EU crude oil embargo and the crude oil price cap. Since 5 December 2022 international oil prices have decreased (by 9%). Model estimates suggest that oil supply has contributed negatively to oil prices (Chart B), which can be explained by the relatively small impact on volumes of Russian seaborne crude oil exports when compared with initial expectations of more significant declines. At the same time, other factors might be at play, such as higher production in Kazakhstan and Nigeria, which also supported global oil supply during the period. These developments stand in contrast to the oil price evolution in the immediate aftermath of the Russian invasion of Ukraine when concerns about global oil supply shortages were the main driver of the spike in oil prices seen during the spring of 2022 amid fears of disruptions to oil supplies from Russia.

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[3] Small amounts of crude oil were still arriving in Bulgaria, which is temporarily exempted from the embargo. It is likely that exports to other EU countries after 5 December are related to implementation exemptions as ships loaded before the embargo date could still deliver Russian oil.

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Chart B

Oil price developments

Model-based decomposition of changes in Brent crude oil prices

(daily accumulated percentage changes)

● Oil price
█ Risk to growth
█ Economic activity
█ Supply
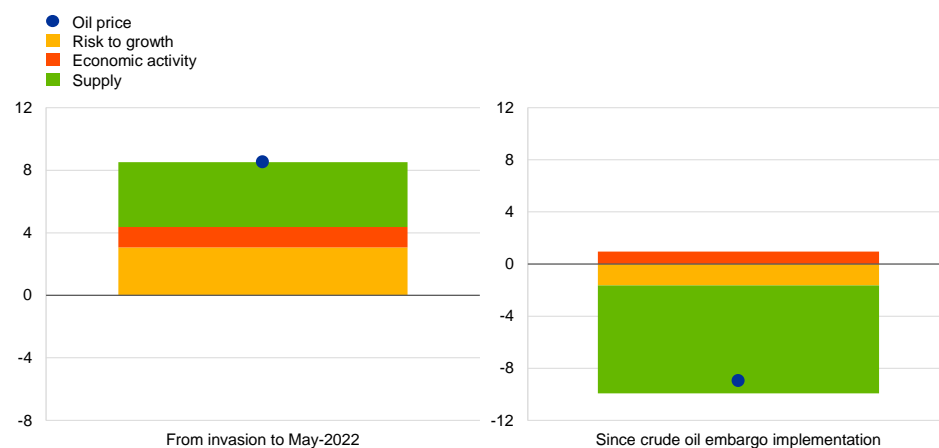
Sources: Refinitiv and ECB staff calculations.
Notes: The daily oil model from Venditti, F. and Veronese, G., "Global financial markets and oil price shocks in real time", *Working Paper Series*, No 2472, ECB, September 2020, is used. Structural shocks are estimated using the spot price, the futures/spot spread, market expectations of oil price volatility and the stock price index. The risk component identifies uncertainty regarding growth and oil demand, whereas the economic activity component identifies shocks to current demand from changes in economic activity. 24 February 2022 is taken as the date of the Russian invasion of Ukraine. The crude oil embargo was implemented on 5 December 2022. The latest observations are for 14 March 2023.

Russian oil continued to be traded at a discount. Urals oil – the main grade of crude oil exported from Russia to Europe – has been sold at a large discount to Brent crude since the Russian invasion of Ukraine because many European firms have refrained from buying it. Before the invasion, the Brent/Urals spread was small, at around USD 3 per barrel, but it subsequently increased to around USD 35 per barrel. Immediately after the implementation of the new sanctions on Russian crude oil, the discount increased, but later returned to the levels seen before December 2022.[4] In contrast, the market price of the Russian Eastern Siberia-Pacific Ocean (ESPO) grade oil, which is traditionally exported to Asia, has been closer to international oil prices and stayed at levels above the oil price cap. This may reflect the fact that around 45% of Russian oil exports to eastern Asia are transported via pipelines to China, which are not affected by sanctions from the G7 and EU countries. In addition, ESPO oil has usually been shipped by tankers flagged in countries outside the G7 and EU, which makes it easier to transport Russian ESPO grade oil without being subject to the new sanctions.

Russia's exports of refined oil products declined somewhat as new measures came into effect. In contrast to crude oil exports, Russia had only redirected limited volumes of refined oil products from the EU to other countries since the invasion of Ukraine, indicating that the redirection of refined oil exports to other countries could be more challenging for Russia than the redirection of seaborne crude oil (Chart C, panel a). One reason for this might be that China and India, countries which attracted large amounts of crude oil from Russia, are net exporters of a large range

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[4] We focus on the price without freight and insurance costs, since the price cap refers to the price excluding transportation costs. In particular, the prices for Urals crude oil given here are free-on-board in Primorsk prices as quoted by Refinitiv.

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of refined oil products. Following the announcement of sanctions back in June 2022, Russia's exports of refined oil products gradually increased, driven by flows to Africa and Asia, but with the implementation of sanctions on 5 February 2023 flows declined notably. However, since then Russia has been able to offset the reduction in imports by EU Member States by further increasing exports to Africa and other undisclosed destinations. Overall, compared with January 2023, the aggregate exports of refined oil have decreased by only 3% since the implementation of sanctions.

Chart C

Developments in the refined oil market

a) Russian seaborne exports of refined oil products by destination

(million barrels per day, 10-day moving average)

- Africa
- European Union
- Unknown
- Türkiye
- Rest of the world
- China and India
- Total
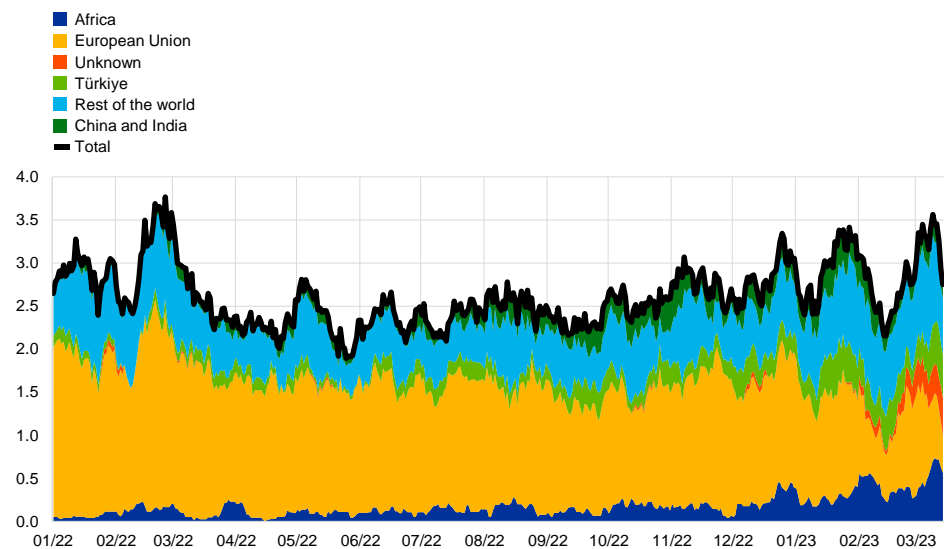
b) European crack spreads

(USD per barrel)

- Gasoline
- Diesel

Sources: Refinitiv and ECB staff calculations.
Notes: Refined oil products are diesel and gasoil, gasoline components, jet fuel, kerosine and naphtha. Crack spreads are the difference between the prices of crude oil and the corresponding refined oil product. The latest observations are for 14 March 2023 for both panels.

The European diesel market remains tight despite the EU bolstering Its refined oil imports ahead of 5 February. The EU increased its imports of refined oil

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products significantly towards the turn of the year, reflecting more trade with the Middle East and Asia as well as a frontloading of fuel oil and diesel imports from Russia ahead of the embargo. Europe's dependence on Russian diesel has led to persistent worries about supply shortages, as reflected in a sharp increase in the spread between diesel and crude oil prices – also known as the "diesel crack spread" – since the start of the Russian war in Ukraine (Chart C, panel b). In the weeks around 5 February, the EU's aggregate diesel imports declined sharply, yet crack spreads also narrowed, suggesting that the initial decline was anticipated by the market. A global fall in diesel prices following from a recovery in inventories also contributed to the decline in crack spreads. Nonetheless, the European diesel market remains tight, with crack spreads higher than before the onset of the war.

A stronger impact of sanctions on global oil markets could still materialise.
First, the price cap on crude oil might have a stronger impact on Russian crude oil exports in the coming months, as sanctioning partners aim to keep the level of the cap at least 5% below the market price for Russian oil. Future reassessments of the price cap level could test whether the sanctions are working as intended, particularly as Russia officially prohibited exports of oil to countries that join the cap mechanism as of February and more than 60% of Russian crude oil flows from the Baltic Sea and the Black Sea are still being insured by sanctioning countries.[5] Russia has already announced a reduction in oil production starting in March 2023 in response to the implementation of the sanctions, corresponding to around 0.5% of global crude oil supply. Second, the embargo and the corresponding price cap mechanism on refined oil products are still at an early phase of implementation,[6] implying that there is still high uncertainty about the ultimate impact on refined oil product markets. Over time the embargo may add additional price pressures in an already tight European diesel market, with the EU having to bid for barrels of diesel from the United States and the Middle East in competition with those suppliers' traditional customers.

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[5] See the Centre for Research on Energy and Clean Air's "Weekly snapshot – Russian fossil fuels 6 to 12 February 2023".

[6] The implementation of the price cap on refined oil includes a 55-day wind-down period for seaborne Russian petroleum products purchased at above the price cap, provided they are loaded onto a vessel at the port of loading prior to 5 February 2023 and unloaded at the final port of destination prior to 1 April 2023.

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3 Friend-shoring global value chains: a model-based assessment

Prepared by Maria-Grazia Attinasi, Lukas Boeckelmann and Baptiste Meunier

In recent years, geopolitical considerations have started to play an increasing role in global trade relations. While criticism of globalisation pre-dated the coronavirus (COVID-19) pandemic, geopolitical tensions have strengthened, particularly in the face of the pandemic and Russia's invasion of Ukraine. The global trade disruptions experienced since 2020 have raised concerns over the resilience of supply chains and reinforced discussions about economic security. As a result, some countries have started taking supply chain measures aimed either at "reshoring" (bringing production home) or "friend-shoring" (sourcing inputs from suppliers in allied countries) in order to secure access to critical production inputs (for example China's "dual circulation" strategy, the US Chips Act, and the European Union's (EU's) "open strategic autonomy").[1]

A scenario in which global values chains (GVCs) are reshaped in response to concerns about economic security could result in a reversal of global trade integration. In this box we use a stylised, model-based analysis to quantify the potential economic effects of a hypothetical scenario of global trade fragmentation. In line with recent developments in the academic literature and using rising geopolitical tensions between the United States and China as an illustrative example, we consider the decoupling of the global economy into an Eastern bloc and a Western bloc.[2] In this scenario, countries are mechanically allocated to each bloc according to their voting patterns in the United Nations (UN) General Assembly.[3] In this

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[1] Under the "dual circulation" policy adopted in 2020, China aims (i) to vertically integrate production and achieve self-reliance supported by its huge domestic market and (ii) to globalise China's home-grown companies. The EU's "open strategic autonomy" refers to the capacity of the EU to act autonomously in strategically important policy areas; notably in the economy by ensuring the resilience of the EU industrial system and its supply of critical inputs. The US Chips Act of 2022 creates large subsidies and incentives for the research, development and production of technological components in the United States.

[2] Such a scenario is modelled in, for example, Góes, C. and Bekkers, E., "The impact of geopolitical conflicts on trade, growth, and innovation", *Staff Working Paper*, No ERSD-2022-09, World Trade Organization, June 2022; Felbermayr, G., Gans, S., Mahlkow, H. and Sandkamp, A., "Decoupling Europe", *Kiel Policy Brief*, No 153, Kiel Institute for the World Economy, July 2021; and Felbermayr, G., Mahlkow, H. and Sandkamp, A., "Cutting through the Value Chain: The Long-Run Effects of Decoupling the East from the West", *Kiel Working Papers*, No 2210, Kiel Institute for the World Economy, March 2022. A similar scenario is also used in Chepeliev, M., Maliszewska, M., Osorio-Rodarte, I., Seara e Pereira, M.F. and van der Mensbrugghe, D., "Pandemic, Climate Mitigation, and Reshoring: Impacts of a Changing Global Economy on Trade, Incomes, and Poverty", *Policy Research Working Paper*, No 9955, World Bank, March 2022; and Cerdeiro, D., Kothari, S. and Redl, C., "Asia and the World Face Growing Risks From Economic Fragmentation", *IMF Blog*, October 2022.

[3] Country groups mirror the country allocation in Góes and Bekkers, op. cit. Countries are allocated to geopolitical blocs in a data-driven and mechanical way based on UN voting provided by the Foreign Policy Similarity (FPS) database in Hage, F., "Chance-Corrected Measures of Foreign Policy Similarity (FPSIM Version 2)", *Harvard Dataverse*, 2017. We use voting in the year 2015 to allocate the countries to the blocs. The allocation to blocs is robust to using other years of the FPS (2000, 2005 or 2010) and to using more recent UN votes, for example the April 2022 vote on the suspension of Russia from the UN Human Rights Council. Ultimately, the resulting allocation broadly mirrors the division into advanced and developing economies. This approach follows similar studies in the literature that relied on UN voting to distinguish geopolitical similarities, such as Góes and Bekkers, op. cit.; and Campos, R., Estefania-Flores, J., Furceri, D. and Timini, J., "Trade fragmentation", *mimeo*, 2023.

fragmentation scenario we assume that trade (as a share of GDP) in intermediate inputs between the two blocs reverts back to the level of the mid-1990s (i.e. before sweeping trade liberalisation policies were implemented).[4] We target trade in intermediates only, rather than final products, as most of the measures recently adopted by countries have focused on reshoring/friend-shoring GVCs. Finally, we assume that this fragmentation scenario is achieved by means of higher non-tariff barriers to trade between blocs (for example in the form of regulations or standards) rather than tariffs – reflecting the scope of most recent trade policies.

The economic effects of trade fragmentation are quantified using a state-of-the-art multi-country, multi-sector model developed by Baqaee and Farhi.[5] This model allows the non-linear effects of higher trade barriers to be derived for a sample of 41 countries (or country groups) and 30 sectors.[6] Our focus is on the effects on welfare, trade in intermediate products and prices, both from a global perspective and for the two blocs.[7] A key advantage of this model is that, by featuring sectoral interlinkages, it accounts for amplification effects of trade shocks through production networks as well as substitution effects via international trade. The model considers the endogenous reactions of producers and consumers to a trade shock in an interconnected global economy. The transmission operates primarily through the price channel: higher barriers to trade increase import prices. As a result, producers within each bloc substitute away from more expensive "foreign" inputs, thereby generating a demand shock for upstream suppliers, resulting in lower trade flows between the blocs. This also leads to adjustments in production structures within the blocs and changes in the demand for factors of production (capital and labour). As the prices of capital and labour adjust, disposable incomes of households and consumption patterns also change. These substitution and re-allocation channels generate general equilibrium effects on prices, demand and supply, which in turn affect trade, production and welfare in both blocs.

General equilibrium effects can be obtained using two different model setups – rigid and flexible – which can be viewed as akin to the short-run and long-run impacts respectively. The propagation channels of the trade shock discussed above are captured in the model via three main parameters: (i) elasticity of

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[4] More specifically, the trade shock is calibrated such that the model-implied trade in intermediates between blocs (as a share of global GDP) matches the level observed in the data from the mid-1990s. Historical figures are based on the long-run World Input-Output Tables (WIOT) of Timmer, M., Dietzenbacher, E., Los, B., Stehrer, R. and de Vries, G., "An Illustrated User Guide to the World Input-Output Database: The Case of Global Automotive Production", *Review of International Economics*, Vol. 23(3), August 2015, pp. 575-605. The Baqaee and Farhi model is calibrated on the 2017 Asian Development Bank Input-Output Table. The calibrated magnitude of the shock is a 20% increase in non-tariff trade barriers (iceberg trade costs).

[5] Baqaee, D.R. and Farhi, E., "Networks, Barriers, and Trade", *Econometrica*, forthcoming, 2023. For an application of a similar model to the impact of the energy price shock, please see the box entitled "Who foots the bill? The uneven impact of the recent energy price shock" in this issue of the Economic Bulletin.

[6] The sample includes all sectors of the economy, including manufacturing, services, construction, energy, mining and agriculture.

[7] It should be noted that the model-based quantifications reflect general equilibrium responses of relative prices. Results are presented relative to the initial steady state. The model does not include an expectation channel for inflation. The model features a central bank which reacts to the inflationary effect of a trade cost shock by dampening demand to contain price pressures.

substitution across production inputs,[8] (ii) ease of reallocation of production factors across sectors,[9] and (iii) degree of wage rigidity. We calibrate two polar setups. The *flexible* setup allows for flexible wages and high substitutability of inputs and factors of production, as in the recent literature.[10] This setup elicits a relatively muted response of the global economy as it allows consumers and producers to substitute seamlessly across products, factors of production to be shifted to sectors that face higher demand, and wages to be adjusted. In contrast, the *rigid* setup features sticky wages and a low substitutability of inputs and factors of production.[11] As a result, this setup generates a stronger reaction from the substitution and re-allocation channels, as the ability of a country/bloc to immediately adjust is more limited as a result of low factor mobility and less room to substitute away from more expensive inputs. The resulting drop in domestic production and household income is therefore greater, and so the disruption to the supply of intermediate inputs for downstream sectors and to demand for upstream producers is stronger. This reflects the amplification mechanism of global production networks. In addition, in the presence of sticky wages the economy adjusts to temporary fluctuations in demand (domestic and/or foreign) by shedding employment (not reducing wages), which weighs on consumption. Given that rigidities tend to be more binding in the short term, the *rigid* setup could be seen as a close approximation of short-run effects, whereas the *flexible* setup is closer to the long-run equilibrium.[12] In this respect, the results can also be viewed in terms of the transition from the short-run effects (*rigid* setup) to the long-run effects (*flexible* setup). Beyond this interpretation, these two setups also take into account the high level of uncertainty surrounding substitution elasticities in the literature.

In a trade fragmentation scenario, losses in trade flows between the blocs would not be fully compensated for by trade diversion within blocs, causing net trade losses. Trade fragmentation along these hypothetical geopolitical lines could result in real imports declining between 12% (*flexible* setup) and 19% (*rigid* setup), mainly driven by a fall in trade in intermediates (which would drop between

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8 The Baqaee and Farhi model does not allow different substitution elasticities to be applied across countries. However, the higher substitutability of goods produced within an economically integrated region (e.g. the euro area) is reflected in the model via higher input-output covariances, which in turn allow producers to switch more easily to goods produced within an integrated economic area following a trade shock.

9 The same does not apply to countries since factors of production are not mobile across countries in the Baqaee and Farhi model. In the model, factors of production are capital and low, medium and high-skilled labour.

10 Elasticities of substitution are taken from Atalay, E., "How Important Are Sectoral Shocks?", *American Economic Journal: Macroeconomics*, Vol. 9, October 2017, pp. 254-80, in which a range of estimates are provided. Elasticities in the *rigid* and *flexible* setups, respectively, are taken from the lower and upper 10% of this range. It should be noted that, in both setups, the model-based quantification reflects general equilibrium responses. Trade models such as the Baqaee and Farhi model do not provide the dynamics of the adjustment.

11 In the Baqaee and Farhi model, sticky wages are modelled as constant wages (no evolution). Under this setup, the economy adjusts through the quantity of labour (employment). This is the opposite of the baseline working of the model in which wages respond endogenously but the quantity of each production factor is fixed and exogenous.

12 More specifically, the long-run impact on trade can be viewed as occurring at least 6 to 8 years after the shock, as in Peter, A. and Ruane, C., "The Aggregate Importance of Intermediate Input Substitutability", *2019 Meeting Papers*, No 1293, Society for Economic Dynamics, 2019. For the duration of sticky wages (around one year), this estimate is based on Taylor, J., "Aggregate Dynamics and Staggered Contracts", *Journal of Political Economy*, Vol. 88(1), February 1980, pp. 1-23, as well as the empirical and theoretical studies based on it.

19% and 25%), as shown in Chart A (panel a). Trade in final goods would also decline between 1% and 9%, despite not being the direct target of the trade barriers. This reflects reduced welfare of, and demand from, households and substitution away from foreign-produced, GVC-intensive final goods, whose price has increased, and towards final goods produced domestically or within the bloc. The decline in intermediate trade reflects a recomposition of production input sourcing by companies. Chart A (panel b) presents diversion effects for intermediates inputs. The decline in imports of intermediate inputs between blocs is only partially compensated for by a rise in imports within blocs and domestic sourcing rises more substantially, thereby weighing on trade.

Chart A

Real imports and sourcing of intermediate inputs

a) Global imports by type of trade

(percentage deviation from steady state)
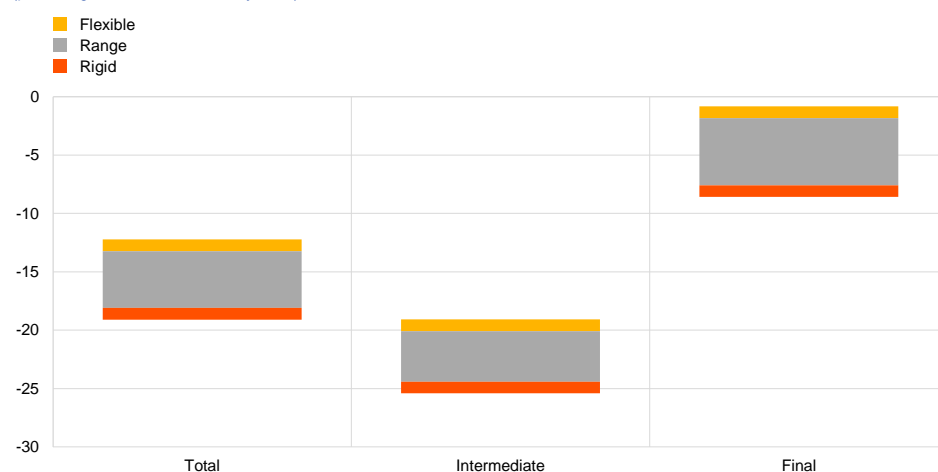
b) Sourcing of intermediate inputs (world)

(percentage points, market share)
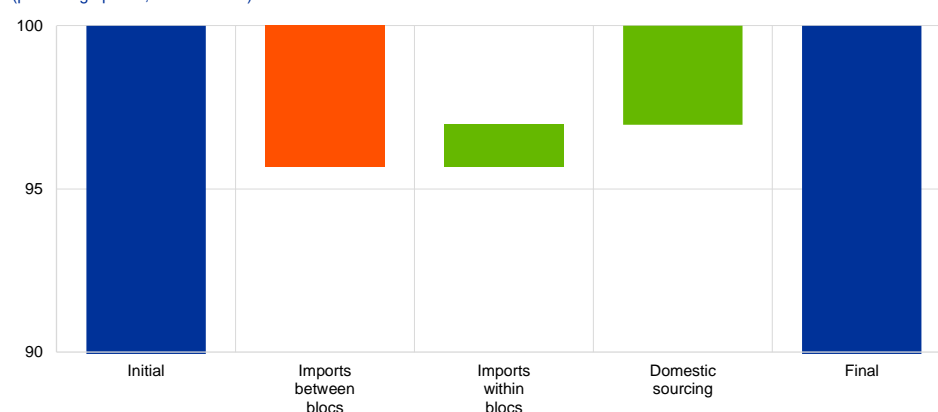
Sources: Baqaee and Farhi, Asian Development Bank, FPS database and ECB calculations.
Notes: Non-linear impact simulated through 25 iterations of the log-linearised model. In panel a) the grey areas indicate the range between the *flexible* setup (yellow line) and the *rigid* setup (red line) and provide an illustration of the scope of the effects associated with the trade shock. Panel b) refers to the *flexible* setup. In panel b) the red bar indicates losses in market share while the green bars indicate gains in market share.

Welfare losses can be sizeable, albeit rather heterogenous across economies.
From a global perspective, welfare losses, captured by the change in gross national expenditure (GNE), are estimated to range between 0.9% (*flexible* setup) and 5.3%

(*rigid* setup) (Chart B, panel a). In line with the interpretation discussed above, this suggests that losses could be sizeable in the near term should a sharp correction in trade flows take place (*rigid* setup). Once the rigidities dissipate, losses are gradually absorbed as substitute inputs of production are found either via increased domestic production or increased intra-bloc trade. This in turn increases employment and reduces the price of foreign inputs, limiting the losses from trade fragmentation in the long run (*flexible* setup). Chart B (panel b) presents welfare losses for selected countries. Welfare losses vary widely across economies and range between 0.2% and 6.9% in the *flexible* setup and between 0.4% and 10.5% in the *rigid* setup. While all countries lose from fragmentation, countries that rely heavily on GVCs and trade extensively with the other bloc experience the largest losses. This contrasts with large economies, such as the United States and China, which see smaller losses even in the *rigid* setup. Losses in the euro area are also relatively mild as, like the United States and China, its large internal market more easily allows substitution by domestic intermediate inputs after the shock. Nonetheless, its losses are somewhat greater than those of the United States or China owing to the greater trade openness of the euro area. The estimated effects in the *flexible* setup are broadly in line with the recent literature, which finds muted effects of trade fragmentation in the long run.[13] In the short run, however, trade fragmentation may also involve significant transition costs (*rigid* setup) as it takes time to reconfigure supply chains.

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[13] For instance, the International Monetary Fund (IMF) estimates that an East-West decoupling would decrease World GDP by 1.5% (see "Sailing into Headwinds", *Regional Economic Outlook: Asia and the Pacific*, IMF, October 2022). Felbermayr, Mahlkow and Sandkamp, op. cit., find that a decoupling between China and the West would result in welfare losses of between 1.0% and 3.6%. Góes and Bekkers, op. cit., estimate global welfare losses of 5% in an East-West decoupling scenario. Welfare losses of between 1.6% and 6.2% in a Chinese-led decoupling are estimated in Lim, B., Yoo, J., Hong, K. and Cheong, I., "Impacts of Reverse Global Value Chain (GVC) Factors on Global Trade and Energy Market", *Energies*, Vol. 14(12), June 2021, p. 3417. Quantitatively, welfare losses in the *flexible* setup can be lower than in some recent studies. However, this reflects the fact that we model the fallouts from a return of intermediate goods trade between geopolitical blocs to levels observed in the 1990s, while most of the recent literature focuses on the more disruptive scenario of a full shutdown of trade between blocs.

Chart B

Change in gross national expenditure

a) Global

(deviation from steady state, percentages)

■ Flexible
■ Range
■ Rigid
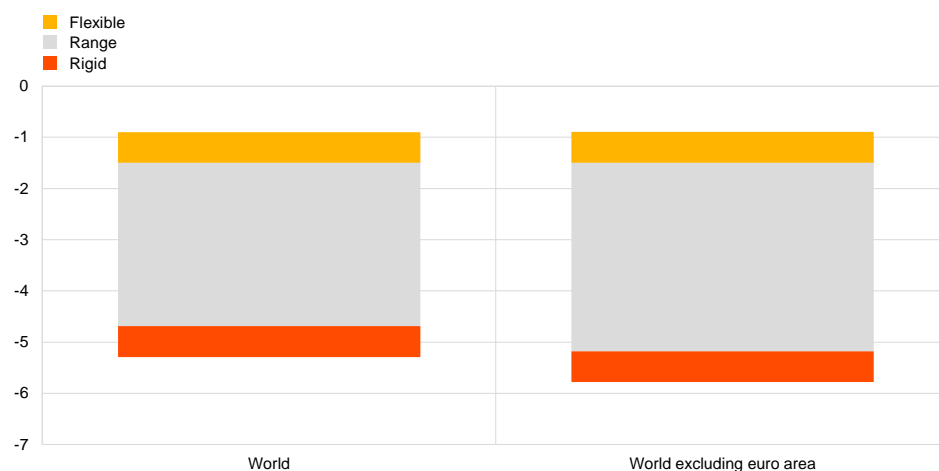
b) Individual countries

(deviation from steady state, percentages)
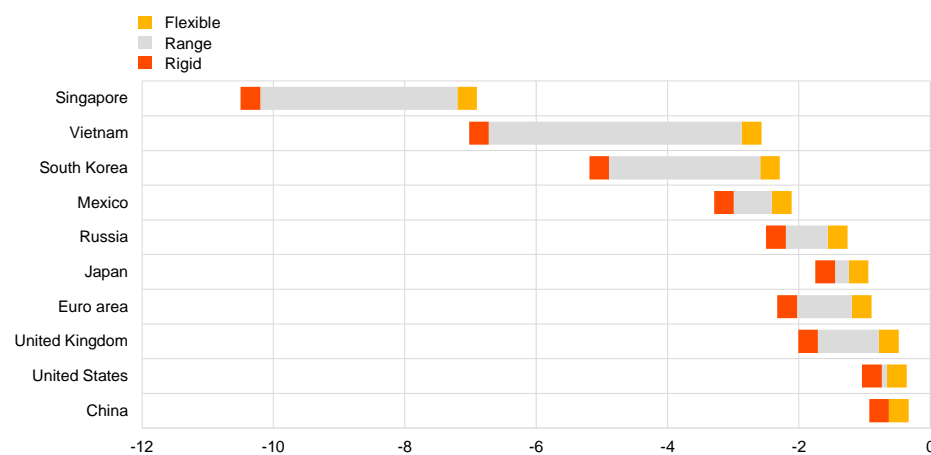
■ Flexible
■ Range
■ Rigid

Sources: Baqaee and Farhi, Asian Development Bank, FPS database and ECB calculations.
Note: The non-linear impact is simulated through 25 iterations of the log-linearised model. In both panels, the grey areas indicate the range between the *flexible* setup (yellow line) and the *rigid* setup (red line) and provide an illustration of the scope of the effects associated with the trade shock.

A fragmentation of value chains along geopolitical lines would generate price effects, as producers would have to substitute away from cheaper foreign inputs. The impact on prices is a combination of the import price shock and the reallocation effects discussed above. This is reflected in the cross-country heterogeneity of the price response (Chart C, panel a). At a global level, the increase in the level of consumer prices ranges between 0.9% (*flexible* setup) and 4.8% (*rigid* setup), whereas for the United States the range is between 1.7% and 4.9%.[14] For the euro area the smaller price increases compared to other large countries is explained by smaller upward price pressures from relocation effects. Trade fragmentation also has a distributional impact reflected in the relative evolution of

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[14] Because wage growth is, by design, zero in the rigid scenario, the increase in the level of consumer prices is equivalent to a decrease in real wages. As regards the central bank reaction function, see footnote 7.

wages for low, medium and high-skilled workers. Chart C (panel b) shows the evolution of wages for medium-skilled workers. In the Western bloc, trade fragmentation redistributes income towards low-skilled workers, whose wages evolve more favourably than those of high-skilled workers.[15] This reflects the fact that, amid rising trade fragmentation, Western countries would import fewer goods with low-skilled labour inputs from the Eastern bloc, thereby increasing demand and wages for low-skilled labour in the Western bloc. Conversely, in the Eastern bloc, wages of low-skilled workers fall relative to high-skilled labour.

Chart C

Nominal impact of trade fragmentation

a) Consumer prices

(deviation from steady state level, percentages)
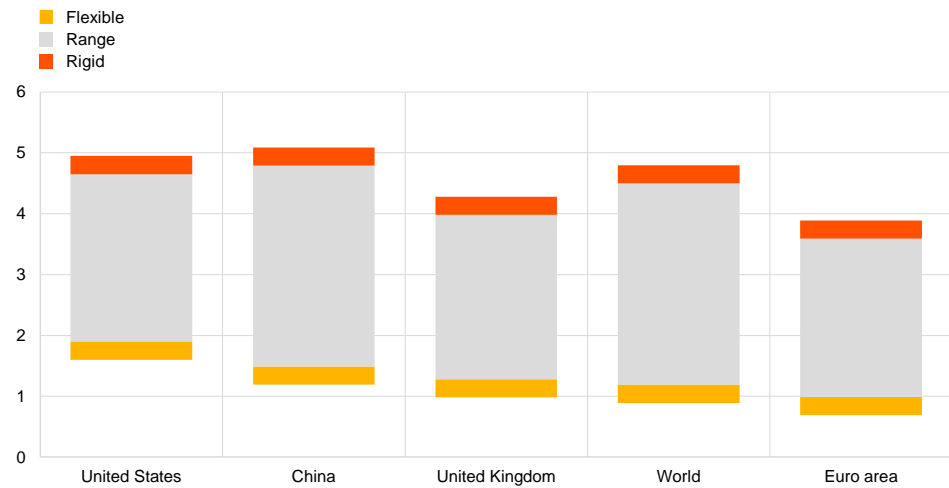
b) Wages

(deviation from steady state level relative to medium-skilled labour, percentage points)
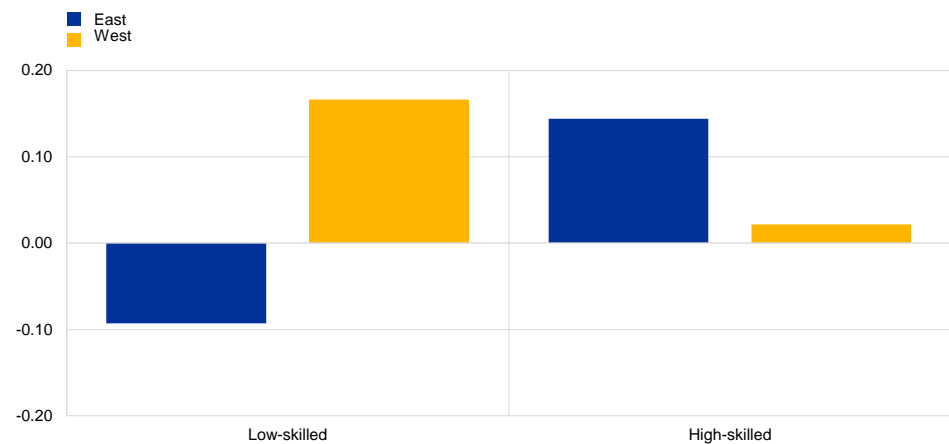
Sources: Baqaee and Farhi, Asian Development Bank, FPS database and ECB calculations.
Notes: Non-linear impact simulated through 25 iterations of the log-linearised model. In panel a) the grey areas indicate the range between the *flexible* setup (yellow line) and the *rigid* setup (red line) and provide an illustration of the scope of the effects associated with the trade shock. Panel b) refers to the *flexible* setup.

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[15] The positive impact on high-skilled labour wages (relative to medium-skilled labour wages) in the Western bloc is mainly driven by a few countries within the bloc which initially have a lower share of high-skilled labour and for which friend-shoring leads to an increase in demand.

The estimates presented in this box are subject to uncertainty, as the future path of trade fragmentation remains largely unpredictable and other amplification effects could materialise which are not considered here. The estimates are strongly influenced by the magnitude and extent of any decoupling scenario. A scenario in which the East-West decoupling is limited to strategic sectors (cars, machinery, electronics, metals) yields a substantially lower impact, with global GNE losses ranging between 0.5% and 2.5%. In contrast, a scenario combining East-West decoupling with an intra-bloc decoupling for strategic sectors would increase the impact by about one third.[16] The composition of blocs could also differ from our mechanical allocation based on UN voting, notably as some countries could stay non-aligned. In the short term, other factors beyond sticky wages and low substitutability could drive even larger losses, for example the presence of critical inputs that are difficult to substitute (e.g. lithium or rare minerals) which could lead to temporary production stoppages, or financial amplification mechanisms (for example in the form of rising risk premia). In the longer run, transmission channels not considered in this box, such as cross-border knowledge diffusion, could also weigh on growth.

In conclusion, from a purely economic perspective, trade fragmentation would be a lose-lose situation given the costs it entails at both the global and the country level. While the above estimates are subject to both upside and downside risks (depending on the magnitude and scope of any fragmentation scenario), from a purely economic perspective, trade fragmentation would entail sizeable costs in terms of substantially distorted trade, decreased welfare and higher prices. Beyond the results presented in this box, academic evidence suggests that reshoring may increase economic vulnerabilities, since risk-sharing and diversification would be reduced.[17]

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[16] This alternative scenario features (non-tariff) barriers to trade in intermediates between the two blocs across all sectors – as in the baseline scenario. On top of this, it adds similar (non-tariff) barriers to trade in intermediates between regional free-trade areas (USMCA, MERCOSUR, the EU, RCEP) in strategic sectors (cars, machinery, electronics, metals).

[17] See, for instance, Bonadio, B., Huo, Z., Levchenko, A. and Pandalai-Nayar, N., "Global supply chains in the pandemic", *Journal of International Economics*, Vol. 133, 2021; and "Shocks, risks and global value chains: insights from the OECD METRO model", Organisation for Economic Cooperation and Development, June 2020.

4 Global value chains and the pandemic: the impact of supply bottlenecks

Prepared by Laura Lebastard and Roberta Serafini

This box analyses how the pandemic affected global value chains. It uses data for France, in particular between September 2020 and December 2021 when supply bottlenecks emerged.[1] The pandemic resulted in a contraction of demand and supply that occurred both domestically and internationally. For this reason, firms engaged in international trade were exposed to international disruptions on top of domestic ones: a reduction in supply resulted in shortages of intermediate inputs for importing firms, which coincided with weaker foreign demand for exporting firms. Firms involved in global value chains ("GVC" firms), namely firms that both import and export, faced both of these challenges simultaneously. Anecdotal evidence shows that the constrained availability of key inputs acted as a drag on the production capacity of firms involved in global value chains and therefore on their exports, for instance in the case of the availability of microchips in the automotive industry.[2] This box, based on highly granular trade data for the full universe of French firms, shows that participation in global value chains increased firms' vulnerability to the economic implications of the pandemic. The results can be informative for developments in the euro area in general, as the dynamics of French exports during the pandemic, as well as their exposure over time to supply bottlenecks, were similar to those observed for the euro area as a whole in terms of the timing and size of the adjustment.[3]

Unlike during the global financial crisis, during the pandemic GVC firms experienced a larger drop in exports compared with other exporters, suggesting that supply value chains can be either a source of vulnerability or a source of resilience, depending on the nature of the crisis. For the purpose of this box, firms that exported every month during the six months before the outbreak of the pandemic and imported at least once during the same period are considered GVC firms. At the onset of the COVID-19 crisis, firms involved in global production networks experienced the sharpest fall in exports and, after the economic reopening, recovered at a slower pace than other exporters (Chart A, panel a). In April 2020, exporters involved in global value chains recorded a decline in their export values of 42% compared with January 2020. For other exporters, the cumulative decline was less drastic, reaching a trough in May 2020 of 28% below the level recorded in January 2020. The two groups of exporters diverged further when pandemic-related

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1   This box is partially based on Lebastard, L., Matani, M. and Serafini, R., "GVC exporter performance during the COVID-19 pandemic: the role of supply bottlenecks", *Working Paper Series*, No 2766, ECB, January 2023.

2   See the box entitled "Motor vehicle sector: explaining the drop in output and the rise in prices", *Economic Bulletin*, Issue 7, ECB, 2022.

3   France has a similar composition of firms in international trade to other euro area countries. In particular, two-way traders make up a relatively low share of the total number of companies engaged in trade, but they account for the vast majority of total trade in terms of value (see Eurostat, "Globalisation patterns in EU trade and investment", 2017 edition). The sourcing countries are also similar (see Marin, D., Schymik, J. and Tscheke, J., "Europe's export superstars – it's the organisation!", *Working Papers*, No 2015/05, Bruegel, July 2015).

restrictions were lifted in the summer of 2020. By March 2021, exporters not involved in global value chains had reached their January 2020 levels and by September 2021 had recovered well beyond their pre-pandemic levels, while it took until December 2021 for GVC firms to exceed their January 2020 export levels. During the 2008 global financial crisis, however, firms involved in global value chains proved more resilient (Chart A, panel b). Compared with the COVID-19 crisis, the 2008 collapse in international trade was less sizeable and less abrupt, although it was more persistent.

Chart A

Export values of firms

a) Global financial crisis

(total exports, base month (August 2008) = 100)
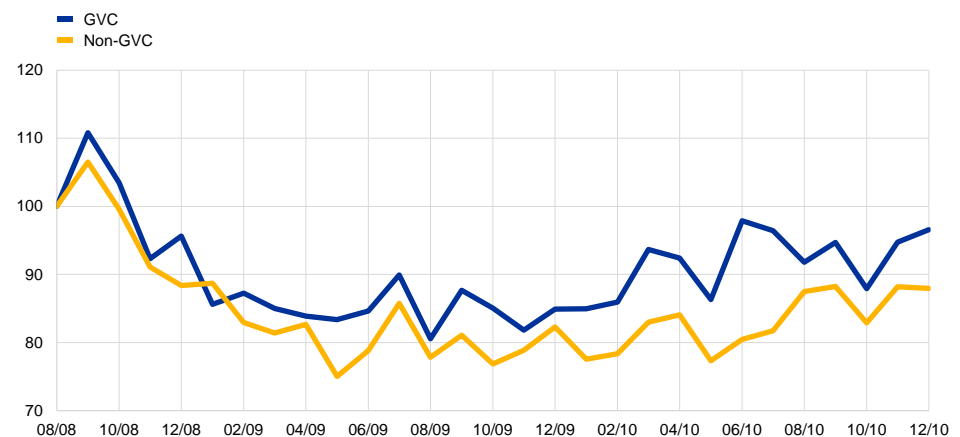
b) COVID-19 crisis

(total exports, base month (January 2020) = 100)
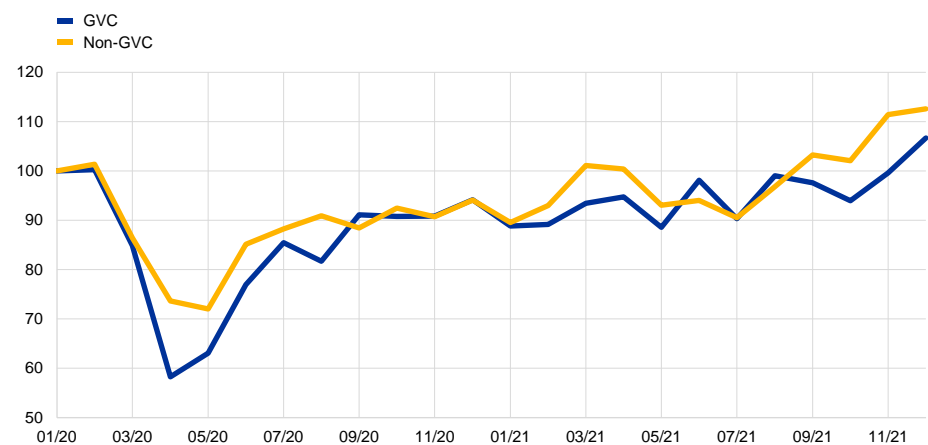
Sources: Direction générale des douanes et droits indirects and authors' own calculations.
Note: The chart is based on firm-level data for France.

Empirical analysis confirms that GVC firms' exports were relatively strongly affected by the pandemic, in particular following the rise of supply bottlenecks in September 2020. An event study comparing both types of exporters illustrates the emergence, in April and May 2020, of the first negative and sudden effect of being part of a global value chain during the COVID-19 crisis, and a new decline in exports

from October 2020 that was more progressive and persistent (Chart B, blue line).[4] The first drop in exports of GVC firms relative to other exporters took place in April, while the Chinese lockdown started in January. This lagged impact might be explained by the time it takes for a cargo ship to travel from China to France (six weeks). This delayed the propagation of the crisis and the negative effect on the stocks of intermediate inputs among firms involved in global value chains, allowing them to maintain their production for a short time. The blue line in Chart B shows the difference in export values between GVC and non-GVC firms between September 2020 and December 2021 and can be interpreted as a firm-level-based measure of supply disruptions. The evolution of this line is very similar to that of other indicators normally used to monitor bottlenecks (e.g. indicators based on supply delivery times, shipping costs or equipment shortages).

Chart B

Bottleneck indicators for international trade and difference in export values between GVC and non-GVC firms

(z-score)

- Estimated difference in export values between GVC and non-GVC firms (right-hand scale)
- PMI supplier delivery times
- Ocean freight shipping cost – HARPEX (inverted)
- Equipment shortages (inverted)
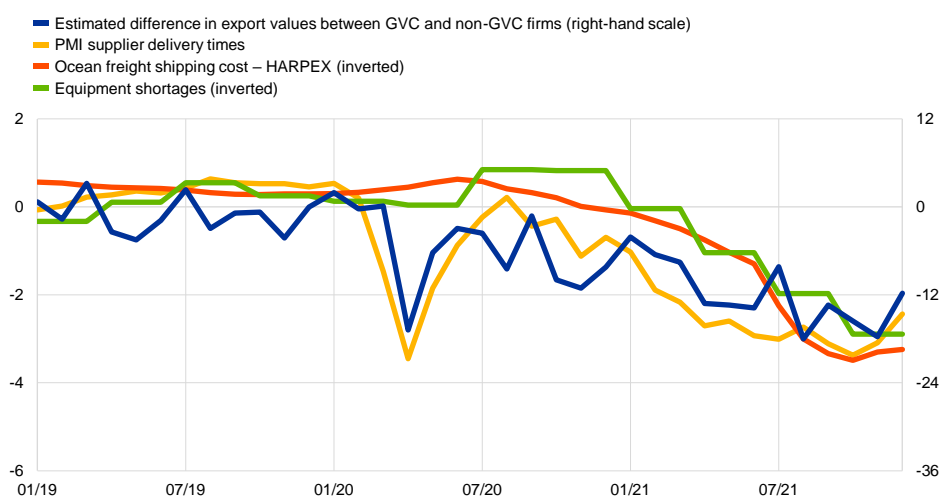
Sources: Direction générale des douanes et droits indirects, Markit, S&P Global, Harper Petersen, European Commission and authors' own calculations.
Notes: All the indices were normalised using z-scores over the period from January 2000 to October 2022. An increase in the score for PMI supplier delivery times for all goods and intermediate goods signifies an improvement (i.e. a reduction in delivery times). The Harper Petersen Charter Rates Index (HARPEX) reflects worldwide price developments on the charter market for container ships. The European Commission measures equipment shortages as a factor limiting production in terms of the percentage of respondents reporting an increase minus the percentage of respondents reporting a decrease. All bottleneck indicators relate to France, except for HARPEX, which is global.

Exporters that source their imports from geographically closer destinations were less affected by supply bottlenecks than those importing from further afield. Firms with higher shares of inputs imported from other EU countries were less affected during the lockdown phase than firms that relied more on inputs from the rest of the world (Chart C, panel a). Furthermore, firms involved in global value

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[4]   Chart B shows the estimated β_j, computed as in Lebastard, L., Matani, M. and Serafini, R., op. cit., using the following econometric specification, where the dependent variable is the natural logarithm of exports: $\ln export_{it} = \sum_{j=-12}^{24} \beta_j \, COVID19_{jt} \times \text{GVC}_i + FE_i + FE_t + \varepsilon_{it}$. The treatment group features all GVC firms in the pre-pandemic period (i.e. both importing and exporting), while the control group is made up of the other exporters. The econometric model controls for the size of the firms by including firm-fixed effects, and for time-specific shocks by using time-fixed effects. The reference point is December 2019. The database includes the full universe of exporting firms in France, while occasional exporters in the pre-pandemic period were dropped.

chains importing mostly from the EU were hit later by supply bottlenecks, with the negative effects being visible only from April 2021. Between September 2020 and December 2021, export losses among firms importing from further afield were twice as big as those experienced by firms importing from the EU. Conversely, firms with the greatest reliance on inputs from China were the most affected for the same period (Chart C, panel b), possibly due to the more stringent and protracted lockdown in China and the longer delivery times for sea freight from Asia.

Chart C

Differences in export values between GVC firms depending on the sourcing countries for their imported inputs

a) European Union

(coefficients and 95% confidence intervals)
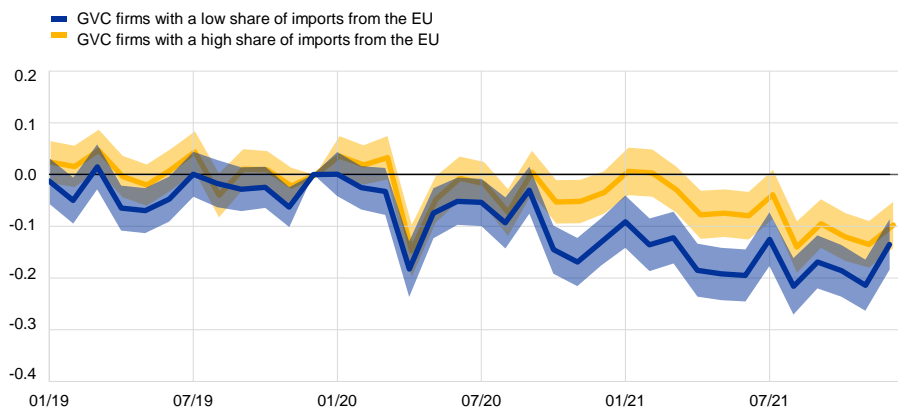
b) China

(coefficients and 95% confidence intervals)
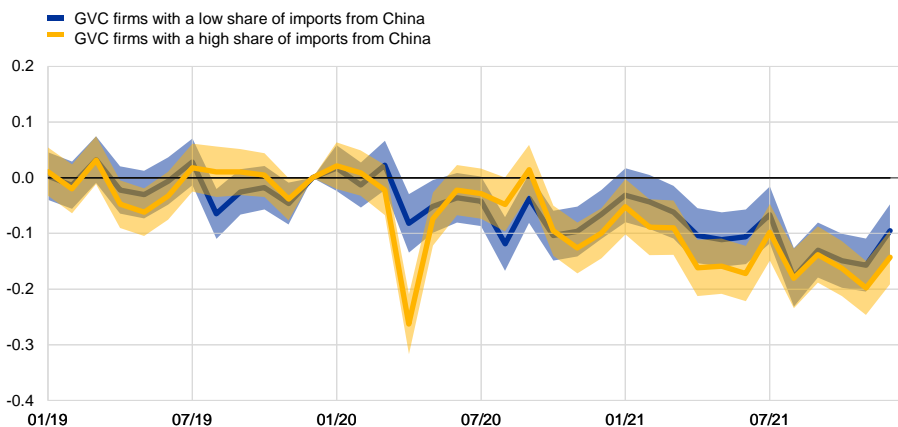
Notes: This is an event study using a similar setting to the blue line in Chart B. The regression of the event study is as follows:
$\ln export_{it} = \alpha + \sum_{j=-12}^{24} \beta_j\, Covid_{jt} * \text{GVC}_i * \text{LowShare}_i + \sum_{k=-12}^{24} \beta_k\, Covid_{kt} * \text{GVC}_i * (1 - \text{LowShare}_i) + FE_i + FE_t + \varepsilon_{it}$. LowShare takes the value 1 if the share of goods imported from the country is below the median (among GVC firms) in the six months before the pandemic, while HighShare is the opposite. The reference point is December 2019.

A stylised calculation based on the above estimates suggests that the supply disruptions can explain a decline in exports that is approximately equivalent to 1% of euro area nominal GDP in 2020 and 2% in 2021. This calculation involved combining the elasticity derived from Chart B with country indicators of firms' global value chain participation in the other euro area countries in order to calculate an estimate of the implications of COVID-19 and the associated supply bottlenecks for

euro area exports.[5] The figures produced by this calculation are in line with previous ECB analysis for the euro area using macroeconomic data.[6] The impact of supply bottlenecks is likely to have varied significantly across euro area countries given the differences in global value chain participation among these countries.

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[5] The share of GVC firms' exports in total exports is calculated based on estimates in Lebastard, L., Matani, M. and Serafini, R., op. cit. These are estimates for France (95% of exports come from GVC firms) and they are extended to the other euro area countries by rescaling the "GVC backward participation" index of the OECD's TiVa database. Total exports by GVC firms are then calculated as the share of GVC firms' exports in total exports of each country in December 2019. Assuming that the results for France are representative for the euro area as a whole, the elasticity shown in panel a of Chart C is then applied to total exports of GVC firms in each month for every country to calculate the total drop in exports due to supply bottlenecks. This decline is then divided by each country's GDP and annualised to obtain the annual impact of bottlenecks on exports as a share of GDP.

[6] See the box entitled "The impact of supply bottlenecks on trade", *Economic Bulletin*, Issue 6, ECB, 2021.

5 Who foots the bill? The uneven impact of the recent energy price shock

Prepared by Niccolò Battistini, Alina Bobasu and Johannes Gareis

The recent surge in euro area energy prices led to a significant deterioration in the energy terms of trade. This deterioration (defined as the ratio of export to import prices) induced a cumulative loss of 2.4 percentage points of GDP between the third quarter of 2021 and the third quarter of 2022, the largest five-quarter loss on record since the launch of the euro (Chart A, red dot).[1] So how did this loss spread across households and firms? To assess the uneven impact of the recent rise in the price of imported energy in the euro area, this box takes a two-step approach. First, it uses disaggregated data to disentangle the effects of the recent energy terms-of-trade deterioration on final expenditures and aggregate income, allocating the implied purchasing power losses across the household income distribution. Second, the box uses structural models to identify the energy price shock underlying the recent terms-of-trade deterioration and to gauge its direct, indirect and second-round effects on the overall economy.[2] Throughout the box, variables are expressed in nominal terms.

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[1] For details on the calculation of the terms of trade, see the box entitled "Implications of the terms-of-trade deterioration for real income and the current account", *Economic Bulletin*, Issue 3, ECB, 2022.

[2] The direct effects are the result of an immediate link between the specific expenditure/income components and imported energy, while the indirect effects capture the transmission of the energy price shock via the production and distribution chain. Second-round effects occur when agents change their consumption or investment behaviour in response to the shock or pass on the energy price effects to wage and price setting, depending on broader economic, institutional or policy features. The taxonomy of the different effects on the overall economy mirrors the taxonomy of the different effects of energy price hikes on inflation. See, for example, the box entitled "Wage share dynamics and second-round effects on inflation after energy price surges in the 1970s and today", *Economic Bulletin*, Issue 5, ECB, 2022.

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Chart A

Energy terms-of-trade effects on GDP

(cumulative changes, percentage points of GDP)

- Effects on final expenditures
- Effects on aggregate income
- Energy terms-of-trade effects
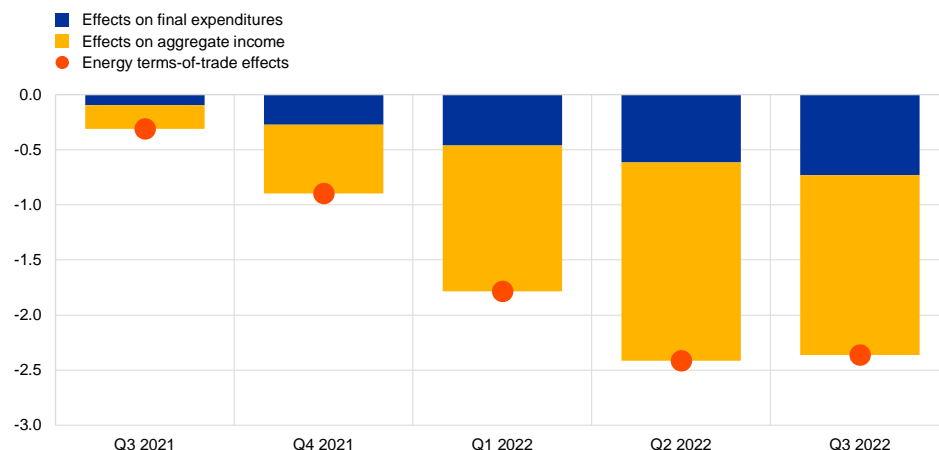
Sources: Eurostat and ECB calculations.
Notes: The energy terms-of-trade effects are calculated by weighting export and import energy price changes by the share of exports and imports of energy in GDP (all in nominal terms). The effects on final expenditures and aggregate income are further separated using disaggregated information from annual input-output tables on the import content of expenditures. Specifically, the import contribution of the energy terms of trade is first decomposed based on the share of energy imports for private consumption, government consumption, total investment, inventories and intermediate inputs out of total energy imports. The effects on final expenditures are the negative of the sum of import contribution of private consumption, government consumption, total investment and inventories. The effects on aggregate income are the difference between the export contribution and the import contribution of intermediate inputs. The latest observations are for the third quarter of 2022.

The energy terms-of-trade effects reflected a loss in aggregate income and, to a lesser extent, a surge in final expenditures for private consumption. The effects of rising energy prices and subsequent changes in the terms of trade on GDP are calculated as the difference between the impact on exports of domestic energy and the impact on imports of foreign energy for intermediate inputs and final expenditures. As higher final expenditures for energy also raise GDP, the effects of rising energy prices on GDP through final expenditures cancel out in net terms. Hence, the net impact on exports and imports through intermediate inputs measures the remaining effect on aggregate income. Owing to the lack of granular quarterly data, these effects through expenditures and income can be disentangled only with disaggregated information from annual input-output tables that show the energy import content of expenditures.[3] On this basis, the energy terms-of-trade loss from the third quarter of 2021 to the third quarter of 2022 was reflected in lower aggregate income by 1.7 percentage points of GDP and in higher final expenditures by 0.7 percentage points of GDP (Chart A, bars), almost entirely due to private consumption.[4]

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[3] The energy import content is calculated based on Eurostat's FIGARO world input-output (sector-by-sector) tables between 2010 and 2020. Import and export data for the euro area account for intra- and extra-euro area flows, in line with the national accounts concept. The expenditure breakdown is composed of private (including households and non-profit institutions) consumption, government consumption, total investment (including inventories), exports and imports. The quarterly time series are obtained via linear interpolation (up to 2020) and constant extrapolation (before 2010 and after 2020) of the annual time series.

[4] The relative composition of domestic expenditures on imported energy between final expenditures and intermediate inputs is consistent with findings reported for oil in the box entitled "Oil prices, the terms of trade and private consumption", *Economic Bulletin*, Issue 6, ECB, 2018.

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Households' different exposures to fluctuations in energy costs and aggregate income imply a relatively larger impact of the energy price surge on lower-income households. Energy exposures vary significantly across income groups, as households in the bottom quintile spend 12% of their disposable income on electricity, gas and heating, while households in the top quintile spend only 4%. Income elasticity also differs significantly across households, as labour income is less cyclical and represents the main source of income for lower-income households, while non-labour income is more cyclical and mainly affects higher-income households.[5] Combined with the effects on private consumption and aggregate income from the analysis above, these energy exposures and income elasticities indicate that, as a share of their income, households in the bottom quintile experienced purchasing power losses twice the size of those in the top quintile between the third quarter of 2021 and the third quarter of 2022 (Chart B). Together with the relatively thin liquidity buffers of lower-income households,[6] this points to the conclusion that these households bore the brunt – relative to their income – of the energy price surge, despite fiscal measures providing some relief.[7]

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[5]   The quintile-specific income elasticities are obtained by multiplying the elasticity of wages (employee income) and profits (operating surplus, property income and self-employed income) to aggregate income by the quintile-specific share of wages and profits out of total income, respectively. Wage elasticities reflect the worker betas estimate by Lenza, M. and Slacalek, J., "How does monetary policy affect income and wealth inequality? Evidence from quantitative easing in the euro area", *Working Paper Series*, No 2190, ECB, October 2018, and are also in line with the measures in the box entitled "Household income risk over the business cycle", *Economic Bulletin*, Issue 6, ECB, 2019. Profit elasticities are assumed to be equal to unity. The shares of wages and profits out of total income are obtained from experimental statistics produced by Lamarche, P., Oehler, F. and Riobóo, I., "European household's income, consumption and wealth", *Statistical Journal of the IAOS*, Vol. 36, No 4, November 2020, pp. 1175-1188.

[6]   The median saving rate as a percentage of household disposable income is higher in higher-income quintiles. While low-income households dissave, with a median saving rate of around -5.8% of disposable income at the bottom income quintile, those in the top income quintile save around 40% of their disposable income (according to Eurostat's experimental statistics on income, consumption and wealth).

[7]   For more details on the impact of the energy/inflation compensatory fiscal measures on households' income, see Box 2 in the article entitled "Fiscal policy and high inflation" in this issue of the *Economic Bulletin*. In this box, income measures only relate to the energy compensatory fiscal measures. They are simply redistributed using households' direct exposure to energy consumption and they account for the imported energy content of household consumption (10%). Price measures are redistributed across income quintiles based on energy exposures, similar to the approach in Box 2 of the above-mentioned article.

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Chart B

Household net effects of the change in energy terms of trade resulting from the recent energy price shock

(cumulative change between third quarter of 2021 and third quarter of 2022, percentage points of disposable income)

- Effect on aggregate income
- Effect on private consumption
- Fiscal income measures
- Fiscal price measures
- Net effect
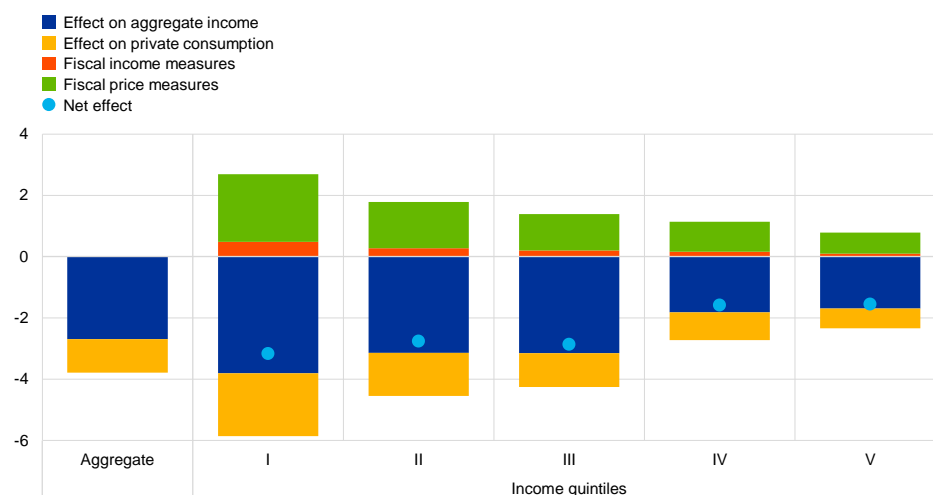
Sources: Eurostat and ECB calculations.
Notes: The energy terms-of-trade effects on household consumption and aggregate income were calculated on the basis of Eurostat's latest FIGARO input-output tables. The expenditure effects and the fiscal measures are allocated by using the share of disposable income spent on imported energy, based on information from the experimental statistics on income, consumption and wealth. The aggregate income effects reflect the exposure of households across the income distribution to labour income (wages) and non-labour income (profits, property income and self-employed income), based on information from the experimental statistics on income and consumption from social surveys and national accounts. Net effects refer to the overall impact on aggregate income and private consumption, net of the effects of (income and price) fiscal measures.

Structural models can be used to assess the overall impact of the energy price shock, going beyond the observed effects through the energy terms of trade.
The energy terms of trade are only a first gauge of the impact of energy price shocks for two reasons: first, they react to many other shocks, and second, they are only one of several channels through which energy price shocks propagate. In what follows, structural economic models are used to assess the direct, indirect and second-round economic effects of the recent energy price shock on the overall economy. First, a production network model is used to disentangle the direct and indirect effects of the shock through global supply chains in the presence of a limited input elasticity of substitution.[8] Structural vector autoregression (SVAR) models then estimate the overall impact of the shock based on historical regularities, taking into

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[8]   The production network model assumes that shocks propagate forward to prices and backward to sales, accounting for cross-input complementarity along supply chains. The shock is assumed to be a negative technology shock, hitting non-euro area energy sectors in proportion to their share of global output. Since the shock is proxied by the quarter-on-quarter percentage change in euro area energy import prices (consistent with the econometric model below), the model elasticity of the shock is standardised to produce a 1 percentage point increase in euro area energy import prices. The elasticity of substitution is assumed to be 0.7, within the range of estimates from 0.5 to 0.9 documented in the literature. The specification and calibration of the production network model corresponds to the case of the roundabout economy without inefficiencies as described by Baqaee, D.R. and Farhi, E., "Networks, Barriers, and Trade", *Econometrica*, forthcoming, 2023. For an application of the model to the global economic effects of trade fragmentation, see the box entitled "Friend-shoring GVCs: a model-based assessment [ADD LINK]", in this issue of the Economic Bulletin.

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account second-round effects arising from changes in agents' behaviour, price and wage formation and policy actions.[9]

The production network model shows that the direct and indirect effects mainly impacted private consumption on the expenditure side and non-energy sectors on the income side. The direct effects – reflecting the impact on prices and quantities induced by the sectoral exposures to non-euro area energy – weighed on net exports through higher energy imports on the expenditure side and favoured the energy sector through higher sales on the income side (Chart C). However, the indirect effects – including the full pass-through of energy prices and substitution away from expensive energy goods – especially hit private consumption on the expenditure side. Furthermore, these indirect effects induced losses, particularly for non-energy companies on the income side, notably energy-intensive sectors, such as intermediate goods and transport services, and central sectors, such as professional and technical activities. Overall, the production network model shows that indirect effects amplified the direct effects by about half, from -0.6 to -0.9 percentage points of GDP (Chart C, solid lines), between the third quarter of 2021 and the third quarter of 2022.[10]

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[9] The models considered contain the same set of core variables, supplemented by variables from the expenditure or income side of GDP and sectoral disposable income. The core variables include the energy import-related income losses for the euro area, a global economic conditions index, the euro area effective exchange rate, euro area real GDP, the GDP deflator, the private consumption deflator and a short-term interest rate. The models are estimated with data from the first quarter of 1999 to the fourth quarter of 2019 to avoid the extraordinary macroeconomic fluctuations of the coronavirus (COVID-19) pandemic having an impact on the estimated model parameters. All data except interest rates are expressed as percentage changes compared with the previous quarter. For the global conditions index, see Baumeister C., Korobilis, D. and Lee, T.K., "Energy Markets and Global Economic Conditions", *The Review of Economics and Statistics*, Vol. 104, No 4, 2022, pp. 828-844. The short-term interest rate is proxied by the shadow short rate estimated by Wu, J.C. and Xia, F.D., "Time-Varying Lower Bound of Interest Rates in Europe", Chicago Booth Research Paper No 17-06, 2017.

[10] In the range of alternative calibrations reported in the literature for the elasticity of substitution from 0.5 to 0.9, the direct and indirect effects vary from -1.5 to -0.3 percentage points of GDP respectively, without significantly affecting the distribution across expenditure, income and sectoral components.

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Chart C

Direct and indirect effects of the recent energy price shock on the overall economy

(cumulative change between third quarter of 2021 and third quarter of 2022, percentage points of GDP)
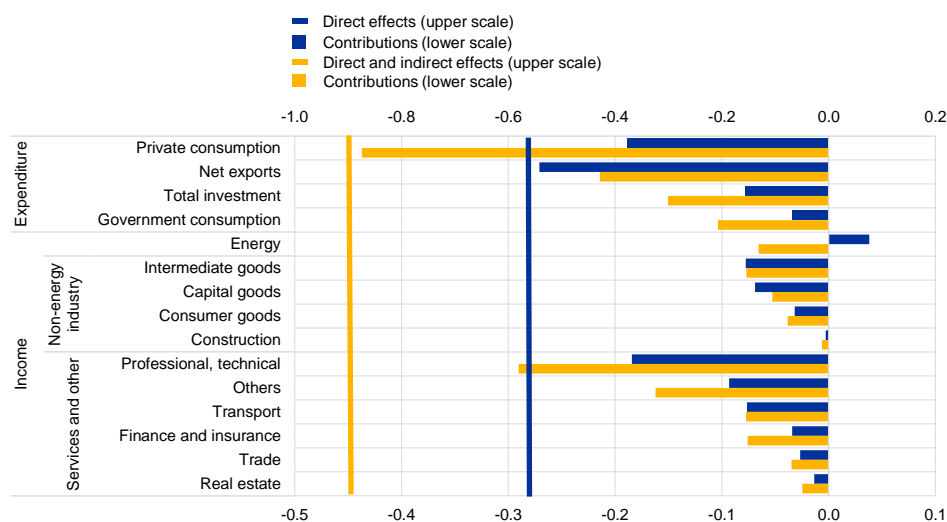
Sources: Eurostat and ECB calculations.
Notes: The direct and the indirect elasticity of the different components to imported energy supply shocks is based on a production network model with data between the third quarter of 2021 and the third quarter of 2022. The sector aggregation reflects Eurostat's end-use categories (Main Industrial Groupings, MIGs), based on the NACE2 classification, with adjustments depending on the sector breakdown available in FIGARO industry-by-industry world input-output tables. In particular, "Energy" refers to sectors B, C19, D35, E36, "Consumer goods" to C10-C12, C13-C15, C18, C21, C31-C32, "Intermediate goods" to C16, C17, C20, C22, C23, C24, C27, "Capital goods" to C25, C26, C28, C29, C30, C33, "Construction" to F, "Trade" to G45, G46, G47, "Transport" to H49, H50, H51, H52, H53, "Finance and insurance" to K, "Real estate" to L, "Professional, technical" to M69-M70, M71, M72, M73, M74-M75, N77, N78, N79, N80-N82, "Others" to the remaining sectors.

The econometric models suggest that the overall impact was widely spread across expenditure components and mainly felt through profits on the income side, while the government partially shielded private sector disposable income. Looking at the income breakdown of GDP, the shock inflicted substantial losses on profits and, to a lesser extent, labour income from the third quarter of 2021 to the third quarter of 2022 (Chart D). Labour income losses were mainly driven by changes in employment, suggesting a more buoyant increase in employment in the absence of the energy price shock over the same period. The results also suggest that public sector intervention played a significant role in cushioning the negative impact on the private sector. This is reflected in the substantial loss in the disposable income of governments relative to that of households and firms. On the expenditure side, the overall loss of GDP was attributable to all expenditure components, and in particular to private consumption, followed by business investment. Compared with the direct and indirect effects above (Chart C), these results suggest that second-round effects significantly altered the distributional consequences of the energy price shock on the expenditure side, spreading the effects more evenly across private consumption and investment. The SVAR models point to the recent price energy shock having an overall impact of -1.5 percentage points of GDP from the third quarter of 2021 to the third quarter of 2022 (Chart D, solid line).

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Chart D

Overall effects of the recent energy price shock on the general economy

(cumulative change between third quarter of 2021 and third quarter of 2022, percentage points of GDP)
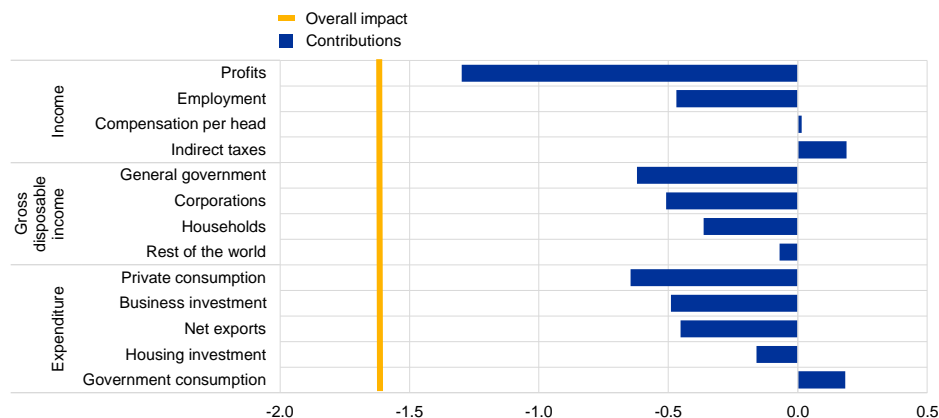
Sources: Eurostat, Baumeister et al., Wu and Xia, ECB and ECB calculations.
Notes: The chart shows SVAR model-based results of the effects of the recent energy price shock for three different decompositions of nominal GDP. Specifically, for each breakdown, the models estimate the impact of the recent energy price shock on GDP and its components. The impact on the components is then rescaled by their average share of GDP over the sample period. The contribution of indirect taxes, the rest of the world (the global economy outside the euro area) and net exports is calculated as the residuals between the total GDP effects and the sum of the estimated contributions of the modelled components. For the sake of exposition, the GDP effects are averaged across the models, with the contribution of components scaled accordingly. The models identify an energy price shock by assuming that the shock leads to an increase in the energy import-related income losses for the euro area and a decline in real GDP as well as an increase in the GDP and private consumption deflators, with the latter increasing more than the former. Since the variables from the expenditure or income side of GDP and sectoral disposable income are not constrained in the estimations, the direction and magnitude of these responses are determined by the data. For details on the model variables, see footnote 9. "Profits" refers to gross operating surplus and mixed income, while "Business investment" refers to non-construction investment.

Overall, this box finds that the recent energy price shock weighed especially on lower-income households and non-energy companies, despite support from governments. The box highlights the key role of disaggregated data for assessing and quantifying the effects of the change in the energy terms of trade on final expenditures and aggregate income. Moreover, the analysis indicates that indirect and second-round effects largely shaped the distributional implications of the recent energy price shock. Despite a moderation of energy price pressures in recent months, the effects of the recent energy price shock may continue to unfold in the near term as the economy gradually adjusts.

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6 Results of the 2022 climate risk stress test of the Eurosystem balance sheet

Prepared by Maximilian Germann, Piotr Kusmierczyk and Christelle Puyo

In 2022 the ECB conducted a climate risk stress test of the Eurosystem balance sheet as part of its action plan to include climate change considerations in its monetary policy strategy.[1] The aims of this exercise were to (i) analyse the sensitivity of the Eurosystem's financial risk profile to climate change; and (ii) enhance the Eurosystem's climate risk assessment capabilities. The scope of the exercise covered a number of the Eurosystem's monetary policy portfolios, namely its holdings of corporate bonds, covered bonds, asset-backed securities (ABSs), as well as its collateralised credit operations.

This climate risk stress test used scenarios developed by both the Network of Central Banks and Supervisors for Greening the Financial System (NGFS) and the ECB. It employed three NGFS Phase II long-term scenarios[2] that project macro-financial and climate variables over a 30-year horizon. The scenarios differ in terms of the extent to which climate policies are assumed to have been implemented (primarily in the form of a carbon tax) and the different types of climate risk that are expected to materialise as a result. The hot house world scenario entails severe physical risk but does not lead to transition risk, as it is based on the assumption that climate policies are not enforced. Under the disorderly transition scenario, the implementation of climate policies is delayed, leading to severe transition risk but only limited physical risk. The risks stemming from the disorderly transition and hot house world scenarios are analysed against those arising from the orderly transition scenario, which assumes that climate policies are implemented in a timely manner. In addition, the stress test exercise considered two further short-term scenarios designed by ECB staff: a flood risk scenario, which includes severe physical hazards materialising over a one-year horizon; and a short-term disorderly transition scenario, which frontloads sharp increases in carbon prices over a short-term (three-year) horizon. In view of the challenges associated with designing long-term climate scenarios, these two short-term scenarios provided useful additional input to the analysis, with the flood risk scenario setting out how a severe physical hazard could potentially materialise across the whole of Europe.

The methodology and scope of the exercise were aligned with the 2022 climate risk stress test[3] **conducted by ECB Banking Supervision and the 2021 ECB**

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[1]   For further details, see the press release "ECB presents action plan to include climate change considerations in its monetary policy strategy", ECB, 8 July 2021. The climate risk stress test was conducted by the ECB's Directorate Risk Management in cooperation with the Eurosystem's Risk Management Committee.

[2]   For further details, see "NGFS Climate Scenarios for central banks and supervisors", Network for Greening the Financial System, June 2021.

[3]   For further details, see "2022 climate risk stress test", ECB Banking Supervision, July 2022.

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economy-wide climate stress test[4]**.** Under all five scenarios, the exercise applied credit risk shocks using satellite models specific to each type of financial exposure. These shocks are based on the aforementioned 2022 climate risk stress test by ECB Banking Supervision as well as on NGFS data. In addition to credit shocks, the exercise used market shocks in the form of increases in risk-free interest rates and corporate bond spreads.

This climate risk stress test of the Eurosystem balance sheet used the Eurosystem's financial risk assessment framework as the basis for its risk estimation, using the aforementioned shocks. This framework, which is also used for the Eurosystem's regular financial risk assessment and reporting tasks, is based on a joint market and credit risk simulation model. The analysed results take the form of an expected shortfall[5] estimated at a 99% confidence level over a one-year horizon. Two different perspectives were considered: a standalone risk approach, which calculates the risk of each portfolio independently; and a risk contribution approach, which determines the contribution of each portfolio to the total risk for the Eurosystem. The cut-off date for the Eurosystem balance sheet and market data was 30 June 2022.

Table A

Overview of the scenarios and main results of the 2022 climate risk stress test of the Eurosystem balance sheet

Scenario	Projections	Horizon	Risk type	Results
Long-term scenarios	Orderly transition / Disorderly transition / Hot house world	30 years (2020-50)	Both transition and physical risk	Transition and physical risk have a material impact. Corporate bonds are the main risk contributor. The impact of transition risk on corporate bonds is concentrated in specific sectors, while physical risk impact is concentrated in certain geographical areas. Covered bonds, ABSs and credit operations contribute less to total risk.
Short-term disorderly scenario	Baseline / Stress	Three years (2022-24)	Transition risk	Transition risk has a material impact. Corporate bonds are the main risk contributor. The risk for corporate bonds is concentrated in specific sectors.
Flood risk scenario	Baseline / Stress	One year (2022)	Physical risk	Physical risk has a material impact. Corporate bonds are the main risk contributor. The risk for corporate bonds is concentrated in certain geographical areas. Covered bonds are significant risk contributors.

The results of the exercise show that both types of climate risk – transition risk and physical risk – have a material impact on the risk profile of the Eurosystem balance sheet. The disorderly transition and hot house world long-term stress scenarios produce risk estimates that are between 20% and 30% higher than those under the orderly transition scenario. The hot house world scenario generates a higher risk impact, showing that physical risk has a greater impact on

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[4] The approach is described in Alogoskoufis, S. et al., "ECB economy-wide climate stress test", *Occasional Paper Series*, No 281, ECB, Frankfurt am Main, September 2021.

[5] This expected shortfall is a tail measure of the distribution of the losses on the Eurosystem balance sheet, which are computed based on relative price differences between the snapshot date and one year later: the shortfall is computed as the average of the worst 1% of losses in the distribution.

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the Eurosystem balance sheet than transition risk. Integrating climate change risk into the Eurosystem's regular risk assessment and provisioning frameworks should make it possible to modify risk control frameworks and build up financial buffers over time, thereby addressing such risks.

The aggregate result is driven mainly by outright holdings of corporate bonds, which under all scenarios make a larger contribution to the total risk increase than the other types of financial exposures included within the scope of this exercise. The impact of climate risk on corporate bonds is particularly concentrated in areas that are specific to each risk type. The impact of transition risk, for example, is primarily concentrated in a limited number of sectors that are particularly vulnerable to climate risk (and which have, on average, a high level of emissions as a percentage of revenue), whereas the impact of physical risk is concentrated in certain geographical areas.

The Eurosystem's corporate bond holdings entail a similar degree of climate risk as the outstanding market volume of securities eligible for such purchases. This can be seen by performing the same stress test on a benchmark sample of securities that meet the Eurosystem's eligibility criteria and are weighted by market capitalisation. Under the two adverse scenarios, the resulting risk increases do not significantly differ from the results obtained for the Eurosystem balance sheet. This outcome was expected owing to the fact that, at the cut-off date, the Eurosystem's corporate bond purchases were determined by a market capitalisation benchmark, as climate change considerations were only incorporated into those types of purchases as of October 2022.

The relative risk increase for both covered bonds and ABSs is greater under the hot house world scenario than under the disorderly transition scenario. The relatively high sensitivity of these assets to physical risk is also reflected in the outcome of the flood risk scenario. Under this scenario, the increase in risk estimates for covered bonds and ABSs is much higher than that for corporate bonds, and it is also higher than under the long-term scenarios. As a result, the contribution of covered bonds to the total risk increase under this scenario is particularly significant. This is not the case for ABSs, however, as the portfolio is considerably smaller. Also, the result for the flood risk scenario highlights the importance of the house price channel in the transmission of climate risk, as covered bonds and ABSs secured by real estate are particularly exposed to fluctuations in housing market valuations.

Collateralised credit operations, meanwhile, make only a small contribution to the total risk increase despite the large size of the exposure. This exercise considered credit operations collateralised by corporate bonds, covered bonds, ABSs and uncovered bank bonds. The lower risk per unit of exposure of these lending operations can be linked to their double default nature: although climate risk stress is channelled through both the counterparty and the collateral, the risk only materialises under scenarios whereby the counterparty defaults and the value of the collateral falls below the level of protection offered by applicable valuation haircuts. This typically occurs in instances when the collateral issuer also defaults. Climate risk is therefore concentrated in exposures to specific counterparties, especially

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under the hot house world scenario, in which certain institutions and the collateral they have posted are both located in regions that are severely affected.

Climate risk stress tests of the Eurosystem balance sheet are expected to be carried out on a regular basis in future. These future exercises should provide an opportunity to further enhance the methodology and expand the scope of the financial exposures covered. Looking ahead, climate risk considerations should also become an integral part of the existing risk management framework, which involves an analysis of the total financial risk for the Eurosystem against the existing financial buffers.

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7 Backcasting real rates and inflation expectations – combining market-based measures with historical data for related variables

Prepared by Valentin Burban and Fabian Schupp

Markets for financial products linked to inflation in the euro area offer valuable insights into market participants' expectations for inflation and real interest rates, but these financial instruments have only been available since the early 2000s. The yields on inflation-linked bonds (ILBs) and the interest rates on inflation-linked swaps (ILSs) incorporate market participants' expectations for inflation and real interest rates over periods from one to 30 years. From a central bank's perspective, the information extracted from these instruments can help to assess the effectiveness of its monetary policy decisions and guide the future course of monetary policy. In the euro area, however, the history of these data spans a very limited number of policy and business cycles, as markets for euro area inflation-linked products emerged only in the early 2000s. This limits the analysis of structural economic relationships.[1]

However, the correlation between market-based measures on one side and various economic variables on the other makes it possible to estimate time series for ILS rates and market-implied real rates stretching further back in time, or "backcast" them. These longer time series are constructed by estimating the relationship between ILS rates or market-implied real rates and longer time series of statistical data for variables such as inflation or indicators of economic activity. The starting point for the backcasting exercise is a set of 108 variables, dating back to at least 1992, that may provide information about inflation compensation and real rates.[2] On the basis of a statistical model[3] and economic judgement, the time series deemed most useful for generating the historical proxies are selected from the pool. These include year-on-year inflation in the euro area, growth in industrial production, observed short-term real rates (nominal short-term rates minus realised inflation), a measure of the output gap, survey information on inflation and real rate expectations, several bond yields and indicators of economic policy uncertainty. By assuming (and testing) that the statistical relationship between these times series and ILS rates or market-implied real rates is stable over time, the latter can be backcasted, i.e. an estimate of their values produced for periods before

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[1] The analysis in the box is based on euro area ILS rates. While the market for these instruments has existed since the early 2000s, the analysis builds on a sample starting in 2005 only, a time by which the market is considered to have been fully developed. See e.g. Neri, S., Bulligan, G., Cecchetti, S., Corsello, F., Papetti, A., Riggi, M., Rondinelli, C. and Tagliabracci, A., "On the anchoring of inflation expectations in the euro area", *Questioni di Economia e Finanza, No 712, Banca d'Italia*, September 2022.

[2] In the case of financial variables, rather than using aggregates based on data for all euro area countries before 1999, the set of variables builds mainly on series for Germany and France.

[3] For a given variable (ILS or real rate for a specific maturity) the selection is based partly on a sequential application of a least absolute shrinkage and selection operator (LASSO) regression.

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they were available.[4] Results from this exercise are shown in Chart A. The backcasted series indicate the broad contours of inflation compensation and real rates for various maturities over a period where real-time market-based measures were not yet available. This could shed light, for example, on whether trends observed when market-based indicators were available were already in place in the past. More generally, the long estimated time series for inflation compensation and real rates can be used as input into econometric analysis and for illustrating stylised facts and historical patterns. At the same time, the "quasi-historical" time series should be interpreted with care, and small fluctuations over short time periods should not be overinterpreted.

Chart A
Backcasted euro area inflation-linked swap rates and market-implied real rates

(percentages per annum)

- One-year
- Two-year
- Five-year
- Ten-year
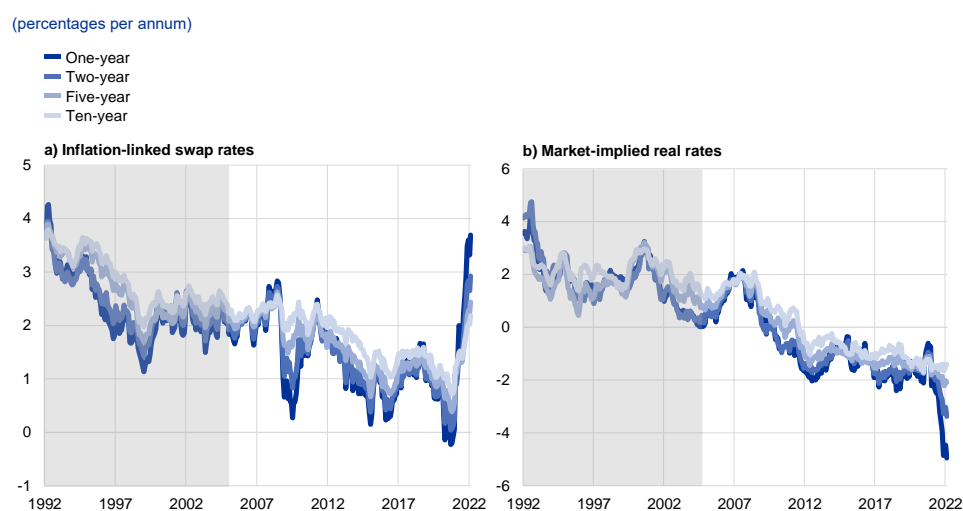
Sources: Refinitiv, Bloomberg, OECD, Consensus Economics, Eurostat, Baker, Bloom and Davis[5], and ECB calculations.
Notes: The data series show fitted values. The shaded areas mark the period for which euro area ILS rates and real rates have been backcasted (January 1992 to March 2005). The latest observations are for February 2022.

The ILS and real rate series implied by models fit observed time series reasonably well (Charts B and C). Moreover, for shorter swap maturities, backcasted ILS rates are broadly in line with survey-based measures of inflation expectations obtained from Consensus Economics as well as from the OECD Economic Outlook, i.e. backcasted dynamics appear plausible against these yardsticks (Chart B).[6] At longer maturities the backcasted series deviate considerably from survey-based measures of inflation expectations (Chart C). This is not per se an indication of a misfit, however, and is in line with results in the literature suggesting that long-term market-based measures of inflation expectations include a

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[4]   This approach follows the analyses conducted in Groen, J. and Middeldorp, M., "Creating a History of U.S. Inflation Expectations", *Liberty Street Economics, Federal Reserve Bank of New York, 21 August 2013 and Marshall, W., "*Introducing a backcast history of traded inflation*", Global Rates Notes, Goldman Sachs, 2020*.

[5]   Baker, S.R., Bloom, N. and Davis, S.J., "Measuring Economic Policy Uncertainty", *The Quarterly Journal of Economics*, Vol. 131, No 4, November 2016, pp. 1593-1636.

[6]   In part, this is of course by construction, since these surveys are also contained in the set of explanatory variables.

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sizeable risk premium.[7] Survey information is, by contrast, generally considered to exclude risk premia.[8] The results for backcasted market-implied real rates fit observed series equally well. Here too, shorter maturities are broadly in line with measures of inflation expectations obtained from survey data in combination with nominal yield data.

Chart B

Fit of two-year euro area inflation-linked swap and market-implied real rates with survey-based inflation expectations

a) Inflation compensation

(percentages per annum)
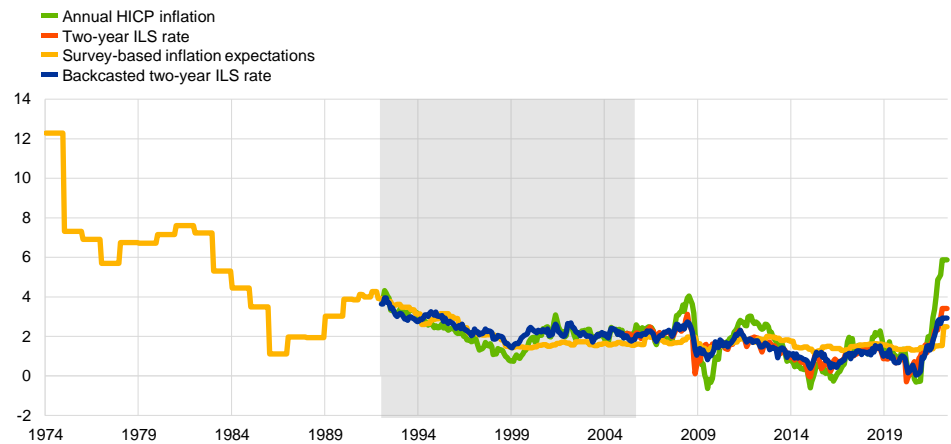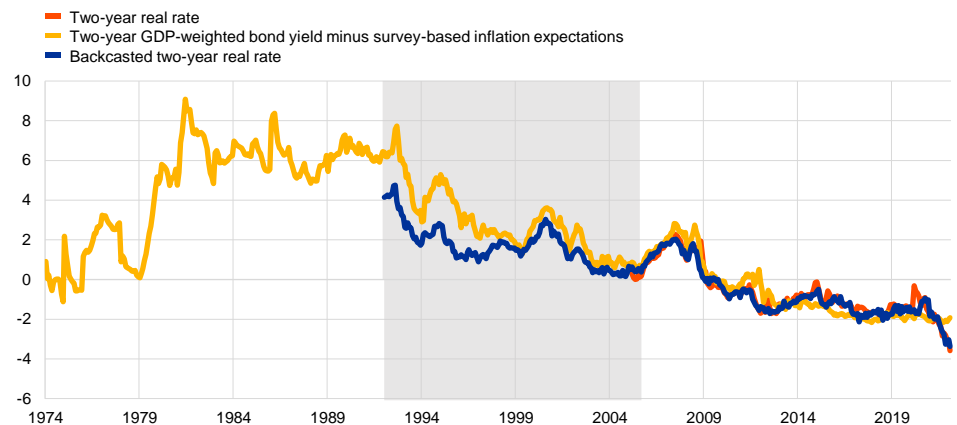
- Annual HICP inflation
- Two-year ILS rate
- Survey-based inflation expectations
- Backcasted two-year ILS rate

b) Real rates

(percentages per annum)

- Two-year real rate
- Two-year GDP-weighted bond yield minus survey-based inflation expectations
- Backcasted two-year real rate

Sources: Refinitiv, Bloomberg, OECD, Consensus Economics, Eurostat, Baker, Bloom and Davis, and ECB calculations.
Notes: The shaded areas mark the sample for which euro area ILS rates and real rates have been backcasted (January 1992 to March 2005). Survey-based inflation expectations are from the OECD Economic outlook and Consensus Economics. The latest observations are for February 2022.

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[7] See the box entitled "Decomposing market-based measures of inflation compensation into inflation expectations and risk premia", *Economic Bulletin, Issue 8*, ECB, 2021.

[8] Moreover, inflation expectations gauged from surveys may in any case differ from those embedded in financial market prices.

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Chart C

Fit of euro area five-year forward inflation-linked swap rate five years ahead with survey-based inflation expectations

(percentages per annum)
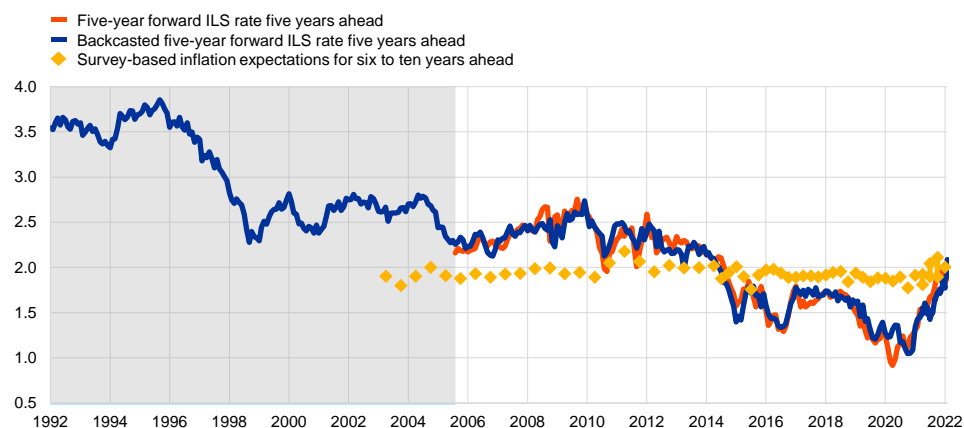
- Five-year forward ILS rate five years ahead
- Backcasted five-year forward ILS rate five years ahead
- Survey-based inflation expectations for six to ten years ahead

Sources: Refinitiv, Bloomberg, OECD, Consensus Economics, Eurostat, Baker, Bloom and Davis, and ECB calculations.
Notes: The shaded area marks the sample for which euro area ILS rates and real rates have been backcasted (January 1992 to March 2005). Survey-based inflation expectations are from Consensus Economics. The latest observations are for February 2022.

Backcasted series suggest that the observed trend decline in long-term nominal risk-free rates in the run-up to the introduction of the euro in 1999 reflected both lower inflation compensation and lower market-implied real rates, which later explain most of the decline in nominal rates since 1999 (Chart D). The decline in the backcasted ILS rates in the 1990s is in line with the decrease in headline inflation across countries that would later be part of the euro area. However, lower and at the same time more stable inflation was also a global phenomenon observed in the context of the Great Moderation that is often linked to more effective monetary policy.[9] These developments were accompanied by a broad decline in nominal interest rates in the future euro area in the run-up to the creation of the euro, which according to the backcasted series of ILS and market-implied real rates reflected lower inflation compensation and lower real rates in equal parts. During the early years after the inception of the euro, both the backcasted ILS rates and backcasted market-implied real rates remain fairly stable, but subsequently decline significantly further: first in 2008 in the context of the global financial crisis and then during the low inflation period between 2013 and the pandemic crisis in 2020-21. However, while ILS rates have now recovered from their declines and returned to levels closer to 2%, implied real rates remain at historically low levels, in line with a more permanent decline in the natural rate of interest.[10]

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[9] See Bernanke, B.S., "The Great Moderation", in Koenig, E.F., Leeson, R. and Kahn, G.A. (eds.), *The Taylor Rule and the Transformation of Monetary Policy, Chapter 6, Hoover Institution Press, Stanford, California, June 2012.*

[10] For estimates and a discussion of the drivers of the natural rate of interest, see Brand, C., Bielecki, M. and Penalver, C., "The natural rate of interest: estimates, drivers, and challenges to monetary policy", *Occasional Paper Series*, No 217, ECB, December 2018.

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Chart D

Decomposition of the nominal ten-year euro area risk-free yield into an inflation component and real rates

(percentages per annum)
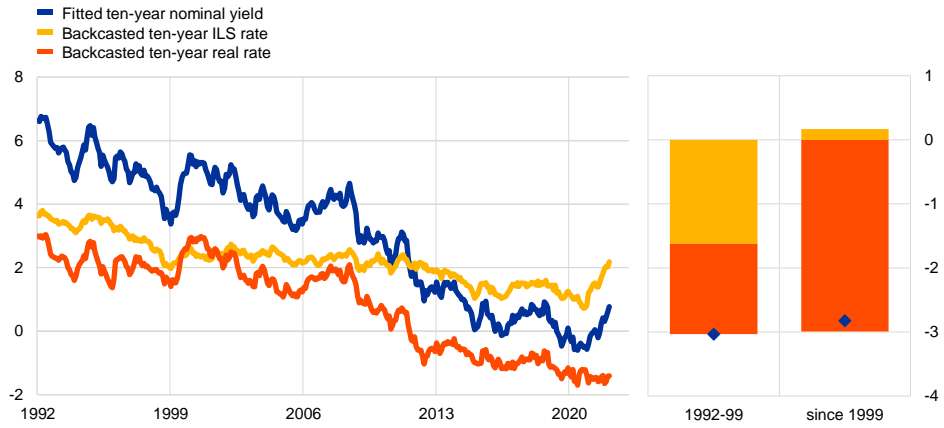
- Fitted ten-year nominal yield
- Backcasted ten-year ILS rate
- Backcasted ten-year real rate

Sources: Refinitiv, Bloomberg, OECD, Consensus Economics, Eurostat, Baker, Bloom and Davis, and ECB calculations.
Notes: The fitted nominal risk-free yield is computed as the sum of the backcasted and fitted series of the ten-year ILS rate and the backcasted and fitted series of the ten-year market-implied real rate. Ten-year ILS rates and ten-year real rates have been backcasted for the sample January 1992 to March 2005. The change bars in the right-hand panel depict the decomposition of the change in the fitted nominal ten-year yield into an inflation and real rate component for the respective time span. The latest observations are for February 2022.

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8 Liquidity conditions and monetary policy operations from 2 November 2022 to 7 February 2023

Prepared by Elvira Fioretto and Ross James Murphy

This box describes liquidity conditions and the ECB's monetary policy operations during the seventh and eighth reserve maintenance periods of 2022. Together, these two maintenance periods ran from 2 November 2022 to 7 February 2023 (the "review period").

Policy tightening continued during the review period. The ECB's Governing Council raised its key policy rates by 75 basis points at the Governing Council meeting at the end of October 2022 and raised them by a further 50 basis points at its mid-December 2022 meeting. These increases took effect in the seventh and eighth maintenance periods respectively.

Average excess liquidity in the euro area banking system declined by €245.8 billion during the review period, but remained very ample at levels above €4 trillion. The decrease was mainly driven by the early repayments in November and December of funds provided under operations 3 to 10 of the third series of targeted longer-term refinancing operations (TLTRO III). However, the decline was partially offset by the reduction in net autonomous factors, which added liquidity to the system. This decline in net autonomous factors continued the trend observed since the end of the negative interest rate environment in July 2022. During the eighth maintenance period a decline in government deposits was the primary driver of the reduction in net autonomous factors.

Hrvatska narodna banka joined the Eurosystem on 1 January 2023 when Croatia adopted the euro. Hrvatska narodna banka has therefore become the 20th Eurosystem member. As of 1 January 2023, the balance sheet figures of Hrvatska narodna banka began to be included in the financial statements of the Eurosystem.

Liquidity needs

The average daily liquidity needs of the banking system, defined as the sum of net autonomous factors and reserve requirements, decreased by €259.6 billion in the review period, to €2,247 billion. The decrease was almost entirely due to a fall of €264 billion in net autonomous factors, to €2,079.7 billion, which, in turn, was mainly driven by a decline in liquidity-absorbing autonomous factors (see the section of Table A entitled "Other liquidity-based information"). The minimum reserve requirements marginally increased by €4.4 billion to stand at €167.3 billion.

Liquidity-absorbing autonomous factors decreased by €211.5 billion in the review period, to €3,068.5 billion, mainly owing to a declining trend in government deposits and other autonomous factors. Government deposits fell by €112.7 billion on average over the review period, to €432.6 billion, with most of

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the decline taking place in the eighth maintenance period (see the section of Table A entitled "Liabilities"). With the removal of the 0% interest rate ceiling on government deposits, as decided by the Governing Council in September 2022, the decline not only reflects seasonal effects, whereby lower balances are normally held at the end of the year, but it also reflects a more structural post-pandemic decline in the buffers held by national treasuries and an increase in the investment of such buffers in market instruments. The average value of banknotes in circulation decreased by €11.3 billion over the review period, to €1,563.2 billion. The reduction in banknote holdings and the amount of vault cash observed since the end of the negative policy rate environment continued, but at a slower pace. This trend was partially offset by the usual seasonal increase observed at the end of the year.

Liquidity-providing autonomous factors increased by €52.6 billion to stand at €989.2 billion. While net foreign assets decreased marginally, declining by €2.5 billion, net assets denominated in euro increased by €55.1 billion in the review period.

Table A provides an overview of the autonomous factors[1] discussed above and their changes.

Table A
Eurosystem liquidity conditions

Liabilities

(averages; EUR billions)

	Current review period: 2 November 2022-7 February 2023			Previous review period: 27 July-1 November 2022
	Seventh and eighth maintenance periods	**Seventh maintenance period: 2 November-20 December 2022**	**Eighth maintenance period: 21 December 2022-7 February 2023**	**Fifth and sixth maintenance periods**
Liquidity-absorbing autonomous factors	3,068.5 (-211.5)	3,155.4 (-74.9)	2,981.6 (-173.9)	3,280.0 (-105.3)
Banknotes in circulation	1,563.2 (-11.3)	1,560.8 (-2.9)	1,565.6 (+4.7)	1,574.5 (-22.3)
Government deposits	432.6 (-112.7)	492.5 (-44.2)	372.8 (-119.7)	545.3 (-97.4)
Other autonomous factors (net)[1]	1,072.7 (-87.5)	1,102.1 (-27.7)	1,043.2 (-58.9)	1,160.2 (+14.5)
Current accounts above minimum reserve requirements	**37.4 (-1,933.8)**	**47.1 (-120.5)**	**27.7 (-19.5)**	**1,971.2 (-1,871.8)**
Minimum reserve requirements[2, 3]	167.3 (+4.4)	166.7 (+2.3)	167.9 (+1.3)	162.9 (+3.8)
Deposit facility	4,286.5 (+1,688.0)	4,521.5 (+31.5)	4,051.6 (-470.0)	2,598.5 (+1,918.3)
Liquidity-absorbing fine-tuning operations	0.0 (+0.0)	0.0 (+0.0)	0.0 (+0.0)	0.0 (+0.0)

Source: ECB.
Notes: All figures in the table are rounded to the nearest €0.1 billion. Figures in brackets denote the change from the previous review or maintenance period.
1) Computed as the sum of the revaluation accounts, other claims and liabilities of euro area residents, capital and reserves.
2) Memo item that does not appear on the Eurosystem balance sheet and should therefore not be included in the calculation of total liabilities.
3) With the suspension of the two-tier system, information on the exemption allowance has been removed from the table.

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[1] For further details on autonomous factors, see the article entitled "The liquidity management of the ECB", *Monthly Bulletin*, ECB, May 2002.

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Assets

(averages; EUR billions)

	Current review period: 2 November 2022-7 February 2023						Previous review period: 27 July- 1 November 2022	
	Seventh and eighth maintenance periods		Seventh maintenance period: 2 November- 20 December 2022		Eighth maintenance period: 21 December 2022- 7 February 2023		Fifth and sixth maintenance periods	
Liquidity-providing autonomous factors	**989.2**	**(+52.6)**	**996.0**	**(+14.5)**	**982.4**	**(-13.6)**	**936.6**	**(-5.4)**
Net foreign assets	950.4	(-2.5)	960.4	(+4.6)	940.4	(-20.0)	952.9	(+14.6)
Net assets denominated in euro	38.8	(+55.1)	35.6	(+9.8)	42.0	(+6.3)	-16.3	(-20.0)
Monetary policy instruments	**6,570.9**	**(-505.4)**	**6,895.1**	**(-175.9)**	**6,246.7**	**(-648.4)**	**7,076.3**	**(-49.6)**
Open market operations	6,570.9	(-505.4)	6,895.1	(-175.9)	6,246.6	(-648.5)	7,076.3	(-49.6)
Credit operations	1,626.8	(-497.9)	1,949.0	(-173.7)	1,304.5	(-644.5)	2,124.7	(-53.7)
MROs	1.6	(-1.2)	1.9	(-2.0)	1.2	(-0.7)	2.8	(+2.1)
Three-month LTROs	2.4	(+1.2)	2.0	(+0.4)	2.8	(+0.8)	1.2	(+0.9)
TLTRO III operations	1,621.9	(-496.8)	1,944.0	(-171.7)	1,299.7	(-644.3)	2,118.7	(-55.9)
PELTROs	0.9	(-1.0)	1.1	(-0.4)	0.8	(-0.3)	2.0	(-0.8)
Outright portfolios	4,944.1	(-7.5)	4,946.1	(-2.2)	4,942.1	(-3.9)	4,951.6	(+4.0)
Marginal lending facility	0.0	(+0.0)	0.0	(-0.0)	0.1	(+0.1)	0.0	(+0.0)

Source: ECB.
Notes: All figures in the table are rounded to the nearest €0.1 billion. Figures in brackets denote the change from the previous review or maintenance period. "MROs" denotes main refinancing operations, "LTROs" denotes longer-term refinancing operations, and "PELTROs" denotes pandemic emergency longer-term refinancing operations.
1) With the discontinuation of net asset purchases, the individual breakdown of outright portfolios is no longer shown.

Other liquidity-based information

(averages; EUR billions)

	Current review period: 2 November 2022-7 February 2023						Previous review period: 27 July- 1 November 2022	
	Seventh and eighth maintenance periods		Seventh maintenance period: 2 November- 20 December 2022		Eighth maintenance period: 21 December 2022- 7 February 2023		Fifth and sixth maintenance periods	
Aggregate liquidity needs[1]	2,247.0	(-259.6)	2,326.4	(-86.9)	2,167.5	(-158.9)	2,506.6	(-96.2)
Net autonomous factors[2]	2,079.7	(-264.0)	2,159.8	(-89.2)	1,999.6	(-160.2)	2,343.7	(-100.0)
Excess liquidity[3]	4,323.9	(-245.8)	4,568.6	(-89.0)	4,079.1	(-489.5)	4,569.7	(+46.5)

Source: ECB.
Notes: All figures in the table are rounded to the nearest €0.1 billion. Figures in brackets denote the change from the previous review or maintenance period.
1) Computed as the sum of net autonomous factors and minimum reserve requirements.
2) Computed as the difference between autonomous liquidity factors on the liabilities side and autonomous liquidity factors on the assets side. For the purposes of this table, items in the course of settlement are also added to net autonomous factors.
3) Computed as the sum of current accounts above minimum reserve requirements and the recourse to the deposit facility minus the recourse to the marginal lending facility.

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Interest rate developments

(averages; percentages and percentage points)

	Current review period: 2 November 2022-7 February 2023			Previous review period: 27 July-1 November 2022
	Seventh and eighth maintenance periods	**Seventh maintenance period: 2 November-20 December 2022**	**Eighth maintenance period: 21 December 2022-7 February 2023**	**Fifth and sixth maintenance periods**
MROs	2.25 (+1.38)	2.00 (+0.75)	2.50 (+0.50)	0.88 (+0.88)
Marginal lending facility	2.50 (+1.38)	2.25 (+0.75)	2.75 (+0.50)	1.13 (+0.88)
Deposit facility	1.75 (+1.38)	1.50 (+0.75)	2.00 (+0.50)	0.38 (+0.88)
€STR	1.652 (+1.366)	1.402 (+0.745)	1.902 (+0.501)	0.286 (+0.869)
RepoFunds Rate Euro Index	1.485 (+1.337)	1.313 (+0.854)	1.658 (+0.345)	0.148 (+0.794)

Source: ECB.
Notes: Figures in brackets denote the change in percentage points from the previous review or maintenance period. The €STR is the euro short-term rate.

Liquidity provided through monetary policy instruments

The average amount of liquidity provided through monetary policy instruments decreased by €505.4 billion during the review period, to €6,570.9 billion (Chart A). The reduction in liquidity was primarily driven by the decline in credit operations as a result of voluntary repayments by banks of TLTRO III funds. Net asset purchases under the ECB's pandemic emergency purchase programme (PEPP) were discontinued at the end of March 2022 and purchases under its asset purchase programme (APP) were discontinued on 1 July 2022, meaning that outright portfolios no longer provide any additional liquidity.[2] As communicated in December, the APP portfolio will decline at a measured and predictable pace from the beginning of March 2023, as the Eurosystem will no longer 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 and its subsequent pace will be determined over time.

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[2] Securities held in the outright portfolios are carried at amortised cost and revalued at the end of each quarter, which also has an impact on the total averages and the changes in the portfolios.

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Chart A

Changes in liquidity provided through open market operations and excess liquidity

(EUR billions)

- Credit operations
- Outright portfolios
- Excess liquidity
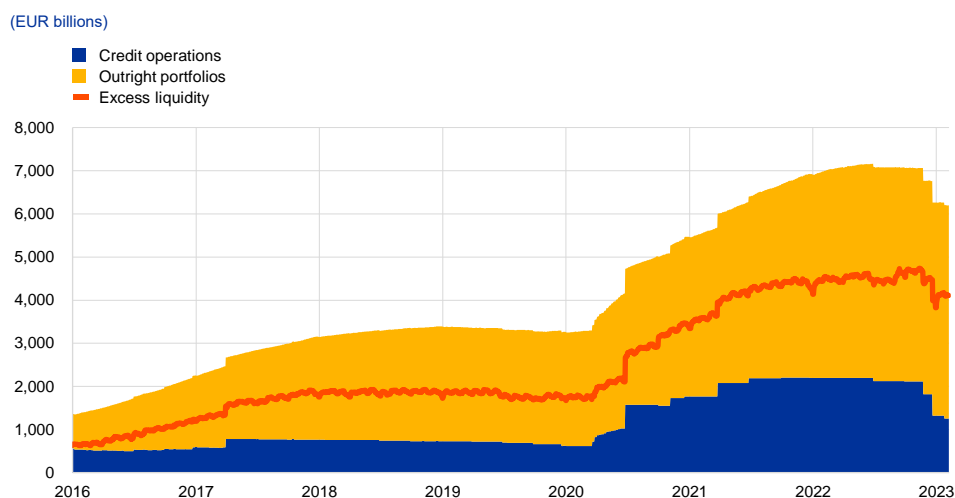
Source: ECB.
Note: The latest observations are for 7 February 2023.

The average amount of liquidity provided through credit operations decreased by €497.9 billion during the review period. This decrease mainly reflects the voluntary TLTRO III repayments, which amounted to €496.8 billion during the review period. The voluntary early repayment operations in November, December and January amounted to €296.3 billion, €447.5 billion and €62.7 billion respectively. These large repayments followed the decision of the ECB's Governing Council to recalibrate the terms of the operations at the end of October in order to ensure consistency with the broader monetary policy normalisation process. Changes in other credit operations (pandemic emergency longer-term refinancing operations, main refinancing operations and three-month longer-term refinancing operations) were minor, amounting to a net decline in liquidity provided of just €1 billion.

Excess liquidity

Average excess liquidity decreased by €245.8 billion to reach €4,323.9 billion (Chart A). Excess liquidity is the sum of banks' reserves above the reserve requirements and the recourse to the deposit facility net of the recourse to the marginal lending facility. It reflects the difference between the total liquidity provided to the banking system and banks' liquidity needs. After peaking in September 2022 (at €4.8 trillion), excess liquidity has progressively decreased following the aforementioned TLTRO III early repayments, net of the effects of autonomous factors.

Interest rate developments

The average euro short-term rate (€STR) increased by 136.6 basis points over the review period, to 1.65% per annum. The pass-through of the ECB policy rate

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hikes that became applicable in November and December to unsecured money market rates was complete and immediate. On average, the €STR traded at 9.8 and 10 basis points below the deposit facility rate during the seventh and eighth maintenance periods respectively, compared with 8.5 and 9.3 basis points during the fifth and sixth maintenance periods respectively.

The average euro area repo rate, as measured by the RepoFunds Rate Euro Index, increased by almost 133.7 basis points during the review period, to 1.485%. The pass-through to secured money market rates was not as smooth as for the unsecured money market, particularly in the case of the initial policy rate hikes in July and September 2022. However, transmission subsequently improved, with the policy rate hikes in November and December being almost fully passed through. This smoother transmission was likely related to an easing of concerns about collateral scarcity. Collateral availability improved through several channels. At its September meeting, the ECB's Governing Council decided to change the remuneration of certain non-monetary policy deposits by temporarily removing the 0% interest rate ceiling for the remuneration of government deposits until 30 April 2023, thereby reducing market concerns that a large portion of government deposits held with the Eurosystem would be placed in the repo market. The debt management offices of Germany and Italy announced further measures to facilitate the functioning of the repo market. As of 10 November the Eurosystem increased the securities lending limit against cash to €250 billion (from €150 billion), in order to pre-empt potential concerns around the year-end and support market functioning in general. Furthermore, the TLTRO III early repayment operations have also helped increase the availability of collateral eligible for use in repo operations by releasing some marketable collateral with which TLTRO borrowing had been collateralised.

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9 Update on euro area fiscal policy responses to the energy crisis and high inflation[1]

Prepared by Cristina Checherita-Westphal and Ettore Dorrucci

This box provides updated estimates on the fiscal support provided by euro area governments in response to the energy crisis and high inflation, reflecting the March 2023 ECB staff macroeconomic projections.[2] It updates the budget balance cost of the discretionary energy and inflation compensatory measures to reflect the latest developments in energy prices and changes in fiscal policy since the December 2022 Eurosystem staff macroeconomic projections. It also provides more granular information on the design and timing of these fiscal policy support measures. This includes an assessment of the energy price caps and the quarterly profile of the measures, which help to give a more accurate indication of the transmission of such measures to inflation.[3]

According to the March 2023 ECB staff macroeconomic projections, the discretionary fiscal support enacted by euro area governments in response to the energy crisis and high inflation remains sizeable in 2023 (Chart A). This fiscal support is estimated to amount to around 1.8% of euro area GDP in 2023 (down from 1.9% in 2022) and to drop steeply to 0.5% of GDP in 2024. Prior to Russia's invasion of Ukraine, euro area energy support was relatively limited and confined to a few countries. However, following the surge in energy prices in 2022, energy support measures were adopted by all euro area countries, although the size of the measures differed considerably across member states. Such measures mainly took the form of reduced indirect taxes and increases in subsidies, mostly in relation to energy products, as well as transfers to households. In autumn 2022, when governments drafted their budget plans for 2023 – which were underpinned in some countries by multi-annual government strategies – the measures were further expanded into the last quarter of 2022 and into 2023, with some support measures having effects over the period 2024-25. Moreover, significant price cap measures were approved in some countries, in particular in Germany (with deficit effects primarily in 2023) and the Netherlands (effects limited to 2023). In other countries, such measures were extended, for example in France (to 2023, with some effects also estimated in 2024) and, to a lesser extent, in Spain (to 2023).

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[1] This box updates the estimates provided in the article entitled "Fiscal policy and high inflation", which is included in this issue of the *Economic Bulletin* but was pre-released on 13 February 2023. It refers to government measures with an impact on the budget balance. In addition, some governments have enacted regulatory measures limiting the increase in energy prices that may not have a direct budget balance impact and/or other forms of liquidity support, such as guarantees. The latter would, in principle, affect their budget balances only if the guarantees (contingent liabilities) are activated.

[2] The fiscal policy assumptions and projections in the context of the March 2023 ECB staff macroeconomic projections were finalised in early March 2023.

[3] For an updated quantification of the impact of these measures on inflation over the period 2023-25, see the ECB staff macroeconomic projections published on 16 March 2023.

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Chart A

Euro area discretionary fiscal policy support measures in response to the energy crisis and high inflation

a) Size of support and composition by fiscal instrument over the projection horizon

(percentages of GDP)

- ● Total support
- ■ Government consumption
- ■ Subsidies
- ■ Capital transfers to firms
- ■ Other transfers
- ■ Indirect taxes
- ■ Direct taxes and social contributions
- ▬ Net support
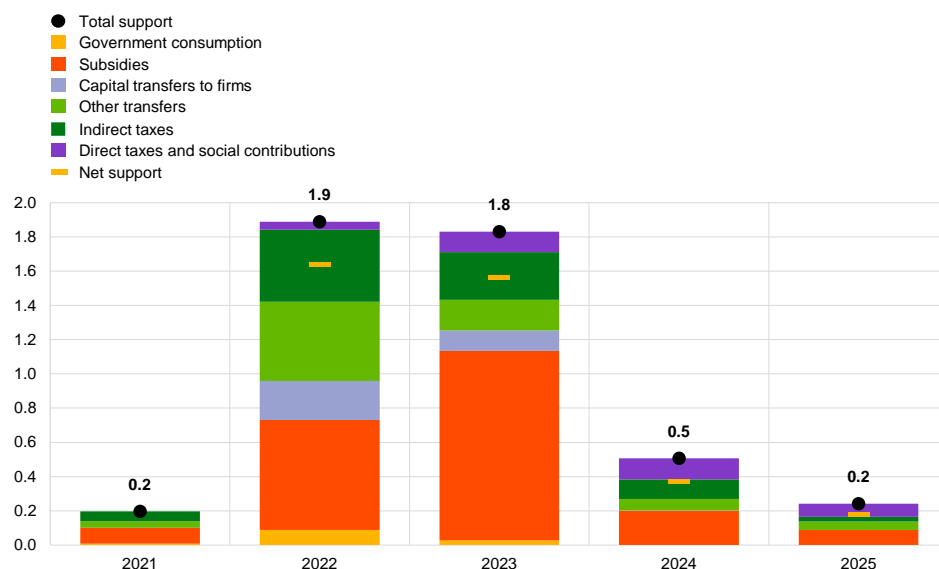
b) Decomposition of measures based on the channels through which they affect inflation

(percentages of GDP)
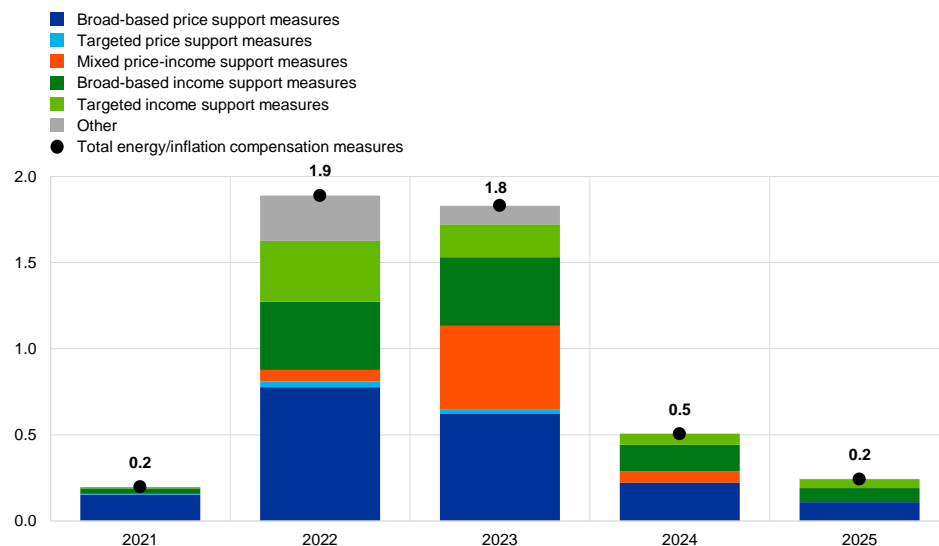
- ■ Broad-based price support measures
- ■ Targeted price support measures
- ■ Mixed price-income support measures
- ■ Broad-based income support measures
- ■ Targeted income support measures
- ■ Other
- ● Total energy/inflation compensation measures

Sources: ECB staff calculations based on the March 2023 ECB staff macroeconomic projections and updates to the fiscal questionnaires provided by the ESCB Working Group on Public Finance (WGPF).
Notes: In Panel a), the size of the bars denotes the fiscal support with impact on the budget balance in gross terms. "Net support" refers to the gross budget support adjusted for discretionary financing measures (mostly taxes on energy sector windfall profits). "Other transfers" mostly refers to transfers to households. In Panel b), the distinctions between income support and price support measures, as well as between targeted measures and broad-based measures are explained in the article entitled "Fiscal policy and high inflation" in this issue of the Economic Bulletin. The category "Mixed price-income support measures" refers to fiscal policy support measures that cannot be clearly distinguished as either income or price support. This relates mostly to the German energy price brakes, which are of a mixed nature in that the measures are recorded in principle as income support, but also have effects on HICP. The category "Other" includes government purchases to fill gas storage, capital transfers to support liquidity of firms and any other residual items.

Compared with the December 2022 Eurosystem staff projections, the euro area total gross fiscal support in response to the energy crisis and high inflation

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has been scaled down for 2023, albeit only by 0.14 percentage points when looking at the year as a whole. The reason for the observed stickiness in the budgeted fiscal cost of energy measures is that only about 43% of such fiscal support in 2023 is linked directly to energy prices via energy price caps. The remainder represents standard measures such as subsidies, indirect tax cuts and transfers to households, which do not usually have an explicit link to market energy prices. This means that such measures are either rolled back on the basis of a discretionary decision or remain in place. Moreover, it would be difficult to reassess their actual budget impact in real time. The extent of the pass-through from wholesale energy prices to the fiscal cost of price cap measures differs from country to country. It depends on three main factors: (i) the *lag* with which wholesale prices affect consumer (retail) energy prices (the longer the lag, the later the fiscal costs react); (ii) the specific *design* of measures (for example, based on past versus current energy consumption); and (iii) the prevailing *structure of energy contracts* in each country (at fixed versus flexible price). Among the five largest euro area economies, the pass-through from wholesale prices to fiscal costs is estimated within the same year to be high in the Netherlands and low in Germany and France, while price cap measures with a direct budget balance effect are relatively limited in Spain and are not in place in Italy, at least for the time being. Finally, the stickiness in the cost of fiscal support for 2023 at euro area aggregate level can also be explained by the fact that the estimates for some countries have been revised upwards since the December 2022 projections in the light of new information included in the final budget laws, including extensions of support measures into 2023.[4]

As illustrated in Chart A, panel b), these energy/inflation compensation measures affect inflation via two main channels:

1. **Direct price effects.** Temporary fiscal measures with a direct impact on the marginal cost of energy consumption reduce short-term inflationary pressures. Such measures may also favour wage moderation and thus limit the second-round effects of energy price hikes. Measures in this group fall into two main categories:

   (a) indirect tax cuts and equivalent measures, such as reductions in energy network fees. These measures lower prices upon enactment and have reverse effects when withdrawn, generating a cliff-effect inflation profile that may be relatively independent of contemporaneous energy price developments;

   (b) gas and electricity retail price caps. While such measures also have a direct effect on inflation, their impact on the inflation profile is normally smoother than for indirect tax measures.

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[4] Moving from gross to net support (i.e. gross support minus discretionary financing measures), the euro area energy measures for 2023 remain broadly unchanged since the December 2022 projections, at 1.6% of GDP. For some discretionary financing measures, such as exceptional taxes on energy companies' profits and lower subsidies to green energy-producing companies, the yield of the measures depends more directly on the dynamics of gas prices and has therefore been revised downwards more substantially, in particular in France.

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2. **Indirect disposable income effects via aggregate demand.** In this case, some cumulated upside effects on inflation could be expected. However, these effects will be relatively less pronounced and more lagged, as they operate via the disposable income channel that affects private consumption only partially and with some delay. At the same time, these effects may have a more persistent impact.

While the two channels tend to run in opposite directions, in the short term the impact on HICP inflation stems mainly from direct price effects. Chart A, panel b) provides annual estimates of the budget costs for these two main transmission channels, as well as for measures that are mixed in nature – falling into both categories – and those that cannot be easily classified into either category. In addition, it highlights the important distinction between broad-based and targeted measures, which is also relevant both from a distributional angle and in terms of macroeconomic transmission. Overall, targeted support to low-income households and energy-intensive firms remains limited in the euro area, although with significant heterogeneity across countries.[5]

Finally, combined with a more detailed mapping of fiscal instruments, the quarterly profile of fiscal support over the projection horizon also plays an important role, given its macroeconomic implications (Chart B). While in 2022 the size of the measures grew from quarter to quarter, the opposite can be observed thereafter. The quarterly profile points to a significant rolling back of certain measures already in the first quarter of 2023 (by about €30 billion). The cost of the measures is then estimated to roughly halve at the beginning of 2024, and to drop more gradually thereafter. Chart B also shows the fiscal instruments and propagation channels that are relevant for macroeconomic model simulations.

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[5] Estimates range between 10% and 30% depending on the definition of "targeted". Based on the means-tested definition used in the Eurosystem's estimates, targeted measures amount to only 12% in 2023.

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Chart B

Quarterly profile and macroeconomic channel classification of euro area discretionary fiscal policy support measures in response to the energy crisis and high inflation

(EUR billions)
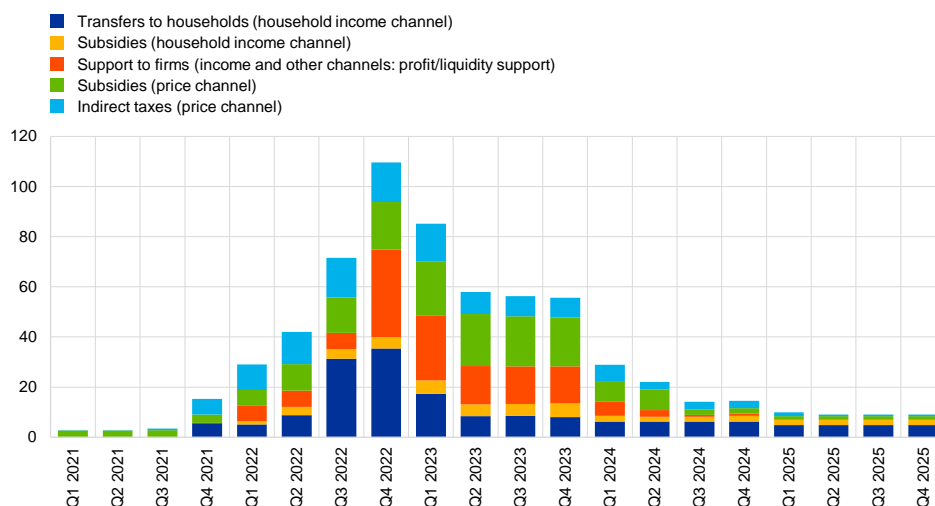
- ■ Transfers to households (household income channel)
- ■ Subsidies (household income channel)
- ■ Support to firms (income and other channels: profit/liquidity support)
- ■ Subsidies (price channel)
- ■ Indirect taxes (price channel)

Sources: ECB staff calculations based on the March 2023 ECB staff macroeconomic projections and updates to the fiscal questionnaires provided by the ESCB's WGPF.
Notes: The classification of energy support measures is based on the WGPF definition of price measures (i.e. affecting the marginal cost of energy consumption), while income measures are classified based on the definition given in the article entitled "Fiscal policy and high inflation" in this issue of the Economic Bulletin. This classification is further adjusted to better account for the channels through which the measures affect inflation (beyond their recording in the government financial statistics, shown in Chart A, panel a). For the purpose of gauging the macroeconomic effects, other forms of support to firms (captured under profit/liquidity support) are simulated as being equivalent to lower direct taxation. For the quarterly profile, the estimates are based on a country-specific and bottom-up approach that accounts for the start and end date of application of individual measures and the announced quarter in which payment of income measures takes place, if known. Where the timeline of measures is not specified, the budget costs are equally distributed across quarters.

The estimates presented in this box are surrounded by a high level of uncertainty. Overall, the balance of risks with respect to the fiscal costs of these support measures, particularly in 2023, is assessed to be tilted towards less stimulus on account of the recent decline in energy prices. At the same time, some upward risks remain related to possible further energy support, particularly during winter 2023/24.

ECB Economic Bulletin, Issue 2 / 2023 – Boxes
Update on euro area fiscal policy responses to the energy crisis and high inflation

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Article

1 Fiscal policy and high inflation

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1 Introduction

The euro area, like other advanced economies, has been facing challenges posed by the rapid and strong increase in inflation. Since mid-2021, inflation in the euro area has increased at a pace last seen in the 1970s and early 1980s, after having been below the ECB's 2% target for almost a decade. Headline year-on-year inflation, as measured by the Harmonised Index of Consumer Prices (HICP), rose from 1.9% in June 2021 to 10.6% in October 2022, before falling to 9.2% in December 2022. The steep increase in inflation has to a large extent been the result of supply-side external shocks and, to a lesser extent, demand-driven internal factors.[1]

The relation between inflation and public finances runs in both directions and depends on several factors. Conventionally, a higher inflation rate is expected to improve public finances, at least in the short term. This is due to the fact that a higher inflation rate raises government revenues, while public expenditure tends to only increase with a lag. However, as this article shows, the fiscal implications of an inflationary shock depend on several factors, most importantly: (i) the nature and size of the inflation shock; (ii) the discretionary fiscal response to the inflation shock; (iii) institutional aspects of government budgets (e.g. price indexation of some public expenditure and characteristics of tax systems); and (iv) the monetary policy reaction. In turn, the fiscal policy reaction affects the inflation outlook itself, according to the size of the impulse and its composition, among other factors.

This article assesses the relation between fiscal policy and inflation, with focus on the euro area and based on the December 2022 Eurosystem staff macroeconomic projections.[2] Following a literature overview in Section 2, Section 3 analyses the impact of inflation on public finances. A distinction is made between the discretionary measures taken by governments to alleviate the burden from high inflation on the economy and other adjustments on both the expenditure and the revenue side of government budgets. The analysis also encompasses the impact of

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[1] ECB, "June 2022 Eurosystem staff macroeconomic projections for the euro area". These projections show that energy remained the main driver of HICP inflation, particularly after Russia's invasion of Ukraine on 24 February 2022 and further supply chain disruptions, with all main subcomponents (fuels, electricity and gas) recording high price dynamics. For an empirical decomposition of HICP inflation excluding energy and food, see the box entitled "The role of demand and supply in underlying inflation – decomposing HICPX inflation into components", *Economic Bulletin*, Issue 7, ECB, 2022.

[2] See ECB, "December 2022 Eurosystem staff macroeconomic projections for the euro area". This article was pre-released on 13 February 2023, drawing on the latest projections at the time.

the current inflation shock on long-term public debt projections. Section 4 presents model simulations gauging the impact of discretionary fiscal policy measures on inflation and growth. A box on the distributional aspects of fiscal policy measures, particularly those on the income side of households, supplements this analysis. Section 5 concludes.

2 Findings from the literature

Inflation affects several components of public finances.[3] These include: (i) primary spending and revenues, and thus the primary budget balance; (ii) market interest rates, which reflect the impact of inflation on the interest paid by the government to bond holders; (iii) the public debt-to-GDP ratio and the real value of debt, the evolution of which also reflects the primary balance and market interest rates.

Conventionally, inflation is considered to have a positive impact on public finances, at least in the short run. Following unanticipated (moderately) higher inflation, government expenditure tends to be rigid in the short run, for instance due to already approved budgets or backward-looking price indexation schemes. On the revenue side, inflation can affect public finances positively if tax bases and collections adjust without significant lags and grow more than nominal GDP. A positive effect of this nature is mainly due to "fiscal drag" in the presence of a progressive tax system.[4] Progressive personal income taxes, as in euro area countries, imply that increases in income in line with inflation raise government *real* tax revenues by pushing nominal incomes into higher tax brackets. This effect occurs when tax brackets are not adjusted to inflation. In line with these considerations, several empirical studies that seek to explain developments in the primary budget balance find a positive, but relatively weak, impact from inflation.[5]

However, when the inflation is generated by an external shock and runs at a high level, its positive impact on public finances can be reversed. The nature of the inflation shock is likely to influence the impact on public finance, as shown in

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[3] For a review of the literature see, among others: Tanzi, V., Blejer, M.I. and Teijeiro, M.O., "Inflation and the Measurement of Fiscal Deficits", Staff Papers, Vol. 34, No 4, International Monetary Fund, December 1987; and Attinasi, M.G. et al., "The effect of low inflation on public finances", in Banca d'Italia, *Beyond the Austerity Dispute: New Priorities for Fiscal Policy*, No 20, March 2016.

[4] For more details, see Morris, R. and Reiss, L., "A decomposition of structural revenue developments for euro area member states", *Working Paper Series*, No 2455, ECB, August 2020.

[5] See the analysis in Attinasi, M.G. et al., op. cit., which finds for samples of euro area and EU countries over the period 1970-2013 that a 1 percentage point increase in the GDP deflator growth is associated with a 0.1 to 0.2 percentage point increase in the primary balance ratio. Similar evidence is found in about half of 13 EU countries investigated – see Berti, K. et al., "Fiscal Reaction Functions for European Union Countries", *European Economy Discussion Papers*, No 028, April 2016.

several empirical and model-based analyses.[6] An external supply-side inflationary shock, for instance higher imported oil or gas prices (akin to the current energy shock in the euro area), can have a more detrimental impact on public finances than a domestic shock. An increase in imported energy prices will gradually feed into consumer prices, thus reducing household real income, moderating consumption spending and overall activity, and eventually reducing tax revenues. By comparison, an inflationary domestic demand or supply shock (associated with, for instance, a higher propensity to consume, higher wages or larger mark-ups by domestic firms) could lead to higher output and prices for longer (at least until monetary policy reacts) and, thus, to higher tax revenues. The less favourable fiscal effects of an external terms of trade shock – as experienced by the euro area following the Russian war in Ukraine – can be compounded if: (i) inflation is very high, putting stronger pressure on public spending through both discretionary measures and automatic adjustments[7]; and (ii) monetary policy reacts to counter the inflation shock, which may result in a decline in real growth and an increase in the debt burden. The sensitivity to inflation of the government debt-to-GDP ratio[8] depends crucially on the pass-through from inflation to nominal sovereign interest rates and the maturity structure of government debt (the higher the share of short-term debt, the quicker the pass-through of interest rate increases to interest payments).[9]

Turning to the impact of fiscal policy on inflation, one main issue discussed in the literature is the conditions under which fiscal policy considerations influence the price determination process. The early monetarist view holds that inflation, in the sense of sustained increases in price levels, is solely determined by money growth, and fiscal policy plays no role unless it is money-financed.[10] By

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[6] For a model-based analysis of the impact of an external (oil price) versus internal (profit mark-up) supply shock, see de Cos, P.H., Hurtado, S., Marti, F. and Perez, J., "Public finances and inflation: the case of Spain", *Documentos Ocasionales*, No 1606, Banco de España, 2016. A recent analysis (Burriel et al., "Inflation and public finances across EMU countries", *Documentos Ocasionales*, Banco de España, (forthcoming) 2023) for the euro area finds that an external oil shock has a very small and short-lived positive impact on the budget balance (initial increase in revenue and a fall in expenditure), which turns significantly negative and reaches a trough by the middle of the second year following the shock. A demand shock, on the other hand, induces an increase in the budget balance during the first and second years (greater increase in revenues than in spending) after the shock, followed by a fall in the third year.

[7] In certain countries, such as Belgium, some automatic spending adjustments take place only when inflation-based indices exceed 2% (see also Section 3 of this article). A more recent empirical analysis for a panel of euro area countries finds evidence that HICP inflation (actual and surprise) has non-linear effects on the primary balance (inverse U-turn relationship). See Briodeau, C. and Checherita-Westphal, C., "Inflation and public finances in the euro area: is there a threshold effect?", *Occasional Paper Series*, forthcoming, ECB, 2023.

[8] All else being equal, an unexpected increase in inflation erodes the public debt-to-GDP ratio (and the real value of debt) via the "denominator effect" that operates on outstanding debt issued prior to that increase. The interest payments on the existing stock of debt are also directly affected by the higher inflation to the extent that bonds are automatically indexed to inflation. More generally, in line with the theoretical literature, nominal interest rates ultimately adjust to changes in expected inflation through the so-called "Fisher" effect. While the full Fisher effect posits a one-to-one adjustment in nominal interest rates, some empirical evidence points to a partial effect, typically on the ten-year benchmark sovereign yield (see Attinasi, M.G. et al., op. cit.).

[9] For a quantification of the costs and benefits of inflation surprises for government debt, see Andreolli, M. and Rey, H., "The Fiscal Consequences of Missing an Inflation Target", *NBER Working Paper Series*, No 30819, National Bureau of Economic Research, January 2023. The effects can be sizeable, and they crucially depend on debt level and maturity.

[10] For an overview of theoretical approaches (and historical trends), see Bordo, M.D. and Levy, M.D., "Do enlarged fiscal deficits cause inflation? The historical record", *Economic Affairs*, Vol. 41, No 1, February 2021, pp. 59-83.

contrast, according to the so-called fiscal theory of the price level[11], an unbacked fiscal policy expansion – a public debt increase that is not matched by (expected) higher future primary surpluses – implies that economic agents perceive that their real wealth has increased, leading to higher consumption and prices. More generally, if the present value of future primary surpluses is less than the amount of outstanding nominal debt, the equilibrium price level must increase (reducing the real value of debt) to assure fiscal solvency if an explicit sovereign default is excluded. Finally, in widely used macroeconomic models such as New Keynesian models, discretionary fiscal policy – in conjunction with monetary policy – can be an effective short-run macroeconomic stabilisation tool. This is especially the case in situations where monetary policy is constrained at the lower bound or in deep recessions, when fiscal policy can help prevent deflationary episodes.[12]

The empirical literature suggests that expansionary fiscal policy tends to lead to higher inflation, although the evidence is not always conclusive. Surveys of historical records find that this is especially the case in wartime, when fiscally stressed governments resort to inflation to erode their debt, or in cases of financial repression, such as those that occurred between the mid-1960s and the early 1980s.[13] Some recent studies for the euro area find that fiscal policy has a temporary effect on inflation, especially through the output gap channel and for specific instruments, particularly indirect taxes and government consumption through the public wage component.[14]

3 How does inflation affect public finances in the euro area?

Focusing on the current inflation episode, this section provides estimates for both the automatic and the discretionary impact of high inflation on euro area public finances. The discretionary component is defined as the fiscal policy measures adopted by governments to alleviate the burden of high energy prices and inflation on households and firms, as assessed in the December 2022 Eurosystem staff projections.[15] The automatic impact refers to all other reactions of revenues and nominal expenditures to inflation, where the expenditure side covers the indexed

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[11] For more information about the development of this theory, see (among others): Leeper, E.M., "Equilibria under 'active' and 'passive' monetary and fiscal policies", *Journal of Monetary Economics*, Vol. 27, No 1, February 1991, pp. 129-147; and Sims, C.A., "A simple model for study of the determination of the price level and the interaction of monetary and fiscal policy," *Economic Theory*, Vol. 4, May 1994, pp. 381-399. For a comprehensive discussion, see Cochrane, J., *The Fiscal Theory of the Price Level*, Princeton University Press, 2023.

[12] Work stream on monetary-fiscal policy interactions, "Monetary-fiscal policy interactions in the euro area", *Occasional Paper Series*, No 273, ECB, September 2021.

[13] See the review of the historical record in Bordo, M.D. and Levy, M.D, op. cit.; and Reinhart, C. and Sbrancia, M., "The liquidation of government debt", *Economic Policy*, Vol. 30, No 82, April 2015, pp. 291-333.

[14] For a review of the recent empirical literature and an analysis for euro area countries, see Checherita-Westphal, C., Leiner-Killinger, N. and Schildmann, T., "Euro area inflation differentials: the role of fiscal policies revisited", *Working Paper Series*, No 2774, ECB, February 2023. Evidence for the role of several fiscal instruments, in particular indirect taxes and government consumption, is also found in the box entitled "Fiscal policy and inflation in the euro area: a VAR-based analysis", in Work stream on monetary-fiscal policy interactions, op. cit.

[15] Based on the fiscal questionnaires provided by the Eurosystem members of the Working Group on Public Finance. This updates the analysis presented in the box entitled "Euro area fiscal policy response to the war in Ukraine and its macroeconomic impact", *Economic Bulletin*, Issue 5, ECB, 2022.

budget items, as well as estimated nominal adjustments to inflation. Finally, this section provides estimates for the impact of inflation on the budget balance and government debt. The estimates are provided for the euro area aggregate following a bottom-up approach at the country level.

Discretionary fiscal support in reaction to high energy prices and inflation

Euro area discretionary fiscal measures in response to the energy and inflation shock are estimated to be significant in size in 2022-23. Fiscal support increased strongly in 2022 (Chart 1, panel a) in response to the spike in energy prices and inflation following Russia's invasion of Ukraine.[16] In the context of government approval of draft budgets for 2023, some of these measures have been extended and additional support was introduced for this year, bringing the total gross stimulus close to 2% of GDP in both years. The ultimate budget impact of these measures is clouded in uncertainty. In addition to the general intricacies related to their specific design and implementation, some of these measures depend on developments in the market prices of energy.[17] This is particularly the case for measures that affect prices directly. While difficult to classify precisely, about half of the total support in the euro area over the 2022-23 period is assessed as affecting prices directly (via lower marginal costs of energy consumption), with income measures making up the remainder.[18] Similarly, although estimates vary according to the methodology employed, about 12% of the total support is estimated to target vulnerable households and, to a smaller extent, firms directly affected by the hike in energy prices (Chart 1, panel b).[19] Since the cut-off date of the December 2022 projections, some countries have announced their intention to recalibrate some of the previously approved across-the-board measures to make them more targeted. In terms of composition by fiscal instrument, most measures over 2022-23 take the form of "net indirect taxes" – reductions in indirect taxes and increases in subsidies.

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[16] Additional support has been granted in response to the war (for defence, refugee support, etc.), bringing the total estimate for energy and other war-related support to around 2.1% of GDP over 2022-23, 0.7% of GDP in 2024 and 0.5% of GDP in 2025. This refers to fiscal support measures with an impact on the general government budget balance. In addition, euro area governments extended liquidity support for firms affected by the war and the energy crisis in the form of equity acquisitions (with an impact on public debt through the deficit-debt adjustment) and government guarantee schemes (which represent contingent liabilities and can only affect the budget balance when called).

[17] Fiscal measures for which the costs depend on market prices for energy are diverse, but most importantly they refer to price ceilings for gas and electricity, where the government pays or reimburses energy providers for any price differences above the imposed ceiling.

[18] At the country level, the share of measures that have a direct impact on prices is higher in the majority of countries. In Germany, the gas and electricity price brake measures, which are very large in terms of budget impact, are assessed as "income" support since households and firms receive transfers that depend on their past energy consumption. Nonetheless, such measures (classified mostly as subsidies) are assessed as having a direct impact on lowering prices over the period in which they are applied.

[19] In the Eurosystem staff assessment in the context of fiscal projections, some form of means-testing needs to be applied for a measure to be classified as targeted. In addition, some measures are classified as "Other" (see notes to Chart 1, panel b). If this category is removed, the share of targeted measures for the euro area increases to 21% for 2022. In its 2022 Autumn Package, the European Commission estimates that around 25% of the EU-wide support in 2022 was targeted.

Transfers, in particular to households, also accounted for a significant share, especially in 2022.

Chart 1

Euro area discretionary fiscal measures in response to high inflation

a) Size of support and composition by fiscal instrument over the projection horizon

(percentages of GDP, annual levels)

- ● Total gross support
- ■ Subsidies
- ■ Other transfers
- ■ Government consumption
- ■ Indirect taxes
- ■ Direct taxes and social contributions
- ● Net support
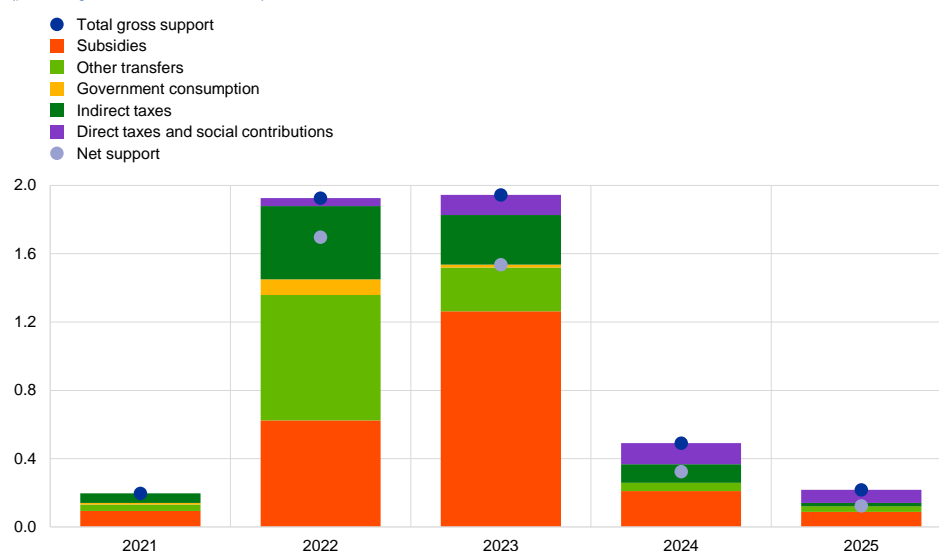
b) Targeting of fiscal support over 2022-23

(percentages of total 2022-23 support)
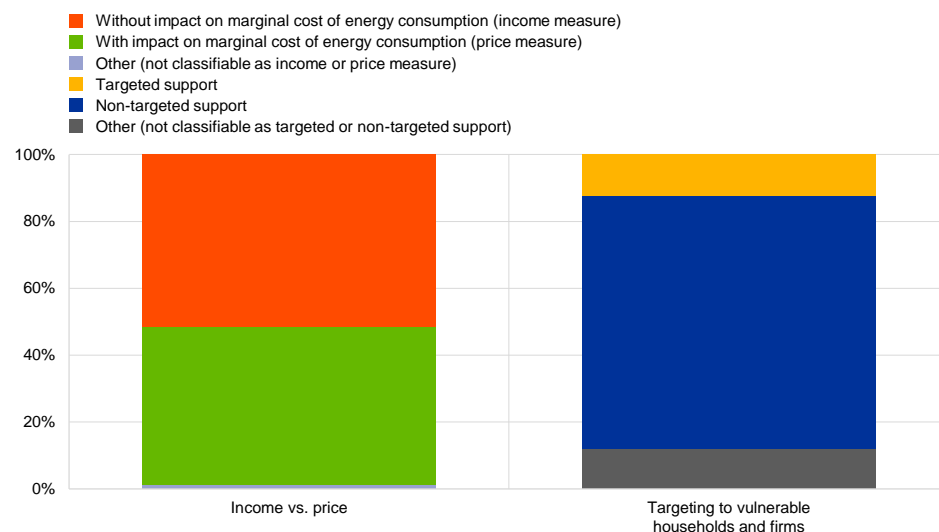
- ■ Without impact on marginal cost of energy consumption (income measure)
- ■ With impact on marginal cost of energy consumption (price measure)
- ■ Other (not classifiable as income or price measure)
- ■ Targeted support
- ■ Non-targeted support
- ■ Other (not classifiable as targeted or non-targeted support)

Source: ECB calculations based on the December 2022 Eurosystem staff macroeconomic projections for the euro area.
Notes: Panel a) – the size of the bars denotes the budget balance impact of stimulus measures (gross terms). "Net support" denotes the gross budget support, adjusted for discretionary financing measures (mostly taxes on energy sector windfall profits). "Other transfers" mostly denotes transfers to households.
Panel b) – the shares are calculated based on the total policy measures in 2022 and 2023. The categories 'Other (not classifiable as income or price)' includes e.g. government purchases to fill gas storage. "Other (not classifiable as targeted or non-targeted)' includes, in addition, equity support to gas dealers. For households, a measure is considered targeted if there is some form of means-testing. For firms, a measure is considered targeted if it applies to specific energy-intensive activities as defined by the European Commission.

Fiscal support in response to high energy prices and inflation is currently expected to be largely withdrawn over 2024-25. Broadly based on measures approved in the context of 2023 budgets, the December 2022 Eurosystem projection

baseline for 2024 embeds fiscal support of around 0.5% of GDP (down from close to 2% of GDP in 2023), as many measures are set to expire, or their budget impact is expected to fade. About half of the stimulus in 2024 relates to further subsidies, while the rest consists mainly of extensions of cuts in energy prices and other indirect taxes, as well as inflation compensation measures in the form of lower direct taxation. A further withdrawal of measures is assumed for 2025, bringing their estimated budget cost down to 0.2% of GDP. Overall, the size of these measures over the projection horizon will depend on governments' further fiscal policy decisions, as well as future energy price and inflation developments.

The automatic reaction and other adjustments of public finances to high inflation

At the euro area aggregate level, the share of automatically indexed expenditure in 2022 is estimated to be almost one-third of total government expenditure. As shown in Chart 2, most of this spending (around three-quarters) is indexed to inflation (price indices), while the rest is mainly indexed to wages (economy-wide wages, minimum wage). The indexation, especially for pensions and wages[20], is mostly backward-looking and lagged by one year. Public pensions make up the largest share of total expenditure (21%), followed by unemployment benefits and other social benefits in cash (6%) and public wages (4%). Finally, "other spending" (1%) refers mostly to interest payments related to inflation-indexed debt.

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[20]   For details on these two major items, see Checherita-Westphal, C. (ed.), "Public wage and pension indexation in the euro area: an overview", *Occasional Paper Series*, No 299, ECB, August 2022. In some cases, the indexation to past inflation is only partial or has a longer lag. For instance, in Italy public wages are automatically indexed to inflation based on national CPI excluding energy. This is done retrospectively at the end of the three-year wage agreement.

Chart 2

Automatic indexation of public spending in the euro area in 2022

(percentages of total public expenditure at euro area aggregate level)

- Total
- Indexed to prices
- Indexed to wages and other nominal variables
- Public wages
- Public pension
- Unemployment benefits
- Other social benefits in cash
- Other
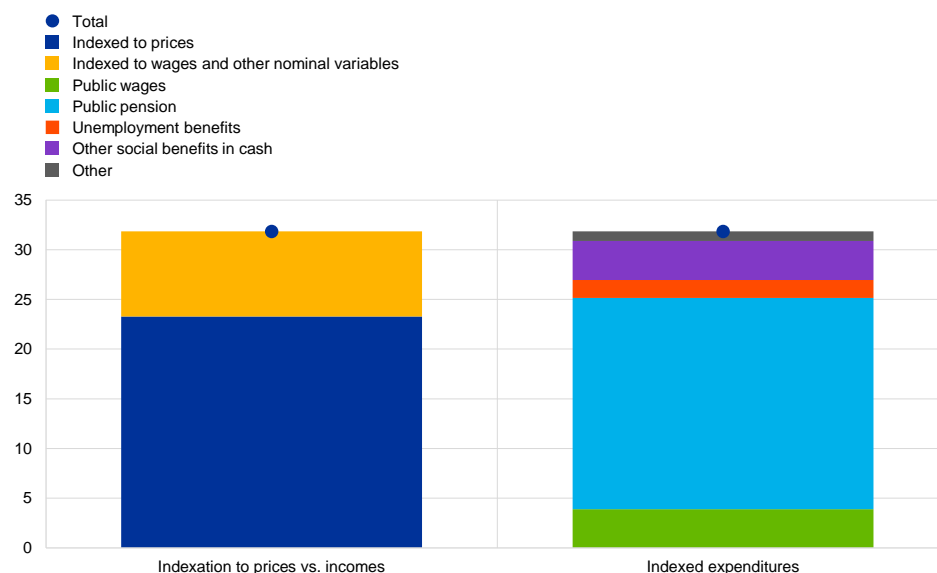
Source: ECB staff calculations based on a Working Group on Public Finance questionnaire.
Note: Data are aggregated at euro area level, based on a bottom-up approach at country level.

In addition to automatic indexation, an unanticipated increase in the prices of goods and services has direct consequences for other government spending. While nominal expenditures are approved annually in a discretionary manner in the context of the budgetary process, which is usually anchored in medium-term strategies, an inflation shock – especially when large – is likely to at least partly feed into nominal public spending, even in the short run. This is particularly the case for government purchases of goods and services and, to some extent, also investment (the latter may be set by longer-term contracts, in which case high inflation could lead to delays in execution).

Estimated impact of the inflation surprise on the euro area budget balance

This subsection attempts to gauge the effect of inflation on the euro area budget balance that materialises even without governments implementing discretionary fiscal measures. The analysis follows a bottom-up (country-by-country) approach and makes use of the ECB fiscal projection model, which embeds a broad set of fiscal variables that are linked to prices. Most notably, it accounts for country-specific spending indexation arrangements, as described in the previous subsection.[21] As a result, this analysis examines the direct (partial) effect of the

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[21] This was part of an extension of the fiscal projection platform prepared for the purpose of this analysis. The extension was possible thanks to information collected from the Eurosystem members of the Working Group on Public Finance through a standard questionnaire on the indexation of expenditure items.

inflation surprise that materialised within the last year on the budget balance (including its components) over the 2022-24 period. [22]

The inflation surprise used in the simulation is proxied by the price forecast revisions since inflation started surging in the euro area. The reference projection exercise for calculating the revisions is the December 2021 Eurosystem staff projections.[23] Since then, inflation prospects, especially for 2022 and 2023, have been significantly revised upwards (Chart 3, panel a). The import price deflator, in particular, has recorded the largest revision, pointing to the mainly external nature of the inflation shock. This contributed to large revisions in the overall HICP and the household consumption deflator – both indices with a meaningful import content. Other domestic price indices, like the GDP deflator and average compensation, were subject to only limited upward revisions. The simulations therefore solely evaluate how the budget balance and its components are affected by the revisions to price variables (i.e. real and financial variables are kept constant as per the partial-equilibrium nature of the analysis and the foreseen discretionary fiscal measures are not taken into account).

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[22]   As a partial equilibrium framework, the platform depicts only the most direct link between prices and fiscal variables and, as such, it does not capture all forces at play. Most notably, it lacks the capacity to represent the dampening effect of an inflationary shock on consumption or the impact of monetary policy tightening. Considering these indirect channels would tilt the assessment of the impact of inflation on the budget balance in a more negative direction. In a similar vein, the standard tax elasticities of the platform will not capture the materialisation of the tax buoyancy observed in some countries, in particular in relation to indirect taxes and direct taxes on corporations amid the post-pandemic recovery and strong expansion in nominal bases. This, by contrast, constitutes an upside risk for the analysis.

[23]   Proxying the inflation surprise as the difference between two forecast rounds is in line with other recent exercises conducted in an empirical framework, such as the IMF's 2022 World Economic Outlook.

Chart 3

The inflation surprise and its effects on the euro area budget balance

a) Inflation surprise: revisions to price variables in the December 2022 versus December 2021 Eurosystem projections

(deviations in cumulative growth rates, percentage points)

- GDP deflator
- Household consumption deflator
- HICP
- HICP excluding energy
- Total investment deflator
- Compensation per employee
- Import deflator
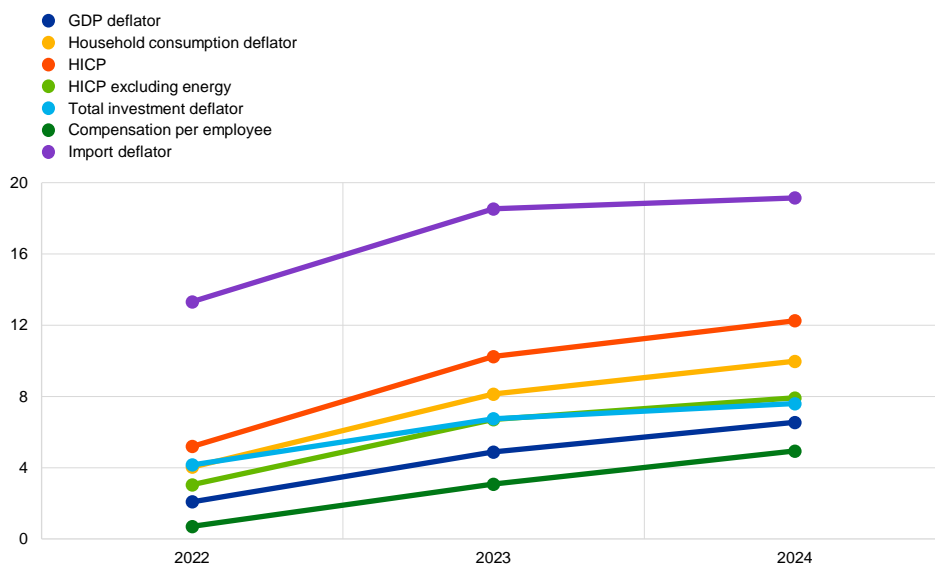
b) Direct (partial) effect of the inflation surprise on the budget balance and overall budget balance revisions

(percentages of GDP; dotted line = percentage points)
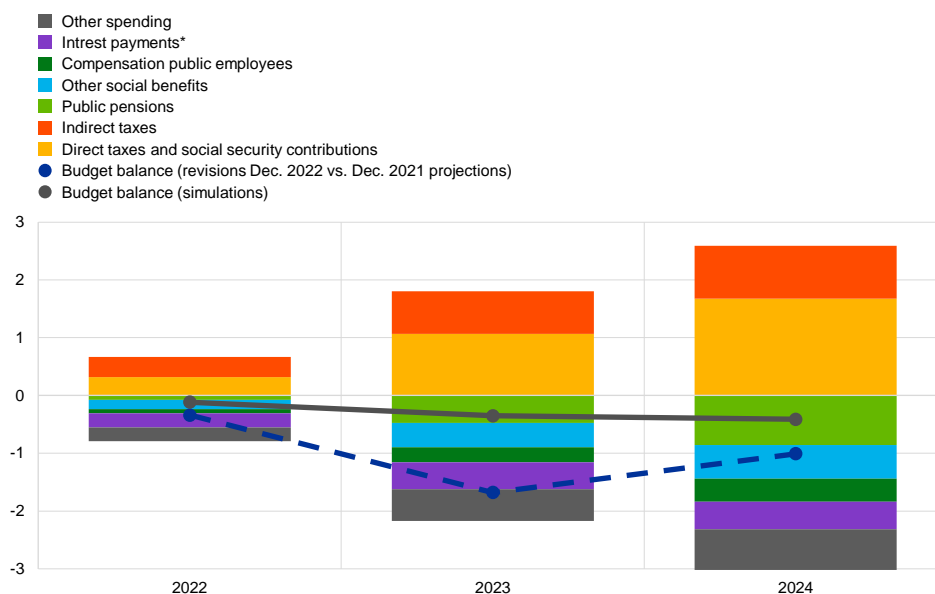
- Other spending
- Intrest payments*
- Compensation public employees
- Other social benefits
- Public pensions
- Indirect taxes
- Direct taxes and social security contributions
- Budget balance (revisions Dec. 2022 vs. Dec. 2021 projections)
- Budget balance (simulations)

Source: ECB staff calculations based on the December 2021 and December 2022 Eurosystem staff macroeconomic projections for the euro area.
Notes: Panel b) – the black budget balance line and the bars (its components) reflect the simulation results of the direct (partial) impact (automatic indexation and other adjustments) of the inflation surprise. These exclude the discretionary response of fiscal policy described at the beginning of this section and the indirect effects, such as the impact of monetary policy reaction on interest payments, output and tax bases. For example, the category "interest payments*" in this chart captures only the direct impact of the inflation revisions on interest payments related to inflation-indexed bonds. All effects of indirect channels, including the full interest payment impact and discretionary fiscal policy reaction – together with other factors – are captured in the dotted line, which denotes total revisions in the budget balance-to-GDP ratio between the December 2022 and December 2021 projection vintages. The category "Direct taxes and social security contributions" denotes the impact on these items, which are paid by both households and firms.

According to the simulations, it takes one year for the euro area budget balance to be adversely affected by the inflation surge (Chart 3, panel b). The

limited, albeit instantaneous, rise in taxes and the partial reaction on the expenditure side lead to a broadly neutral overall effect on the budget balance in 2022. In subsequent years, however, spending pressures intensify and more than offset the benefits on the revenue side, leading to nearly 0.5% of GDP deterioration in the budget balance level in 2024. The overall slight adverse impact of price pressures on public finances derives from the nature of the inflation surprise, which is predominantly originating from an external supply shock. This type of inflation leads to more limited gains on the revenue side, which in turn can easily be outweighed by extra spending pressures.[24] As explained before, the simulations in this framework capture the "direct" impact of the inflation surprise on the primary balance, while in terms of interest payments the impact is limited to inflation-indexed bonds. Thus, the effects are likely to be a lower-bound estimate since the exercise is not incorporating other relevant channels, such as a dampening effect of the monetary policy tightening on the real economy or the discretionary response of fiscal policy described at the beginning of this section. These channels (together with other factors that may not be directly related to the high inflation shock) are captured in the (much larger) revision of the fiscal balance between the December 2021 and December 2022 Eurosystem staff projections (dotted line in Chart 3, panel b).

Estimated impact of the inflation surprise on euro area public debt

As regards the euro area public debt-to-GDP ratio, only considering the revisions to prices would imply a favourable impact of the inflation surprise through the effect on the denominator. The simulations conducted in line with the methodology laid out in the previous subsection point to a fall of close to 5 percentage points in the debt-to-GDP ratio in 2024. This is caused by the denominator effect on account of the revisions to the GDP deflator, which is assessed as growing by about 6 percentage points more than in the projections from one year ago. However, these results do not reflect all the consequences of inflation (and the monetary policy reaction to it), such as the increase in the cost of financing (except for inflation-indexed bonds), the downside revisions to real growth or the discretionary fiscal measures implemented in response to the high inflation. By contrast, the revisions compared with December 2022, which recognise all these factors (including some unrelated to the inflationary shock), point to a rise in the debt-to-GDP ratio (see dotted line in Chart 4, panel a) and its full decomposition in Chart 4, panel b). For longer-run effects, stylised simulations of an inflationary external supply shock in a general equilibrium framework lead to similar conclusions (Box 1).

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[24] The fiscal forecasting model of the ECB embeds tax elasticities, which link tax receipts to macro bases. When justified, particularly for the progressive income taxes, their values exceed unity in order to capture the fiscal drag (see part 2). In some countries, discretionary measures taken to adjust the tax brackets to the high inflation are captured under the fiscal support shown in section 3.1.

Chart 4

The inflation surprise and its effect on the euro area government debt ratio

a) Direct (partial) effect of price revisions in the December 2022 versus December 2021 Eurosystem projections on the debt-to-GDP ratio

(percentage points)

- 🟩 Snowball (deflator growth)
- 🟧 Snowball (real growth)
- 🟦 Snowball (implicit interest rate*)
- 🟥 Deficit-debt adjustment
- 🟪 Primary deficit
- ⚫ Debt-to-GDP ratio (revisions Dec. 2022 vs. Dec. 2021 projections)
- 🔵 Debt-to-GDP ratio
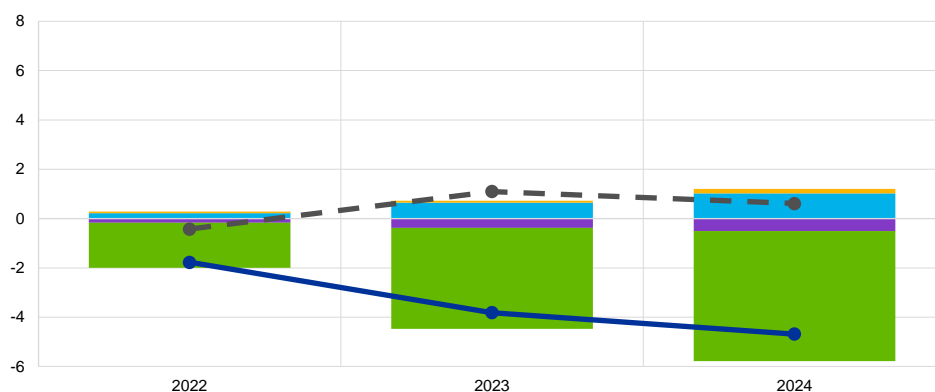
b) Decomposition of the overall revisions in the debt-to-GDP ratio in the December 2022 versus December 2021 Eurosystem projections

(percentage points)

- 🟩 Snowball (deflator growth)
- 🟧 Snowball (real growth)
- 🟦 Snowball (implicit interest rate)
- 🟥 Deficit-debt adjustment
- 🟪 Primary deficit
- ⚫ Debt-to-GDP ratio (revisions Dec. 2022 vs. Dec. 2021 projections)
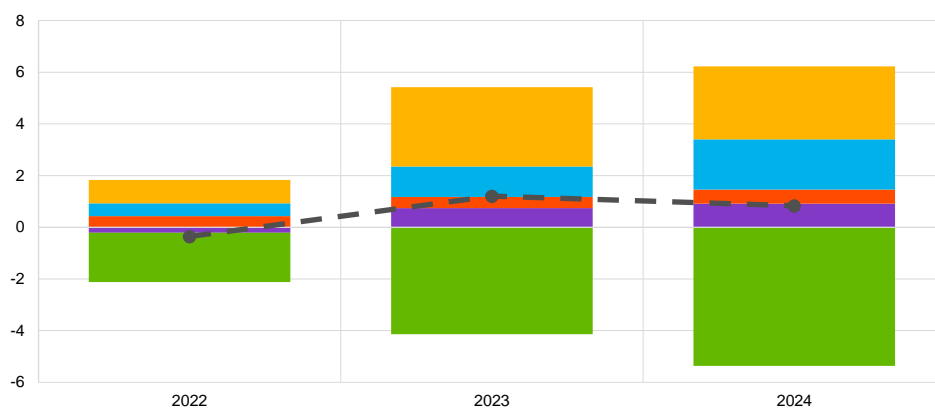
Source: ECB staff calculations based on the December 2021 and December 2022 Eurosystem staff macroeconomic projections for the euro area.
Notes: The snowball effects in both charts refer to the change in the debt-to-GDP ratio on account of the differential between the effective interest rate paid on the stock of debt and the nominal GDP growth (further decomposed in the chart into real GDP growth and GDP deflator growth).
Panel a) illustrates the effect of the revisions to price variables on the debt-to-GDP ratio only, consistent with the methodology followed in the previous subsection. In this context, the category of "Snowball (implicit interest rate*)" reflects only the direct impact of the inflation revisions on interest payments related to inflation-indexed bonds. The dotted line denotes revisions in the debt-to-GDP ratio between the December 2022 and December 2021 projection vintages, excluding base effects of revisions in the debt ratio from 2021.
Panel b) reflects the overall revisions in the debt-to-GDP ratio and its drivers between the December 2021 and December 2022 Eurosystem staff projections.

Box 1

Stylised simulations of the longer-run effect of an inflationary shock on government debt in a general equilibrium framework

This box examines the implications of a stylised inflationary supply shock on the euro area's government debt outlook using a general equilibrium approach. The simulation results show that a negative impact on economic activity from an adverse external supply shock may outweigh the positive impact of higher inflation on debt ratios, while an internal demand shock would reduce the debt burden in the medium term.

The analysis aims to illustrate the main propagation channels of a standardised external adverse shock to terms of trade, resembling certain features, but not the size, of the recent inflation increase. The shock is calibrated to lead, in the absence of a monetary policy reaction, to a 1 percentage point increase in HICP inflation over three years. It is designed as a series of unexpected cost push shocks originating in the rest of the world on their export of goods. To illustrate the difference compared with an internal demand-driven shock, a favourable domestic risk premium reduction shock is also considered over three years, which would boost internal demand and, therefore, inflation. These two shocks are analysed using the Euro Area and Global Economy (EAGLE) model[25], a multi-country dynamic stochastic general equilibrium (DSGE) model calibrated for the four largest euro area countries, the rest of the euro area and the rest of the world.[26] No discretionary fiscal policy measures in response to the inflation shock are considered. As regards the automatic reaction of public finances, a simplified approach is applied based on the analysis in Section 3. Similarly to the baseline projections in the Eurosystem staff macroeconomic projections for the euro area, as of 2025 the structural balance is projected to record some improvement. Monetary policy is assumed to react to the HICP inflation shock by increasing the main financing rate according to a standard Taylor rule. The induced sequence of interest rate increases will be fully passed on to short-term sovereign debt yields and, through the expectations component, partially passed on to long-term rates.

In the case of an external supply shock with a standard Taylor rule monetary policy reaction, the simulations show an adverse impact on the debt-to-GDP ratio, mainly through the real GDP channel that dominates the favourable impact from higher inflation (Chart A, panel a). In this scenario, the shock has a detrimental impact on economic activity. The fall in GDP is due to two main factors: the direct recessionary effects of an import price increase and the monetary policy reaction to counteract the ensuing higher inflation. Their impact is exacerbated by the unexpected nature of the shock.[27] The effect of lower GDP is estimated to be at least twice as large as the positive debt ratio-reducing effect of the higher GDP deflator. The cumulative effect on the debt ratio would be significant over the ten-year horizon.

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[25] For a detailed description of the model, see Gomes, S., Jacquinot, P. and Pisani, M., "The EAGLE: A model for policy analysis of macroeconomic interdependence in the euro area", *Economic Modelling*, Vol. 29, No 5, September 2012, pp. 1686-1714.

[26] To limit the substitutability between imported goods from the rest of world and euro area tradable goods, the elasticity has been lowered to take into account euro area countries' high dependency on commodities imports.

[27] Simulations of a shock of the same size that is fully expected by economic agents show a lower negative impact on GDP and therefore a less unfavourable impact on the debt-to-GDP ratio.

Chart A

The impact of an inflationary shock on the government debt-to-GDP ratio – aggregate of four largest euro area countries

a) External supply shock

(percentage points)

- ■ Structural primary deficit
- ■ Cyclical component
- ■ Snowball (real growth)
- ■ Snowball (implicit interest rate)
- ■ Snowball (deflator growth)
- ● Debt-to-GDP ratio
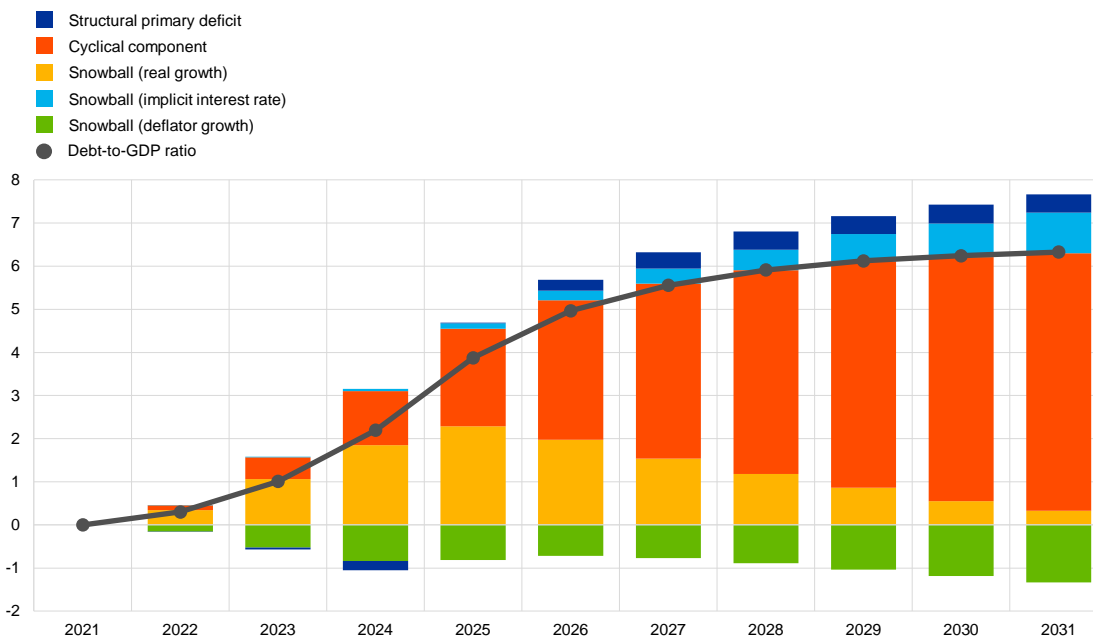
b) Internal demand shock

(percentage points)

- ■ Structural primary deficit
- ■ Cyclical component
- ■ Snowball (real growth)
- ■ Snowball (implicit interest rate)
- ■ Snowball (deflator growth)
- ● Debt-to-GDP ratio
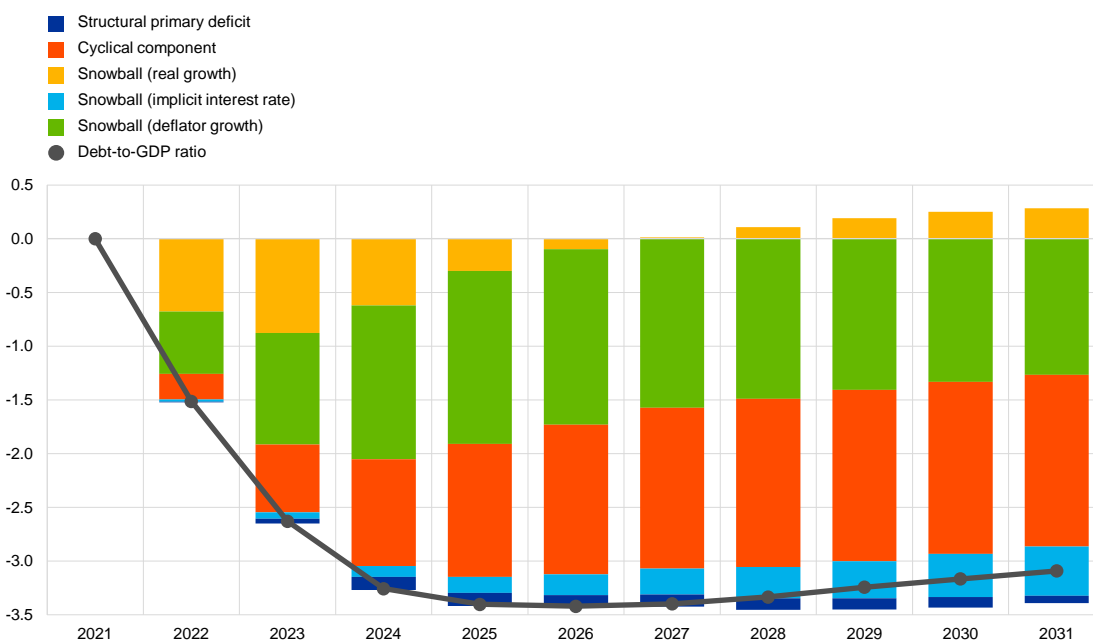
Source: ECB staff calculations.
Notes: In this chart, the contributions from the structural primary deficit and the cyclical component add up to the contribution of the primary deficit (see also the notes to Chart 4 in the main text for the other components included in the debt ratio decomposition). The strong cumulative contribution of the cyclical component stems from the fact that the output gap is only expected to close over the simulation horizon and not to return to positive territory (standard features in DSGE models). Therefore, the budgetary losses are not compensated for, even though the GDP level will ultimately return to its steady state (potential GDP).

In the case of high inflation driven by internal demand, the effect on real GDP and the debt outlook would be mildly favourable (Chart A, panel b). In this scenario, economic agents will increase their consumption and investment as they expect the real interest rate in the economy to decline.[28] As a result, the debt ratio would benefit from two debt-reducing effects: (i) higher real GDP growth and its positive effects on the denominator and the budget balance; (ii) higher inflation and therefore a higher GDP deflator (denominator effect). The two sets of results should be viewed as polar opposites, as the inflationary period the euro area has been experiencing since mid-2021 is very likely the result of a combination of supply and, to a lesser extent, demand-side shocks.

4 How does fiscal policy affect inflation and growth in the euro area?

This section uses model simulations to assess the impact of discretionary fiscal policy measures on inflation and growth in the euro area. The simulations distinguish between the impact stemming from: (i) discretionary fiscal support in response to high energy prices and inflation (Chart 1); and (ii) all remaining discretionary fiscal policy measures embedded in the December 2022 projection baseline. The latter include consolidation measures related to the financing of the energy packages and the partial reversal of support related to the COVID-19 crisis and subsequent recovery. The macroeconomic effects of these fiscal shocks are aggregated at the euro area level, based on country-specific simulation results in the context of the Eurosystem staff projections.[29] The simulation results are surrounded by significant uncertainty stemming from the size, design and transmission of the fiscal shocks given their unprecedented nature. These shocks are in turn contingent on developments in the price of energy and other fiscal policy decisions.

The discretionary fiscal support to shield the euro area economy from high inflation is estimated to have positive growth effects while reducing inflationary pressures, over 2022-23. However, these effects are broadly reversed over the rest of the projection horizon. This is mainly because the fiscal support in response to the energy shock is assessed to be temporary and, based on currently approved policies, to be mostly withdrawn as of 2024. The fiscal support is estimated to have reduced inflation in 2022 and to lower it further in 2023, with a broad reversal of the effect in 2024 and 2025, leading to stronger inflation persistence. Overall, given the nature and composition of the fiscal response (as described in Section 3), its impact on HICP inflation materialises mainly through the energy component. Effects on HICP inflation, which arise from higher demand

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[28] As there is no risk of inflation expectations de-anchoring, the model does not factor in the negative macro impact of persistently higher inflation. Therefore, the positive effect on real activity should be seen as an upper bound of its expected positive effect.

[29] Alternative simulations have been performed using two other models: Basic Model Elasticities (BMEs) and the ECB-BASE. The BMEs summarise the effects of changes in assumptions (including fiscal assumptions) on macroeconomic variables. Their advantages and limitations are discussed in more detail in ECB, "A guide to the Eurosystem/ECB staff macroeconomic projection exercises", July 2016. For details on 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. In these models, particularly in the ECB-BASE, the effects on HICP inflation are somewhat stronger than those shown in Chart 5.

following the fiscal stimulus, build up more gradually. See Chart 5 (bars) for the simulation results. For a discussion on the distributional impact of the government measures to compensate households for the high inflation, see Box 2.

Chart 5

Macroeconomic effects of euro area discretionary fiscal policy measures

(percentage points)

- Real GDP growth impact of energy/inflation fiscal support (triangles: impact of total fiscal policy measures)
- HICP inflation impact of energy/inflation fiscal support (triangles: impact of total fiscal policy measures)
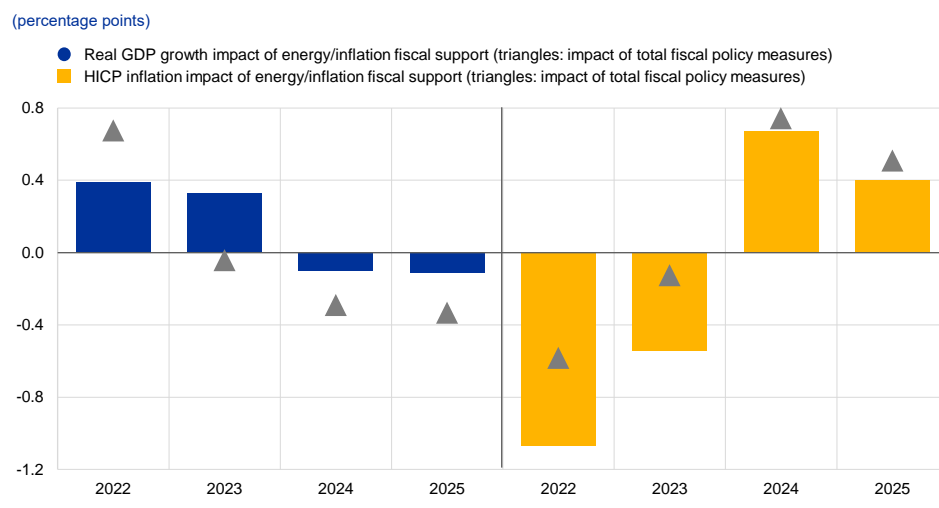
Sources: December 2022 Eurosystem staff macroeconomic projections for the euro area and ECB staff calculations.
Notes: Macroeconomic effects are shown at the euro area aggregate level as percentage point deviations from a baseline without the fiscal policy measures. Simulations are conducted under the simplifying assumption of fiscal shocks being exogenous and there being no monetary policy response.

Beyond the energy and inflation support, the recent discretionary fiscal policy measures have somewhat smaller effects overall, on both growth and inflation over the projection horizon. On account of the timing and composition of the overall discretionary fiscal measures, the impact on growth is assessed to be positive only in 2022, before turning mildly negative in 2023 and more strongly negative over the 2024-25 period, when a larger share of measures, including those related to the COVID-19 crisis and recovery, are withdrawn. The impact on inflation is less pronounced than in the case of the direct energy/inflation compensatory measures in the first two years of the projection horizon, on account of other compensatory measures and the reversal of some of the pandemic-related measures (in particular, a decline in subsidies in 2022 compared with 2021 in some of the largest euro area economies). See Chart 5 (triangles) for the simulation results. Taking into account the cumulative effect of all fiscal stimulus measures embedded in the baseline since 2020 (compared with the pre-pandemic period of 2019), fiscal policy is assessed to continue to have a positive impact on euro area GDP (cumulatively about 2.3 percentage points over the 2020-25 period compared with a scenario of "no fiscal policy change"), but also on HICP (about 0.8 percentage points).

Box 2

The distributional impact of fiscal measures to compensate for high consumer price inflation[30]

Governments across the euro area have made sizeable fiscal efforts to cushion the impact of the current inflationary shock for households. Lower-income households are generally thought to be more strongly affected by high consumer price inflation. This is particularly true for energy price-driven inflation, as lower-income households are more exposed to increases in electricity, gas and heating costs than higher-income households.[31] The measures taken by governments so far are mostly aimed at containing price increases (price measures), but some also support household income directly (see Section 3).

But how successful have euro area governments' inflation compensation measures been in addressing the inflation gap opened by the inflationary shock? This box summarises analyses of the Working Group on Public Finance on the distributional impact of government measures to compensate for high consumer inflation in 2022. The study uses a tax-benefit microsimulation model for the European Union (EUROMOD) with microdata as the input (EU-SILC) for quantifying the impact of income measures, as well as some back-of-the-envelope calculations to assess the distributional impact of price measures.[32] The analysis is partial, in that it does not account for likely substitution effects in consumption away from energy or energy-intensive products for example. It also does not account for the effect on wealth distribution or the distributional effect of future higher public debt repayment.

On average, government measures mitigated about one-quarter of euro area household income loss on account of inflation in 2022 (Chart A). First, measures aimed at containing price increases have temporarily lowered consumer prices. For the euro area aggregate – proxied by the four largest euro area countries as well as Greece and Portugal – consumer inflation is projected to have been above 9% in 2022 (excluding owner-occupied housing and rent). Our estimates suggest that the rise in consumer prices could have been around 1.7 percentage points higher in the absence of price measures, particularly those aimed at limiting the increase in heating, petrol and electricity prices.

Second, measures aimed at supporting household income contributed to the increase in households' nominal disposable income. Overall, a 5.8% increase in disposable income compensated for around 60% of the 2022 rise in inflation in the euro area. Increases were mainly on account of the expected rise in the market component of household income (3.6%), reflecting the indexation of public wages and pensions, among other factors (see Section 3). However, discretionary government income support measures accounted for an increase in disposable income of 0.9 percentage points.[33] These measures include: cash transfers to private households,

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[30] The authors would like to thank Simeon Bischl for his valuable research assistance and contribution to this box.

[31] See the box entitled "Who foots the bill? The uneven impact of the recent energy price shock", *in this issue of* the Economic Bulletin. On the concept of energy poverty, see Faiella, I. and Lavecchia, L., "Energy poverty. How can you fight it, if you can't measure it?", *Energy and Buildings*, Vol. 233, February 2021.

[32] The full analysis using an extended version of EUROMOD and consumer survey data is presented in Amores, A. et al., "The distributional impact of fiscal measures to compensate consumer inflation", *Occasional Paper Series*, ECB, forthcoming.

[33] Other factors contributing to disposable household income growth are government measures not directly linked to inflation, such as changes in income tax rates or brackets, and changes to benefits.

families with children, students or pensioners; increases of transport subsidies for commuters; and income tax allowances or reductions that are assumed to be usually of a temporary nature.

Chart A

Consumer inflation and nominal disposable household income in the euro area

(percentage changes in equivalised disposable household income per decile)

- Discretionary fiscal support to household income
- Other nominal income growth
- Nominal market income growth
- Disposable income growth
- Consumer price inflation excluding housing and rents
- Counterfactual inflation excluding price measures
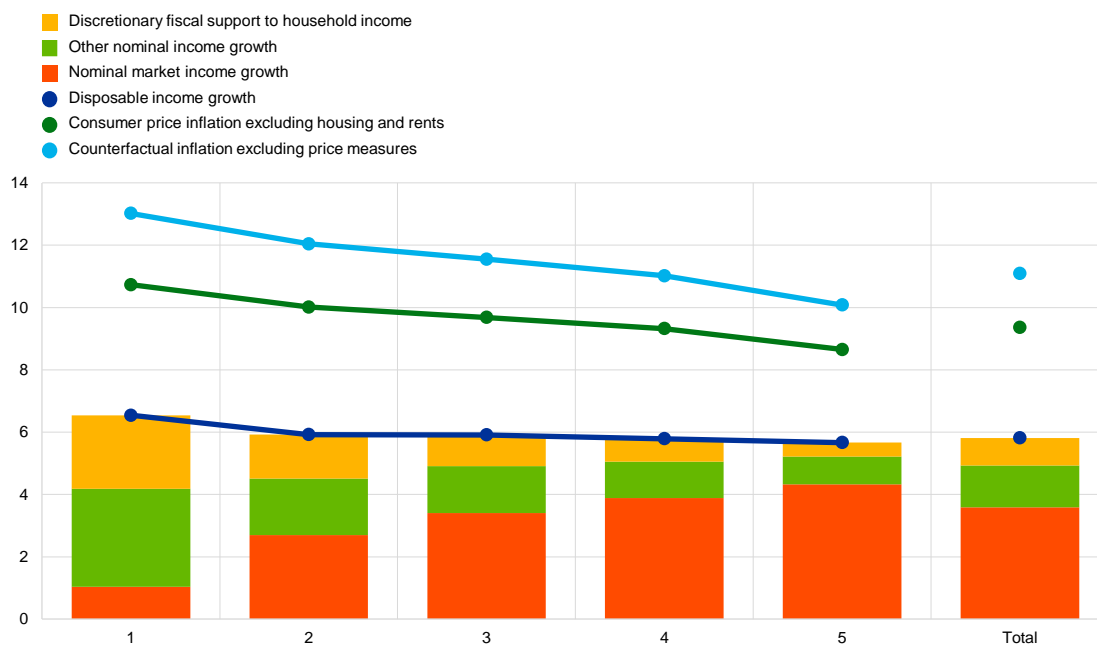
Source: ECB staff calculations.
Notes: Results for nominal disposable income growth are based on microsimulations with EUROMOD using EU-SILC data. Data on quintile-specific consumer inflation update those presented in the box entitled "The impact of the recent rise in inflation on low-income households", *Economic Bulletin*, Issue 7, ECB, 2022, based on Eurostat data. Consumer price inflation differs from the HICP rate as it does not include owner-occupied housing and rent, among other variables. Counterfactual consumer price inflation assumes household energy expenditure would have been higher by the same volume as the volume of price measures adopted by government. The calculation accounts for quintile-specific energy expenditure.

While the bulk of measures did not target only lower-income households, they did mitigate the inflation gap created by high inflation to some degree (Chart A). Households in the lower quintiles of the income spectrum experienced higher consumer inflation than households in the higher-income quintiles.[34] This implies that, for the same nominal disposable income growth, lower-income households will have had a stronger decline in purchasing power than high-income households. This gap amounts to around 2 percentage points between the lowest and the highest-income quantile, and could have been even bigger in a counterfactual scenario without price measures (close to 3 percentage points). Price measures benefited lower-income households somewhat more on account of the higher shares of energy and energy-intensive products in their consumption baskets.[35] All households benefited from the fiscal measures on the income side. Some of these measures specifically targeted the lowest-income households. As a result, they increased household income by 2.4 percentage points in the lowest quintile, where they contributed to more than one-third of total disposable income growth. At the same time, they accounted for around 0.4 percentage points of disposable income growth for the richest household quintile. Overall, the

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[34] See the box entitled "The impact of the recent rise in inflation on low-income households", *Economic Bulletin*, Issue 7, ECB, 2022.

[35] Given that energy accounts for a greater share of consumption in the lower-income quintiles, price measures reduce quintile-specific inflation more for these households than for households in higher-income quintiles. In absolute terms, however, higher-income quintiles may benefit more from price measures than lower-income quintiles as they consume more energy overall.

inflation gap remaining between the highest and lowest quintile is estimated to be around 1.2 percentage points after taking account of both price and income measures.

When addressing the differential impact of inflation across income groups, there is room for euro area governments to improve the economic efficiency of their fiscal measures. Only about one-tenth of the support is estimated to have targeted lower-income households, which are typically credit-constrained and where higher inflation immediately constrains consumption.[36] Most of the public money benefited households that had the means to more easily weather a temporary rise in consumer inflation unaided. This unnecessarily burdens public finances, which are vulnerable in several euro area countries. At the same time, many early measures aimed at containing energy price increases in 2022 disincentivised the reduction of fossil energy use. Governments should continue recalibrating inflation compensation measures, making them better targeted and more efficient, to also facilitate the green transition.

5   Conclusions

Beyond the short run, euro area public finances may turn out to be negatively affected by the current high inflation episode. This would be the case even without considering governments' discretionary policy response to the high energy prices and inflation (assessed at close to 2% over the 2022-23 period). This negative impact can primarily be explained by the nature and size of the inflation shock in the euro area –mainly a large, external energy shock that generates less tax revenues in relation to its size, negatively affects firms' profitability and growth and puts high pressure on nominal public spending. Moreover, the monetary policy reaction required to avoid this inflation shock leading to undue second-round effects is being translated into an increase in interest payments on government debt. In terms of the euro area debt-to-GDP ratio, the analysis shows that, beyond the short run and conditional on the monetary policy reaction, a negative impact on economic activity from an adverse supply shock may outweigh the positive impact of higher inflation on debt ratios.

In turn, discretionary fiscal policy measures adopted by euro area governments in response to the high energy prices and inflation are found to have significant, but only temporary, macroeconomic and distributional effects. These measures are estimated to lower inflationary pressures over the 2022-23 period, before this effect broadly reverses, leading to higher inflation over the 2024-25 period. The degree to which fiscal measures and their composition will be effective in influencing price dynamics, however, is highly uncertain given their unprecedented nature. The discretionary fiscal support in reaction to the high energy prices and inflation is also found to initially increase GDP growth and support households' nominal disposable income. However, despite being progressive, some fiscal measures are not very efficient from an economic perspective. Only a relatively small share of the support is estimated to target lower-income households.

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[36]   For more information on consumption inequality, see Attanasio, O.P. and Pistaferri, L., "Consumption Inequality", *Journal of Economic Perspectives*, Vol. 30, No 2, 2016, pp. 3-28.

Moreover, the additional burden on public finances, especially if the support is to be extended through more long-lasting measures, may pose additional challenges in an environment of rising interest payments, particularly in highly indebted countries.

The overall fiscal and macroeconomic outcomes depend on many factors, including how fiscal and monetary policy react in the period ahead. Fiscal measures that are not temporary, targeted and tailored to preserving incentives to consume less energy are likely to exacerbate inflationary pressures, which would necessitate a stronger monetary policy response. Fiscal policies should therefore be oriented towards making the euro area economy more productive, rebuilding fiscal buffers and gradually bringing down high levels of public debt.[37]

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[37] ECB, "Monetary Policy Statement", 15 December 2022.

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	1.4	1.7	1.2	0.9	0.0	2.5	0.3
2021	6.3	5.9	7.6	2.1	8.1	5.3	4.0	2.9	4.7	2.6	-0.3	0.9	2.6
2022	.	2.1	4.0	1.0	3.0	3.5	.	.	8.0	9.1	2.5	.	8.4
2022 Q1	0.7	-0.4	0.5	-0.5	1.6	0.6	7.9	5.6	8.0	6.2	0.9	1.1	6.1
Q2	-0.4	-0.1	0.1	1.2	-2.7	0.9	9.7	6.4	8.6	9.2	2.5	2.2	8.0
Q3	1.4	0.8	-0.2	-0.3	3.9	0.4	10.4	7.2	8.3	10.0	2.9	.	9.3
Q4	.	0.7	0.0	0.0	0.0	0.0	.	.	7.1	10.8	3.8	.	10.0
2022 Sep.	-	-	-	-	-	-	10.5	7.6	8.2	10.1	3.0	.	9.9
Oct.	-	-	-	-	-	-	10.7	7.6	7.7	11.1	3.7	.	10.6
Nov.	-	-	-	-	-	-	10.3	7.5	7.1	10.7	3.8	.	10.1
Dec.	-	-	-	-	-	-	.	.	6.5	10.5	4.0	.	9.2
2023 Jan.	-	-	-	-	-	-	.	.	6.4	10.1	4.3	.	8.6
Feb. [3]	-	-	-	-	-	-	.	.	6.0	.	.	.	8.5

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	-3.9
2021	54.9	59.6	55.9	49.4	52.0	54.9	53.7	55.2	52.1	11.2	9.9	12.7
2022	50.6	50.7	53.0	50.3	48.2	51.4	49.9	51.0	47.8	3.3	4.1	2.3
2022 Q1	52.2	54.9	58.3	48.7	48.0	54.2	51.0	52.6	49.1	1.3	2.9	-0.4
Q2	51.7	54.0	55.0	52.1	44.9	54.2	50.2	52.1	48.8	0.0	-0.1	0.2
Q3	50.0	47.2	50.3	50.2	51.8	49.0	49.9	50.1	47.5	0.8	-0.5	2.1
Q4	48.4	46.5	48.5	50.1	47.9	48.2	48.7	48.3	47.0	-2.1	-2.5	-1.7
2022 July	50.9	47.7	52.1	50.2	54.0	49.9	50.7	51.0	48.6	1.3	0.6	2.1
Aug.	49.3	44.6	49.6	49.4	53.0	49.0	49.9	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	0.8	-0.5	2.1
Oct.	49.3	48.3	48.2	51.8	48.3	47.3	49.5	49.2	47.3	0.1	-1.0	1.3
Nov.	48.0	46.4	48.2	48.9	47.0	47.8	48.1	47.9	47.0	-0.9	-1.7	0.0
Dec.	47.9	45.0	49.0	49.7	48.3	49.3	48.6	47.7	46.7	-2.1	-2.5	-1.7

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.

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

						GDP				External balance [1]		
	Total				Domestic demand						Total	Exports [1]	Imports [1]
		Total	Private consumption	Government consumption	Gross fixed capital formation				Changes in inventories [2]			
					Total	Total construction	Total machinery	Intellectual property products				
	1	2	3	4	5	6	7	8	9	10	11	12
Current prices (EUR billions)												
2020	11,456.9	11,047.1	5,924.8	2,565.4	2,516.4	1,222.5	683.7	603.5	40.5	409.8	5,187.5	4,777.6
2021	12,318.5	11,840.8	6,283.7	2,718.4	2,710.6	1,376.3	761.5	565.6	128.0	477.7	6,072.6	5,594.9
2022	13,338.5	13,116.4	7,004.9	2,863.5	3,024.9	1,552.1	839.6	625.6	223.0	222.2	7,302.8	7,080.6
2022 Q1	3,240.6	3,161.5	1,683.2	701.9	721.3	375.5	199.3	144.6	55.1	79.1	1,713.6	1,634.5
Q2	3,306.2	3,239.8	1,732.3	709.7	744.6	387.4	206.3	148.9	53.2	66.4	1,826.0	1,759.6
Q3	3,354.4	3,344.9	1,778.6	717.0	783.7	391.4	215.8	174.5	65.7	9.5	1,889.3	1,879.8
Q4	3,426.6	3,355.2	1,809.5	735.3	766.1	393.6	215.0	155.6	44.3	71.3	1,886.7	1,815.4
as a percentage of GDP												
2022	100.0	98.3	52.5	21.5	22.7	11.6	6.3	4.7	1.7	1.7	-	-
Chain-linked volumes (prices for the previous year)												
quarter-on-quarter percentage changes												
2022 Q1	0.6	-0.3	0.1	0.1	-0.7	2.3	1.3	-9.6	-	-	1.4	-0.6
Q2	0.9	0.9	1.1	-0.1	0.9	-0.2	1.8	2.6	-	-	1.7	1.9
Q3	0.4	1.5	0.9	-0.2	3.9	-0.9	3.0	17.1	-	-	1.7	4.2
Q4	0.0	-1.0	-0.9	0.7	-3.6	-0.9	-1.6	-11.5	-	-	0.1	-1.9
annual percentage changes												
2020	-6.1	-5.8	-7.7	1.0	-6.2	-4.0	-11.8	-3.6	-	-	-8.9	-8.5
2021	5.3	4.2	3.7	4.3	3.8	6.4	9.2	-7.4	-	-	10.6	8.4
2022	3.5	3.7	4.3	1.1	3.7	2.1	4.0	7.1	-	-	7.0	7.9
2022 Q1	5.5	5.7	8.2	3.0	4.0	5.0	1.7	4.6	-	-	8.6	9.4
Q2	4.4	4.6	5.9	0.8	3.0	2.1	2.3	6.0	-	-	7.7	8.4
Q3	2.4	3.8	2.3	0.1	7.7	1.6	7.7	23.1	-	-	7.6	11.1
Q4	1.8	1.1	1.2	0.5	0.5	0.3	4.5	-3.9	-	-	5.0	3.5
contributions to quarter-on-quarter percentage changes in GDP; percentage points												
2022 Q1	0.6	-0.4	0.1	0.0	-0.2	0.3	0.1	-0.5	-0.3	1.0	-	-
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	-0.4	0.2	-0.8	-0.1	-0.1	-0.6	0.1	1.0	-	-
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	5.3	4.2	2.0	1.0	0.9	0.7	0.6	-0.4	0.3	1.3	-	-
2022	3.5	3.6	2.2	0.3	0.8	0.2	0.2	0.3	0.3	-0.1	-	-
2022 Q1	5.5	5.5	4.1	0.7	0.9	0.6	0.1	0.2	-0.2	0.0	-	-
Q2	4.4	4.4	3.0	0.2	0.7	0.2	0.1	0.3	0.6	0.0	-	-
Q3	2.4	3.7	1.2	0.0	1.7	0.2	0.5	1.0	0.8	-1.2	-	-
Q4	1.8	1.0	0.6	0.1	0.1	0.0	0.3	-0.2	0.2	0.9	-	-

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

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	10,326.8	175.3	1,994.7	543.8	1,794.0	544.4	483.2	1,207.7	1,200.5	2,060.3	322.9	1,130.1
2021	11,046.1	188.3	2,170.8	593.7	1,994.9	586.6	495.8	1,243.0	1,286.4	2,152.1	334.5	1,272.4
2022	12,004.9	219.0	2,413.4	654.3	2,312.8	620.3	511.7	1,299.6	1,374.9	2,234.4	364.6	1,333.6
2022 Q1	2,902.2	50.9	582.8	158.6	547.8	151.1	123.8	316.1	336.3	548.0	86.7	338.4
Q2	2,967.4	53.7	600.2	162.1	572.6	154.6	125.5	319.3	341.6	547.6	90.2	338.8
Q3	3,022.5	56.4	601.7	164.5	591.2	155.2	127.9	325.3	345.5	561.6	93.1	332.0
Q4	3,098.2	57.7	633.0	167.9	599.4	158.1	133.9	333.6	351.4	570.7	92.5	328.3
as a percentage of value added												
2022	100.0	1.8	20.1	5.5	19.3	5.2	4.3	10.8	11.5	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	0.6	-0.2	0.9	1.1	0.8	2.4	-1.9
Q2	0.7	-0.7	0.5	-0.7	1.9	2.1	0.3	0.3	0.8	-0.3	4.3	2.0
Q3	0.7	0.6	0.9	-1.2	1.2	0.1	-0.2	-0.2	0.3	1.4	2.9	-2.8
Q4	-0.3	-0.3	0.0	-0.5	-1.2	1.7	-0.2	0.3	0.1	-0.2	-2.8	2.1
annual percentage changes												
2020	-6.0	0.0	-6.4	-5.7	-14.1	1.9	0.5	-0.9	-5.6	-2.8	-17.6	-6.9
2021	5.2	0.1	7.2	4.9	7.8	7.1	2.7	1.7	6.0	3.5	3.6	6.5
2022	3.6	-1.2	2.0	1.5	8.2	5.9	-0.1	2.0	4.2	1.5	11.7	2.2
2022 Q1	5.4	-0.8	2.0	4.6	14.5	6.7	0.1	3.0	6.4	1.9	17.7	6.3
Q2	4.5	-1.8	2.2	1.9	11.7	7.0	0.3	2.3	5.0	1.2	16.7	3.2
Q3	2.7	-1.0	2.5	0.7	5.0	5.3	-0.3	1.5	3.2	1.2	7.1	0.3
Q4	2.1	-1.5	2.2	-0.5	2.9	4.7	-0.3	1.3	2.4	1.8	6.8	-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	0.7	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	4.5	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	0.2	0.2	-
Q4	2.1	0.0	0.4	0.0	0.5	0.3	0.0	0.1	0.3	0.3	0.2	-

Sources: Eurostat and ECB calculations.

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	2.2	2.5	0.9	-0.9	1.2	3.0	3.3	5.7	-0.1	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	-0.3	2.3	4.4	1.8	2.9
Q2	2.7	3.0	0.8	-0.2	1.2	3.4	4.7	6.0	0.2	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	3.8	2.4	1.4	0.6
Q4	1.5	1.6	0.5	-1.2	1.0	2.0	1.7	4.5	0.3	3.3	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	4.0	0.7	6.1
2022 Q1	6.5	6.6	6.5	-2.0	2.0	4.7	16.1	6.3	-0.5	6.2	6.7	1.3	13.6
Q2	3.7	3.9	2.7	-1.9	0.4	2.7	9.9	5.1	-1.4	5.2	3.9	-0.1	6.9
Q3	2.5	2.8	1.0	-1.2	2.0	3.3	3.1	7.0	-0.3	4.9	3.6	1.2	2.5
Q4	2.2	2.2	2.0	-1.2	1.3	2.8	3.0	4.5	0.8	4.3	2.9	1.1	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	-0.9	-0.2	0.1	4.0	-0.2	-0.5	1.9	1.0	-0.8	4.6
2022 Q1	3.4	3.1	5.1	-1.1	0.7	1.2	10.4	0.2	-0.2	3.8	2.2	-0.5	10.4
Q2	0.9	0.9	1.9	-1.7	-0.8	-0.7	4.9	-0.8	-1.6	2.6	0.6	-1.6	5.2
Q3	0.7	0.9	0.1	-0.1	0.6	0.2	1.2	0.7	0.1	1.1	1.2	-0.2	1.9
Q4	0.7	0.5	1.5	0.0	0.3	0.7	1.3	0.0	0.5	0.9	0.9	-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				
						Adult		Youth		Male		Female		
			Millions	% of labour force		Millions	% of labour force	Millions	% of labour force	Millions	% of labour force	Millions	% of labour force	% of total posts
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
% of total in 2020			100.0			80.1		19.9		51.3		48.7		
2020	162.748	3.5	12.968	8.0	3.0	10.385	7.0	2.582	18.1	6.654	7.7	6.314	8.3	1.8
2021	165.135	3.4	12.768	7.7	3.2	10.287	6.8	2.481	16.9	6.502	7.4	6.266	8.1	2.4
2022	.	.	.	6.7	.	.	5.9	.	14.6	.	6.3	.	7.2	3.1
2022 Q1	167.131	3.2	11.363	6.8	2.9	9.227	6.1	2.136	14.1	5.671	6.4	5.692	7.3	3.1
Q2	167.882	3.1	11.216	6.7	2.7	8.943	5.9	2.273	14.6	5.630	6.3	5.586	7.1	3.2
Q3	167.979	3.0	11.301	6.7	2.5	8.901	5.8	2.400	15.4	5.671	6.3	5.630	7.2	3.1
Q4	.	.	.	6.7	.	.	5.9	.	14.4	.	6.3	.	7.1	3.1
2022 Aug.	-	-	11.230	6.7	-	8.904	5.8	2.326	14.9	5.612	6.3	5.618	7.1	-
Sep.	-	-	11.219	6.7	-	8.874	5.8	2.345	15.1	5.612	6.3	5.607	7.1	-
Oct.	-	-	11.173	6.6	-	8.912	5.8	2.262	14.5	5.582	6.2	5.591	7.1	-
Nov.	-	-	11.240	6.7	-	8.960	5.9	2.280	14.5	5.629	6.3	5.611	7.1	-
Dec.	-	-	11.292	6.7	-	9.033	5.9	2.259	14.3	5.625	6.3	5.666	7.2	-
2023 Jan.	-	-	11.244	6.6	-	8.956	5.8	2.289	14.4	5.609	6.2	5.636	7.1	-

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 turnover [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	-5.7	-0.8	3.7	-2.3	-14.4	-9.1	-25.1
2021	8.9	9.8	9.6	11.7	8.1	1.4	5.4	5.1	0.9	7.8	9.6	13.4	-3.1
2022	2.2	3.0	-1.3	5.5	5.3	-3.5	2.3	0.7	-2.8	2.4	6.4	.	-4.1
2022 Q1	1.6	2.1	1.0	0.3	6.5	-1.4	5.7	5.7	-1.7	11.1	12.5	19.9	-13.0
Q2	2.0	2.6	-0.2	4.6	3.2	-1.4	2.3	1.0	-2.8	2.9	7.7	18.9	-16.3
Q3	3.3	3.9	-1.8	9.8	2.9	-1.4	0.7	-0.7	-1.6	-0.8	3.4	15.7	2.2
Q4	2.1	3.5	-4.3	7.2	8.7	-9.1	0.7	-2.6	-5.0	-1.7	3.2	.	16.3
2022 Aug.	4.8	5.6	-0.8	14.1	3.4	-0.8	1.0	-1.3	-1.3	-2.2	4.7	-	4.4
Sep.	6.1	7.2	-2.2	16.4	5.6	-3.4	0.3	0.1	-2.0	0.8	3.6	-	10.3
Oct.	4.2	5.5	-3.1	11.5	9.2	-8.4	1.5	-2.5	-3.9	-2.3	2.1	-	14.9
Nov.	3.6	5.4	-3.4	10.8	9.7	-11.4	1.6	-2.5	-4.5	-2.0	3.7	-	17.9
Dec.	-2.0	-1.1	-7.0	-1.4	7.1	-7.5	-1.3	-2.8	-6.4	-0.9	3.9	-	16.1
2023 Jan.	0.9	2.1	-5.3	8.2	2.9	-7.6	.	-2.3	-5.0	-1.0	5.4	-	.
						month-on-month percentage changes (s.a.)							
2022 Aug.	2.4	2.5	-0.6	4.7	2.2	-0.1	-0.3	-0.1	-0.7	0.3	1.9	-	13.1
Sep.	0.4	0.9	-0.8	0.4	2.2	-1.9	0.1	0.9	0.5	1.4	-0.6	-	4.0
Oct.	-1.8	-1.6	-1.4	0.1	-0.2	-4.4	0.9	-1.4	-1.3	-2.0	-0.1	-	-2.4
Nov.	1.4	1.3	0.5	0.5	1.6	-1.3	0.0	0.7	-0.5	1.7	0.8	-	3.5
Dec.	-1.3	-1.1	-2.7	-0.2	-0.9	3.4	-2.5	-1.7	-2.1	-2.5	0.5	-	3.9
2023 Jan.	0.7	0.8	1.5	-0.2	-2.4	-0.8	.	0.3	1.8	0.8	-1.5	-	-7.1

Sources: Eurostat, ECB calculations and European Automobile Manufacturers Association (col. 13).
1) Including wholesale trade.

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 Q1	111.2	11.9	82.5	-13.7	9.4	1.6	12.6	88.9	57.8	54.7	54.1	54.2
Q2	103.8	6.5	82.4	-22.7	5.4	-5.1	12.5	90.3	54.1	50.4	55.6	54.2
Q3	96.9	1.5	81.9	-26.9	2.8	-6.9	7.2	90.8	49.3	46.3	49.9	49.0
Q4	95.3	-0.8	81.1	-24.4	3.1	-4.8	5.0	90.4	47.1	45.9	49.0	48.2
2022 Sep.	94.4	0.1	-	-28.7	1.3	-7.7	5.0	-	48.4	46.3	48.8	48.1
Oct.	93.8	-0.6	81.4	-27.4	3.0	-5.9	3.3	90.7	46.4	43.8	48.6	47.3
Nov.	95.1	-1.3	-	-23.7	2.7	-5.7	4.0	-	47.1	46.0	48.5	47.8
Dec.	97.1	-0.6	-	-22.0	3.6	-2.6	7.5	-	47.8	47.8	49.8	49.3
2023 Jan.	99.8	1.2	80.9	-20.7	1.4	-0.7	10.4	90.2	48.8	48.9	50.8	50.3
Feb.	99.7	0.5	-	-19.0	1.8	-0.1	9.5	-	48.5	50.1	52.7	52.0

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	2.5	3.9	7.0	5.2	47.7	24.2	75.2	2.1	7.7	1.9
2020	19.7	95.6	-0.1	4.1	-2.6	5.0	4.2	46.1	24.6	81.7	3.4	-12.2	2.3
2021	17.7	95.8	1.5	3.5	16.9	8.0	8.7	48.9	26.3	79.6	4.9	7.9	3.0
2021 Q4	17.7	95.8	0.8	3.5	15.8	8.0	8.7	48.9	26.3	79.6	4.9	14.2	3.0
2022 Q1	16.0	95.6	0.0	3.0	16.7	6.3	9.1	48.7	25.8	78.8	4.7	15.0	3.0
Q2	14.7	95.4	-0.4	2.7	16.2	3.5	8.7	48.6	24.4	77.5	4.7	-4.2	3.2
Q3	14.1	94.7	-0.4	2.6	10.6	2.1	7.6	48.6	23.7	77.6	4.7	30.8	3.5

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	1,224.1	1,212.8	11.2	684.3	676.6	294.4	256.0	209.2	208.6	36.1	71.7	28.0	20.2
Q2	1,274.1	1,313.3	-39.2	719.1	745.3	304.7	267.9	210.3	215.4	39.9	84.7	115.8	11.8
Q3	1,330.3	1,436.2	-105.9	753.3	808.8	312.1	318.3	224.5	223.4	40.4	85.8	19.9	16.7
Q4	1,337.2	1,309.2	28.0	761.0	747.6	306.3	261.6	232.7	222.4	37.2	77.6	43.3	30.4
2022 July	433.8	466.0	-32.2	243.4	263.6	103.3	100.0	73.9	73.5	13.3	29.0	7.2	5.4
Aug.	445.6	484.2	-38.6	253.3	277.1	103.9	104.1	74.7	73.4	13.7	29.5	5.2	5.2
Sep.	450.9	486.0	-35.1	256.6	268.1	105.0	114.2	75.9	76.5	13.5	27.3	7.4	6.1
Oct.	445.9	446.6	-0.7	256.0	258.7	103.2	90.2	74.7	73.1	12.0	24.7	5.0	3.3
Nov.	449.3	436.5	12.8	258.8	251.0	103.1	85.6	75.2	73.1	12.2	26.9	7.0	3.6
Dec.	442.0	426.1	15.9	246.2	238.0	99.9	85.9	82.8	76.2	13.1	26.0	31.3	23.5
12-month cumulated transactions													
2022 Dec.	5,165.7	5,271.6	-105.9	2,917.7	2,978.2	1,217.5	1,103.8	876.8	869.7	153.7	319.8	207.0	79.0
12-month cumulated transactions as a percentage of GDP													
2022 Dec.	38.8	39.6	-0.8	21.9	22.3	9.1	8.3	6.6	6.5	1.2	2.4	1.6	0.6

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.)				Memo item:	Imports (c.i.f.)					Memo items:	
			Total						Total					
	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	17.2	40.8	677.2	343.9	124.5	196.8	555.4	720.9	455.6	104.9	151.8		482.5	85.7
Q2	20.3	45.6	715.5	361.6	126.6	216.6	575.6	810.3	526.1	111.6	163.6		517.0	107.9
Q3	20.1	47.2	733.1	369.0	133.6	218.6	591.0	855.5	559.7	116.7	168.8		531.7	102.4
Q4	14.8	19.8	739.5	.	.	.	602.9	800.1	.	.	.		516.4	.
2022 July	13.0	43.5	237.1	119.6	43.0	70.8	189.4	276.8	182.7	36.8	54.2		172.0	37.0
Aug.	24.0	53.5	246.0	124.0	44.9	73.1	198.4	292.0	190.7	40.0	57.3		181.7	33.6
Sep.	23.6	45.0	250.0	125.5	45.8	74.6	203.2	286.7	186.3	39.9	57.3		178.0	31.9
Oct.	18.1	31.1	248.6	124.7	45.9	74.0	202.1	276.6	175.0	39.2	58.3		178.0	33.7
Nov.	17.2	20.4	251.2	124.2	47.7	74.5	204.9	265.6	168.8	38.3	56.4		173.9	32.4
Dec.	9.1	8.7	239.7	.	.	.	195.9	257.9	.	.	.		164.5	.
Volume indices (2000 = 100; annual percentage changes for columns 1 and 2)														
2022 Q1	2.5	10.1	107.0	108.0	104.5	111.0	107.1	116.9	117.7	119.8	115.7		119.6	130.6
Q2	2.8	10.9	107.8	107.2	102.5	117.9	106.9	121.3	123.3	125.0	119.7		123.1	143.9
Q3	2.8	13.9	106.2	105.2	105.9	113.1	105.6	122.6	125.0	124.5	119.5		122.4	138.6
Q4	.	.	.	.	.	.	.	.	.	.	.		.	.
2022 June	1.3	9.2	106.0	105.5	102.9	115.2	105.1	120.2	122.2	124.2	117.1		121.9	150.3
July	-3.7	8.5	103.4	103.4	103.1	109.8	101.6	119.8	121.9	118.6	116.7		120.5	141.3
Aug.	6.1	18.9	106.7	105.1	106.3	113.7	106.3	124.9	127.9	129.4	121.1		124.1	137.0
Sep.	6.3	14.4	108.6	107.2	108.2	115.6	108.8	123.2	125.3	125.4	120.7		122.6	137.5
Oct.	2.7	7.8	107.0	106.5	106.8	112.4	106.1	120.0	119.1	123.9	122.1		122.4	145.0
Nov.	2.5	2.2	108.0	105.5	112.4	112.8	108.0	117.3	116.3	120.4	121.0		120.4	136.6

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.

3.1 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 Q1	112.3	6.1	2.7	8.8	2.5	2.7	1.7	3.3	1.5	14.4	0.7	6.0	6.9
Q2	116.1	8.0	3.7	11.4	3.4	2.4	3.4	3.6	1.3	7.1	1.1	8.2	7.1
Q3	118.1	9.3	4.4	13.2	3.9	2.3	4.0	3.2	1.9	4.4	1.1	9.5	7.8
Q4	120.8	10.0	5.1	14.0	4.3	2.3	3.7	3.1	1.4	4.6	1.4	10.0	9.5
2022 Sep.	119.3	9.9	4.8	14.0	4.3	1.0	1.2	1.4	0.3	2.9	0.8	9.9	10.4
Oct.	121.0	10.6	5.0	15.1	4.3	1.4	1.2	1.9	0.5	6.2	0.4	10.6	11.1
Nov.	121.0	10.1	5.0	14.2	4.2	0.2	1.3	0.0	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	-0.4	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	0.4	0.8	0.6	0.3	8.7	8.2
Feb. [3)]	121.2	8.5	5.6	.	4.8	0.7	1.1	3.1	0.8	-1.1	0.6	.	.

	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 Q1	4.2	3.6	6.4	11.5	2.9	35.1	1.8	1.2	3.3	0.1	4.1	1.6
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
2022 Sep.	11.8	11.5	12.7	15.3	5.5	40.7	2.7	1.9	5.7	-0.3	7.3	2.5
Oct.	13.1	12.4	15.5	16.3	6.1	41.5	2.9	2.0	5.9	-0.7	7.3	2.7
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. [3)]	15.0	15.5	13.6	.	6.8	13.7	.	.	.	.	.	.

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]										Con-struction [2]	Residential property prices [3]	Experimental indicator of commercial property prices [3]
	Total (index: 2015 = 100)	Total		Industry excluding construction and energy						Energy			
			Manu-facturing	Total	Intermediate goods	Capital goods	Consumer goods						
							Total	Food, beverages and tobacco	Non-food				
	1	2	3	4	5	6	7	8	9	10	11	12	13
% of total in 2015	100.0	100.0	77.3	72.1	28.9	20.7	22.5	16.5	5.9	27.9			
2020	102.0	-2.6	-1.7	-0.1	-1.6	0.9	1.0	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	2.0	1.8	32.3	5.6	8.1	0.8
2022	153.9	34.3	16.9	14.1	20.3	7.2	12.1	.	7.7	85.2	11.5	.	.
2022 Q1	140.9	33.1	15.5	12.7	21.4	6.1	7.4	.	5.5	92.6	10.1	9.8	3.3
Q2	149.3	36.5	20.0	15.8	24.8	7.4	11.6	.	7.5	95.4	12.4	9.2	-0.1
Q3	163.2	41.2	17.7	14.7	20.2	7.8	14.0	.	8.6	107.9	11.9	6.8	.
Q4	162.0	27.3	14.6	13.1	15.5	7.6	15.3	.	9.3	56.0	11.8	.	.
2022 Aug.	165.0	43.5	17.5	14.6	20.0	7.8	14.1	.	8.6	117.3	-	-	-
Sep.	167.6	41.9	16.9	14.5	19.0	7.6	14.6	.	8.9	108.0	-	-	-
Oct.	162.5	30.5	16.2	14.0	17.5	7.6	15.4	.	9.3	64.8	-	-	-
Nov.	160.9	27.0	14.4	13.2	15.3	7.6	15.4	.	9.3	55.5	-	-	-
Dec.	162.7	24.6	13.1	12.3	13.7	7.5	15.1	.	9.4	48.6	-	-	-
2023 Jan.	158.1	15.0	11.6	11.1	11.3	7.3	14.8	.	8.8	20.3	-	-	-

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						Exports [1]	Imports [1]	Oil prices (EUR per barrel)	Non-energy commodity prices (EUR)					
	Total (s.a.; index: 2015 = 100)	Total	Domestic demand							Import-weighted [2]			Use-weighted [2]		
			Total	Private consump-tion	Govern-ment consump-tion	Gross fixed capital formation				Total	Food	Non-food	Total	Food	Non-food
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
% of total										100.0	45.4	54.6	100.0	50.4	49.6
2020	107.3	1.8	1.3	0.6	3.4	1.0	-1.4	-2.8	37.0	1.4	3.3	-0.3	-1.0	-0.3	-1.8
2021	109.5	2.0	2.8	2.2	1.5	3.7	5.8	7.9	59.8	29.5	21.3	37.2	28.8	21.7	37.1
2022	114.6	4.7	6.8	6.9	4.2	7.6	12.5	17.5	95.0	18.3	29.5	9.0	19.6	29.1	9.9
2022 Q1	112.4	3.7	5.8	4.9	2.8	7.3	11.8	17.1	88.7	32.2	35.0	29.7	35.5	38.5	32.5
Q2	113.7	4.5	6.9	6.4	3.7	8.4	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	7.5	4.6	7.4	13.5	19.6	98.3	14.8	30.8	1.5	15.5	28.6	2.3
Q4	117.4	5.8	7.1	8.8	5.7	7.4	9.7	12.6	86.6	5.6	14.6	-2.3	5.6	13.7	-3.1
2022 Sep.	-	-	-	-	-	-	-	-	91.0	16.5	31.4	3.7	15.9	28.1	3.2
Oct.	-	-	-	-	-	-	-	-	94.5	10.8	25.6	-1.7	12.8	27.4	-1.9
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	-4.3	1.0	-8.9	-5.3	-0.3	-10.4
Feb.	-	-	-	-	-	-	-	-	77.3	-7.6	-0.9	-13.4	-7.9	-1.6	-14.7

Sources: Eurostat, ECB calculations and Bloomberg (col. 9).
1) Deflators for exports and imports refer to goods and services and include cross-border trade within the euro area.
2) Import-weighted: weighted according to 2009-11 average import structure; use-weighted: weighted according to 2009-11 average domestic demand structure.

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 12 months	Input prices		Prices charged	
	Manu-facturing	Retail trade	Services	Construction		Manu-facturing	Services	Manu-facturing	Services
	1	2	3	4	5	6	7	8	9
1999-15	4.3	5.7	-	-4.4	32.4	56.7	56.3	-	49.7
2020	-0.4	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 Q1	51.5	49.6	23.8	39.0	60.0	84.2	74.2	72.9	59.8
Q2	55.9	56.3	28.4	48.7	71.7	84.0	78.0	74.8	64.4
Q3	45.8	53.8	27.3	40.7	76.5	74.3	74.9	67.1	61.8
Q4	40.5	52.0	29.3	41.8	78.1	65.8	74.3	63.7	62.0
2022 Sep.	48.4	54.0	28.3	42.1	76.4	76.5	77.4	67.4	63.2
Oct.	44.3	55.7	29.9	44.8	77.3	72.0	76.9	66.1	62.7
Nov.	39.7	51.0	29.7	43.1	78.4	64.5	74.3	63.6	62.3
Dec.	37.3	49.2	28.4	37.5	78.6	61.0	71.8	61.2	61.0
2023 Jan.	31.3	46.9	29.5	34.4	78.0	56.3	70.1	61.6	62.0
Feb.	23.8	45.0	27.2	26.2	78.6	50.9	71.0	58.4	61.8

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	1.3	0.9	1.2	1.4	1.5
2022	.	.	.	.	.	.	2.8
2022 Q1	108.5	3.7	2.7	7.3	4.3	2.6	2.9
Q2	119.2	3.8	3.2	6.0	3.9	3.5	2.5
Q3	112.4	2.8	2.1	5.3	2.5	3.6	2.9
Q4	.	.	.	.	.	.	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	-1.1	2.7	5.7	7.4	0.3	-0.2	1.4	4.0	6.2	16.0
2021	110.3	0.0	3.1	-3.1	2.8	-1.5	2.0	1.2	4.2	1.2	0.5	0.6
2022	113.9	3.3	4.2	2.8	5.2	1.5	3.0	4.0	5.3	4.3	3.7	-3.5
2022 Q1	112.5	2.0	3.3	3.7	3.1	-1.1	2.3	3.5	4.6	2.6	2.5	-5.5
Q2	112.7	2.9	5.5	3.2	5.0	1.1	1.8	4.6	4.9	4.1	3.2	-6.9
Q3	114.1	3.2	3.4	1.5	5.5	1.5	4.1	3.9	7.1	4.2	3.9	-1.0
Q4	116.4	4.7	4.6	2.3	7.0	4.4	3.8	3.9	4.8	6.1	5.3	-1.1
						Compensation per employee						
2020	107.2	-0.3	1.4	-2.0	-0.9	-3.9	0.4	0.3	0.6	0.3	2.3	-1.5
2021	111.4	3.9	3.2	4.3	4.5	5.8	4.4	3.1	5.0	4.1	1.9	3.4
2022	116.4	4.5	3.8	3.6	3.8	6.3	3.2	4.0	4.3	5.4	3.7	6.2
2022 Q1	114.5	4.4	3.4	4.4	4.3	7.7	2.9	3.9	5.3	4.6	2.7	8.1
Q2	115.3	4.6	3.8	4.2	3.5	7.8	2.6	4.7	4.7	5.7	2.8	6.9
Q3	116.8	3.9	3.5	2.6	3.1	4.6	3.2	4.0	4.6	5.0	3.6	5.4
Q4	118.8	5.1	4.4	3.5	4.4	5.6	4.0	3.3	2.8	6.4	5.8	4.6
						Labour productivity per person employed						
2020	97.2	-4.6	2.5	-4.5	-6.2	-10.6	0.1	0.5	-0.8	-3.5	-3.7	-15.0
2021	100.9	3.9	0.1	7.6	1.7	7.3	2.4	1.9	0.8	2.9	1.4	2.8
2022	102.1	1.2	-0.4	0.8	-1.4	4.7	0.1	0.0	-1.0	1.1	0.0	10.1
2022 Q1	101.8	2.4	0.1	0.7	1.1	8.9	0.6	0.4	0.7	1.9	0.2	14.3
Q2	102.3	1.6	-1.5	1.0	-1.4	6.7	0.9	0.1	-0.2	1.6	-0.4	14.8
Q3	102.4	0.7	0.1	1.1	-2.3	3.0	-0.9	0.1	-2.3	0.8	-0.2	6.5
Q4	102.1	0.3	-0.3	1.2	-2.4	1.2	0.1	-0.6	-1.9	0.3	0.5	5.8
						Compensation per hour worked						
2020	114.1	5.9	3.7	3.4	5.4	7.2	3.2	2.1	5.5	6.3	5.2	6.4
2021	114.4	0.3	1.2	-0.2	-0.3	0.1	1.8	1.4	0.7	0.3	0.7	-0.4
2022	118.2	3.4	4.5	3.8	4.0	1.9	3.6	4.5	3.3	4.2	4.6	2.6
2022 Q1	116.5	1.3	3.7	3.9	3.3	-2.4	2.8	4.2	2.8	2.1	3.3	-0.4
Q2	116.9	3.7	5.5	4.9	5.4	2.1	3.8	6.2	3.6	5.0	4.6	2.8
Q3	118.8	3.0	3.5	2.0	2.9	2.6	2.7	3.6	4.0	3.3	3.9	4.1
Q4	121.0	4.5	5.1	3.1	3.3	4.3	4.3	3.1	2.1	5.7	6.1	3.1
						Hourly labour productivity						
2020	104.8	2.1	3.3	1.2	0.8	0.9	3.7	2.9	5.4	2.9	-0.6	-6.4
2021	104.6	-0.1	-0.2	2.6	-3.6	1.0	-0.3	-0.1	-4.5	-1.4	-0.1	-1.7
2022	104.6	0.0	0.5	1.0	-1.5	0.7	0.3	0.5	-2.8	0.2	0.8	5.3
2022 Q1	104.3	-1.0	1.2	0.0	-0.1	-1.4	0.3	0.6	-3.1	-0.3	0.6	3.6
Q2	104.6	0.7	0.2	1.8	-0.8	1.7	1.7	1.8	-2.7	1.1	1.2	9.1
Q3	105.1	0.0	0.2	0.4	-2.5	1.8	-1.6	0.0	-3.3	-0.4	0.0	4.5
Q4	104.6	-0.3	-0.3	0.9	-3.2	-0.1	0.2	-1.1	-2.8	-0.6	0.6	3.6

Sources: Eurostat and ECB calculations.

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	0.10	0.36	0.69	1.11	2.40	-0.02
2022 Aug.	-0.08	0.02	0.39	0.84	1.25	2.95	-0.01
Sep.	0.36	0.57	1.01	1.60	2.23	3.45	-0.02
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	1.73	2.07	2.57	3.03	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	-

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 Aug.	-0.19	0.66	1.08	1.36	1.57	0.91	-0.33	0.00	1.36	1.53	1.65	1.84
Sep.	0.67	1.54	1.67	1.95	2.13	0.59	-0.20	0.53	1.84	1.84	2.30	2.32
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

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 Aug.	408.5	3,701.1	913.9	256.5	172.9	110.0	149.0	721.6	750.2	353.8	291.5	806.7	4,158.6	28,351.7
Sep.	382.4	3,466.2	857.4	237.7	163.2	104.7	149.3	660.3	670.9	335.8	274.9	746.8	3,850.5	27,419.0
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

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
	Overnight	Redeemable at notice of up to 3 months	With an agreed maturity of:				By initial period of rate fixation		APRC [3]		By initial period of rate fixation				APRC [3]	
			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 Feb.	0.01	0.45	0.18	0.56	4.81	15.78	5.29	5.27	5.87	2.09	1.36	1.49	1.39	1.38	1.66	1.38
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	5.87	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	6.15	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	5.74	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	6.67	5.91	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	2.89	2.67
Nov.	0.05	0.75	1.19	1.81	5.81	15.98	6.42	6.55	7.12	3.96	2.93	3.05	3.30	2.55	3.10	2.89
Dec.	0.07	0.80	1.41	1.91	5.95	15.90	6.65	6.42	7.00	3.99	3.07	3.17	3.29	2.61	3.18	2.94
2023 Jan. (p)	0.10	0.86	1.58	2.08	7.02	15.98	7.42	6.97	7.60	4.28	3.45	3.34	3.39	2.77	3.39	3.10

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
	Overnight	With an agreed maturity of:			up to EUR 0.25 million			over EUR 0.25 and up to 1 million			over EUR 1 million			
		Up to 2 years	Over 2 years		Floating rate and up to 3 months	Over 3 months and up to 1 year	Over 1 year	Floating rate and up to 3 months	Over 3 months and up to 1 year	Over 1 year	Floating rate and up to 3 months	Over 3 months and up to 1 year	Over 1 year	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2022 Feb.	-0.05	-0.32	0.41	1.67	1.77	1.93	2.08	1.50	1.43	1.42	1.07	1.07	1.46	1.42
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	2.31	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	2.76	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	3.38	3.07	2.88	3.31	3.30	3.11
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. (p)	0.23	1.99	2.71	3.58	4.13	4.20	4.39	3.77	3.91	3.45	3.41	3.74	3.39	3.63

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 Financial market developments

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 corpo-rations other than MFIs	FVCs	Non-financial corpo-rations		of which central govern-ment			Financial corpo-rations other than MFIs	FVCs	Non-financial corpo-rations		of which central govern-ment
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
							Short-term							
2020	1,493.2	429.8	129.1	54.4	96.4	838.0	724.3	.	.	.	.	.	.	.
2021	1,417.5	427.9	135.3	51.9	87.7	766.5	676.7	387.4	138.4	79.5	26.4	31.8	137.7	105.0
2022	1,357.9	463.4	137.9	50.0	88.3	668.2	623.3	481.4	182.2	117.3	48.0	47.8	134.0	97.3
2022 Sep.	1,371.9	447.8	148.2	52.9	102.3	673.5	607.0	558.4	218.7	134.0	56.8	65.5	140.2	104.3
Oct.	1,364.3	459.8	149.3	55.8	100.6	654.6	594.5	558.6	248.0	134.9	58.5	57.8	117.9	91.3
Nov.	1,403.2	482.8	144.2	52.5	96.5	679.6	630.4	610.7	266.3	142.8	63.3	49.0	152.6	132.1
Dec.	1,357.9	463.4	137.9	50.0	88.3	668.2	623.3	427.0	162.8	136.5	63.2	43.7	84.0	71.3
2023 Jan.	1,371.4	513.3	131.6	47.9	85.7	640.7	594.0	513.7	223.4	107.8	39.5	50.6	131.9	112.2
Feb.	1,342.5	521.2	130.7	43.5	80.3	610.3	568.3	476.7	219.8	94.2	30.0	42.1	120.4	95.6
							Long-term							
2020	19,430.2	4,076.4	3,225.0	1,270.8	1,547.2	10,581.5	9,794.5	.	.	.	.	.	.	.
2021	20,092.2	4,184.0	3,541.9	1,363.0	1,597.0	10,769.3	9,948.2	318.7	66.5	84.3	34.0	24.1	143.8	130.3
2022	18,124.3	3,971.6	3,498.5	1,359.7	1,384.4	9,269.8	8,557.8	302.9	78.6	77.1	29.0	16.4	130.7	121.3
2022 Sep.	18,204.1	4,005.4	3,446.8	1,342.8	1,368.4	9,383.4	8,652.7	325.5	94.7	74.6	27.6	19.4	136.8	126.7
Oct.	18,308.6	4,034.0	3,470.0	1,337.3	1,368.2	9,436.5	8,710.4	335.4	79.0	72.4	24.0	12.6	171.5	163.4
Nov.	18,679.4	4,089.9	3,535.5	1,355.4	1,413.1	9,640.8	8,902.7	336.0	78.8	100.4	39.8	23.4	133.4	119.8
Dec.	18,124.3	3,971.6	3,498.5	1,359.7	1,384.4	9,269.8	8,557.8	202.8	48.6	83.4	41.3	11.2	59.6	57.3
2023 Jan.	18,502.2	4,086.9	3,538.5	1,347.7	1,416.1	9,460.8	8,735.2	381.8	153.5	54.1	10.1	26.5	147.7	131.9
Feb.	18,412.0	4,079.4	3,545.9	1,346.5	1,403.4	9,383.4	8,659.9	366.3	98.5	71.3	33.9	17.7	178.8	161.7

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	20,923.4	4,506.2	3,354.1	1,325.2	1,643.6	11,419.5	10,518.8	8,528.0	478.2	1,304.2	6,744.6
2021	21,509.7	4,611.8	3,677.3	1,414.9	1,684.7	11,535.8	10,624.9	10,415.0	615.5	1,552.6	8,245.9
2022	19,482.1	4,435.0	3,636.6	1,409.7	1,472.8	9,938.0	9,181.1	8,776.7	540.6	1,353.0	6,882.6
2022 Sep.	19,576.0	4,453.3	3,595.0	1,395.7	1,470.7	10,056.9	9,259.6	7,972.4	466.7	1,207.9	6,297.1
Oct.	19,672.9	4,493.8	3,619.3	1,393.1	1,468.7	10,091.1	9,304.9	8,528.7	512.9	1,267.2	6,747.9
Nov.	20,082.5	4,572.8	3,679.8	1,407.9	1,509.6	10,320.4	9,533.0	9,112.2	546.1	1,375.9	7,189.6
Dec.	19,482.1	4,435.0	3,636.3	1,409.7	1,472.8	9,938.0	9,181.1	8,776.7	540.6	1,353.0	6,882.6
2023 Jan.	19,873.7	4,600.2	3,670.1	1,395.6	1,501.8	10,101.5	9,329.2	9,498.2	608.8	1,460.5	7,428.4
Feb.	19,754.5	4,600.6	3,676.6	1,389.9	1,483.6	9,993.6	9,228.1	9,659.5	640.1	1,484.5	7,534.3
					Growth rate [1]						
2022 July	3.8	3.2	8.5	6.9	2.8	2.7	3.2	0.9	-0.4	3.2	0.6
Aug.	3.9	3.3	8.6	5.8	3.2	2.7	3.1	0.8	-0.7	2.7	0.5
Sep.	3.6	3.9	7.2	3.2	2.4	2.4	2.8	0.4	-0.9	2.4	0.1
Oct.	3.6	4.7	5.1	0.8	1.5	2.9	3.3	0.4	-1.1	2.4	0.2
Nov.	4.1	5.5	6.5	1.8	0.5	3.2	3.8	0.2	-1.3	1.8	0.0
Dec.	3.9	4.9	5.8	0.3	1.0	3.2	3.8	0.2	-1.6	1.4	0.2
2023 Jan.	4.2	7.3	5.0	-0.1	0.8	3.1	3.7	0.2	-2.0	1.0	0.2
Feb.	4.3	7.8	4.8	0.4	0.8	3.2	3.8	0.3	-2.2	1.2	0.3

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	88.7	71.3	86.2	120.9	94.3
2022	95.5	90.7	93.1	.	.	.	116.8	90.8
2022 Q1	96.5	91.4	92.6	84.7	69.2	82.8	118.8	92.5
Q2	95.6	90.3	93.1	83.2	67.1	81.3	116.5	90.2
Q3	94.0	89.2	92.2	81.8	64.8	80.0	114.5	88.9
Q4	95.9	91.7	94.6	.	.	.	117.3	91.6
2022 Sep.	94.2	89.8	92.8	-	-	-	114.6	89.3
Oct.	94.8	91.1	93.8	-	-	-	115.5	90.6
Nov.	96.0	91.9	94.7	-	-	-	117.2	91.7
Dec.	97.0	92.3	95.2	-	-	-	119.2	92.6
2023 Jan.	97.3	92.5	94.5	-	-	-	119.9	93.0
Feb.	97.3	92.5	94.1	-	-	-	120.1	93.0
	Percentage change versus previous month							
2023 Feb.	0.0	0.0	-0.5	-	-	-	0.1	0.0
	Percentage change versus previous year							
2023 Feb.	0.4	1.0	1.6	-	-	-	0.8	0.4

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 Q1	7.121	24.653	7.441	364.600	130.464	4.623	0.836	4.9465	10.481	1.036	1.122
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
2022 Sep.	6.951	24.576	7.437	404.186	141.568	4.741	0.875	4.9097	10.784	0.964	0.990
Oct.	7.069	24.528	7.439	418.308	144.725	4.804	0.871	4.9259	10.950	0.979	0.983
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
	Percentage change versus previous month										
2023 Feb.	0.1	-1.0	0.1	-2.8	1.3	0.9	0.4	-0.3	-0.3	-0.6	-0.5
	Percentage change versus previous year										
2023 Feb.	1.8	-3.0	0.1	7.8	9.0	4.2	5.7	-0.8	6.1	-5.3	-5.5

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)								
2021 Q4	32,244.0	32,189.2	54.7	11,944.4	9,753.9	12,864.4	14,684.3	-98.5	6,476.6	7,751.0	1,057.0	15,909.5
2022 Q1	32,253.5	32,035.3	218.1	12,017.8	9,926.0	12,337.4	14,002.7	-57.3	6,852.8	8,106.7	1,102.8	16,357.4
Q2	32,032.2	31,599.1	433.1	12,383.0	10,169.1	11,511.6	13,107.0	-19.6	7,035.1	8,323.0	1,122.1	16,454.9
Q3	32,162.4	31,683.1	479.4	12,698.9	10,477.4	11,188.0	12,790.6	-8.0	7,147.8	8,415.1	1,135.8	16,582.8
				Outstanding amounts as a percentage of GDP								
2022 Q3	245.6	242.0	3.7	97.0	80.0	85.4	97.7	-0.1	54.6	64.3	8.7	126.6
				Transactions								
2022 Q1	371.0	377.5	-6.5	56.6	42.4	-18.0	30.4	-1.6	334.8	304.8	-0.9	-
Q2	-32.5	-57.2	24.7	64.4	-47.9	-127.4	-86.2	28.9	-0.7	76.8	2.3	-
Q3	2.6	52.8	-50.2	68.7	86.7	-184.4	-6.0	44.1	66.8	-27.9	7.4	-
Q4	-409.1	-463.0	53.9	-221.8	-254.8	85.9	59.9	-2.0	-280.1	-268.0	8.9	-
2022 July	87.8	80.0	7.8	22.3	35.2	-33.9	-70.4	11.6	86.1	115.2	1.6	-
Aug.	125.2	133.2	-8.0	44.9	74.9	-32.3	28.6	14.9	95.6	29.7	2.2	-
Sep.	-210.3	-160.4	-50.0	1.5	-23.4	-118.2	35.8	17.6	-114.9	-172.8	3.6	-
Oct.	125.2	111.7	13.6	4.8	-2.6	-10.4	37.1	7.2	119.9	77.3	3.8	-
Nov.	9.8	31.8	-22.0	20.3	16.0	44.7	61.5	3.5	-59.3	-45.7	0.5	-
Dec.	-544.1	-606.4	62.4	-246.9	-268.2	51.6	-38.7	-12.7	-340.7	-299.6	4.6	-
				12-month cumulated transactions								
2022 Dec.	-67.9	-89.9	22.0	-32.0	-173.6	-243.9	-1.9	69.5	120.9	85.7	17.7	-
				12-month cumulated transactions as a percentage of GDP								
2022 Dec.	-0.5	-0.7	0.2	-0.2	-1.3	-1.8	0.0	0.5	0.9	0.6	0.1	-

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

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	733.2	14,449.3
2021	1,469.7	9,784.0	11,253.8	916.1	2,506.4	3,422.5	14,676.2	118.0	647.5	21.7	787.2	15,463.4
2022	1,538.5	9,788.7	11,327.2	1,377.7	2,566.6	3,944.3	15,271.5	123.3	649.9	47.0	820.3	16,091.7
2022 Q1	1,520.4	9,918.2	11,438.6	936.6	2,520.4	3,457.0	14,895.6	123.2	591.2	44.7	759.1	15,654.7
Q2	1,528.0	10,048.6	11,576.6	972.9	2,530.6	3,503.5	15,080.1	115.9	609.1	64.6	789.7	15,869.8
Q3	1,538.2	10,177.5	11,715.7	1,175.8	2,552.7	3,728.4	15,444.1	120.4	598.0	48.9	767.4	16,211.5
Q4	1,538.5	9,788.7	11,327.2	1,377.7	2,566.6	3,944.3	15,271.5	123.3	649.9	47.0	820.3	16,091.7
2022 Aug.	1,536.4	10,184.2	11,720.6	1,031.8	2,547.7	3,579.5	15,300.1	123.7	595.5	38.4	757.7	16,057.8
Sep.	1,538.2	10,177.5	11,715.7	1,175.8	2,552.7	3,728.4	15,444.1	120.4	598.0	48.9	767.4	16,211.5
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	9,788.7	11,327.2	1,377.7	2,566.6	3,944.3	15,271.5	123.3	649.9	47.0	820.3	16,091.7
2023 Jan. (p)	1,540.6	9,741.7	11,282.3	1,457.3	2,560.4	4,017.6	15,299.9	133.8	637.1	51.5	822.5	16,122.4
						Transactions						
2020	139.2	1,243.9	1,383.2	-33.8	86.3	52.5	1,435.7	19.6	111.0	1.3	131.9	1,567.6
2021	107.4	898.7	1,006.1	-121.6	66.7	-55.0	951.1	12.1	21.2	14.5	47.8	998.8
2022	68.8	-4.5	64.3	427.2	56.7	484.0	548.3	3.7	2.8	77.8	84.3	632.6
2022 Q1	50.7	127.1	177.8	23.8	10.5	34.3	212.1	4.9	-56.2	23.0	-28.3	183.8
Q2	7.6	111.3	118.8	30.6	10.5	41.1	159.9	-8.6	18.0	16.9	26.3	186.3
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	-360.8	-360.5	212.4	13.9	226.3	-134.2	4.8	52.0	-0.8	55.9	-78.3
2022 Aug.	4.7	85.4	90.1	27.9	8.9	36.8	126.9	-1.8	1.9	10.9	11.0	137.9
Sep.	1.8	-13.3	-11.4	106.8	4.9	111.7	100.3	-3.8	2.5	13.4	12.1	112.4
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	-25.4	14.6	16.2	16.7	47.6	22.1
Dec.	-2.8	-110.3	-113.1	53.1	15.3	68.3	-44.7	-14.8	11.1	10.5	6.8	-38.0
2023 Jan. (p)	0.8	-89.9	-89.2	74.1	-6.2	67.9	-21.3	9.9	-12.8	4.0	1.1	-20.2
						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	3.4	367.7	6.5	6.9
2022	4.7	0.0	0.6	45.7	2.3	14.0	3.7	3.0	0.4	521.9	11.3	4.1
2022 Q1	9.4	8.7	8.8	-5.7	2.0	-0.2	6.6	9.4	-3.9	70.9	0.6	6.3
Q2	7.8	7.1	7.2	2.5	1.8	2.0	6.0	-2.6	-1.1	95.3	2.6	5.8
Q3	6.5	5.5	5.6	23.6	2.3	8.0	6.2	-4.5	-1.3	361.9	7.7	6.3
Q4	4.7	0.0	0.6	45.7	2.3	14.0	3.7	3.0	0.4	521.9	11.3	4.1
2022 Aug.	7.1	6.7	6.8	10.9	2.3	4.6	6.3	3.6	-4.8	190.6	3.4	6.1
Sep.	6.5	5.5	5.6	23.6	2.3	8.0	6.2	-4.5	-1.3	361.9	7.7	6.3
Oct.	6.0	3.4	3.8	30.2	2.3	9.9	5.2	-7.9	-0.3	67.1	3.5	5.1
Nov.	5.4	1.9	2.4	38.6	1.9	12.0	4.6	8.2	-0.9	241.1	8.4	4.8
Dec.	4.7	0.0	0.6	45.7	2.3	14.0	3.7	3.0	0.4	521.9	11.3	4.1
2023 Jan. (p)	3.8	-1.3	-0.7	49.5	1.9	15.1	3.0	2.6	5.6	243.2	13.3	3.5

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

5 Financing conditions and credit developments

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	2,968.8	2,517.0	308.2	140.2	3.3	7,665.2	4,967.3	437.0	2,260.1	0.9	1,087.6	235.3	497.3
2021	3,234.7	2,810.2	288.9	128.7	6.9	8,090.5	5,383.9	372.5	2,333.4	0.7	1,225.3	227.8	546.3
2022	3,367.8	2,731.1	495.9	135.0	5.9	8,392.2	5,555.3	442.8	2,393.3	0.9	1,301.3	235.0	560.0
2022 Q1	3,268.9	2,839.7	289.1	129.8	10.3	8,188.1	5,478.3	358.0	2,350.8	1.0	1,256.1	231.7	553.5
Q2	3,303.5	2,857.6	304.4	130.7	10.8	8,253.3	5,538.1	354.0	2,360.5	0.7	1,309.6	231.3	570.3
Q3	3,382.6	2,852.2	388.3	133.4	8.8	8,372.0	5,620.1	370.0	2,380.9	1.0	1,476.0	243.9	551.9
Q4	3,367.8	2,731.1	495.9	135.0	5.9	8,392.2	5,555.3	442.8	2,393.3	0.9	1,301.3	235.0	560.0
2022 Aug.	3,387.4	2,899.2	347.4	132.6	8.2	8,331.2	5,596.6	357.0	2,376.7	0.8	1,364.7	237.5	566.5
Sep.	3,382.6	2,852.2	388.3	133.4	8.8	8,372.0	5,620.1	370.0	2,380.9	1.0	1,476.0	243.9	551.9
Oct.	3,408.7	2,821.4	446.3	131.7	9.3	8,385.4	5,613.9	384.9	2,385.6	1.1	1,351.2	255.0	557.1
Nov.	3,396.1	2,768.0	488.3	131.8	8.1	8,379.1	5,582.2	413.4	2,382.5	1.0	1,342.7	250.5	557.7
Dec.	3,367.8	2,731.1	495.9	135.0	5.9	8,392.2	5,555.3	442.8	2,393.3	0.9	1,301.3	235.0	560.0
2023 Jan. (p)	3,375.3	2,697.3	536.3	134.2	7.4	8,438.8	5,564.2	484.9	2,389.0	0.8	1,281.6	237.0	560.4
Transactions													
2020	511.7	466.2	55.3	-6.8	-3.0	612.8	561.7	-53.8	105.0	0.0	137.8	20.6	33.1
2021	252.0	277.0	-21.4	-6.9	3.3	424.5	412.7	-65.1	77.0	-0.2	142.2	-9.5	46.6
2022	121.8	-88.3	205.6	5.9	-1.4	296.2	167.1	74.1	54.9	0.1	42.9	7.6	14.7
2022 Q1	28.4	24.5	-0.3	0.9	3.3	95.3	93.2	-10.6	12.4	0.3	30.2	4.1	8.2
Q2	22.3	8.7	12.5	0.8	0.2	62.8	57.8	-4.8	10.1	-0.3	42.7	-0.6	16.5
Q3	68.8	-11.9	80.4	2.7	-2.3	113.2	77.4	15.2	20.3	0.3	127.9	11.4	-18.5
Q4	2.3	-109.6	112.9	1.6	-2.6	24.9	-61.4	74.3	12.1	-0.1	-158.0	-7.4	8.4
2022 Aug.	54.1	29.0	24.8	2.1	-1.7	35.3	24.9	2.8	7.5	0.1	36.0	-3.5	-1.4
Sep.	-8.8	-49.8	39.7	0.8	0.5	39.6	22.7	12.6	4.1	0.1	72.5	6.1	-14.7
Oct.	29.5	-28.7	59.2	-1.6	0.6	14.4	-5.2	15.2	4.4	0.1	-122.7	11.3	5.3
Nov.	-4.8	-48.2	44.4	0.1	-1.1	-4.0	-30.2	29.2	-3.0	0.0	1.1	-3.9	0.7
Dec.	-22.4	-32.8	9.3	3.1	-2.1	14.5	-26.0	29.9	10.8	-0.2	-36.4	-14.9	2.4
2023 Jan. (p)	-5.2	-46.3	40.2	-0.7	1.6	12.8	-19.6	36.8	-4.3	-0.1	-19.9	1.0	-0.8
Growth rates													
2020	20.6	22.5	21.5	-4.5	-46.6	8.7	12.8	-10.9	4.9	-5.4	13.8	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	-3.1	70.0	4.6	-17.2	3.7	3.1	20.0	2.4	20.0	3.7	3.4	2.7
2022 Q1	6.9	8.7	-5.0	-4.2	39.8	4.6	7.1	-14.3	2.6	26.1	13.5	5.7	12.8
Q2	6.0	6.7	2.5	-1.2	22.5	4.1	6.2	-12.5	2.3	-15.0	12.2	2.7	16.0
Q3	5.9	3.3	34.0	1.8	-15.2	4.2	5.6	-4.2	2.6	55.7	18.1	7.2	6.5
Q4	3.7	-3.1	70.0	4.6	-17.2	3.7	3.1	20.0	2.4	20.0	3.7	3.4	2.7
2022 Aug.	7.2	6.3	19.4	1.3	-18.5	4.2	5.8	-8.9	2.7	6.7	14.7	3.9	12.5
Sep.	5.9	3.3	34.0	1.8	-15.2	4.2	5.6	-4.2	2.6	55.7	18.1	7.2	6.5
Oct.	6.0	1.5	50.9	1.8	2.6	4.1	5.0	1.2	2.5	7.6	6.8	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	6.5	8.7	6.9
Dec.	3.7	-3.1	70.0	4.6	-17.2	3.7	3.1	20.0	2.4	20.0	3.7	3.4	2.7
2023 Jan. (p)	3.3	-4.8	81.9	3.8	-28.1	3.3	2.0	31.6	1.9	-3.1	0.1	-0.1	3.7

Source: ECB.
1) Data refer to the changing composition of the euro area.
2) In accordance with the ESA 2010, in December 2014 holding companies of non-financial groups were reclassified from the non-financial corporations sector to the financial corporations sector. These entities are included in MFI balance sheet statistics with financial corporations other than MFIs and insurance corporations and pension funds (ICPFs).
3) Including non-profit institutions serving households.
4) 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 corporations [3]	To households [4]	To financial corporations other than MFIs and ICPFs [3]	To insurance corporations and pension funds		
						Adjusted loans [2]						
	1	2	3	4	5	6	7	8	9	10	11	12
						Outstanding amounts						
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	14,802.6	12,332.2	12,716.4	4,861.4	6,373.6	937.4	159.7	1,582.3	888.1
2022	6,374.1	1,007.4	5,341.6	15,387.8	12,981.6	13,154.9	5,128.7	6,633.3	1,073.2	146.5	1,569.9	836.3
2022 Q1	6,551.0	1,001.6	5,546.6	15,018.2	12,561.3	12,699.1	4,915.8	6,472.1	1,020.0	153.3	1,587.9	869.0
Q2	6,503.0	1,000.6	5,478.2	15,181.8	12,789.6	12,927.7	5,020.2	6,552.7	1,053.1	163.6	1,561.3	830.9
Q3	6,359.6	1,002.3	5,333.0	15,420.7	13,050.1	13,185.0	5,165.7	6,612.6	1,110.6	161.2	1,546.0	824.6
Q4	6,374.1	1,007.4	5,341.6	15,387.8	12,981.6	13,154.9	5,128.7	6,633.3	1,073.2	146.5	1,569.9	836.3
2022 Aug.	6,426.8	998.3	5,404.3	15,321.6	12,942.6	13,074.4	5,133.4	6,595.1	1,061.1	153.0	1,548.9	830.1
Sep.	6,359.6	1,002.3	5,333.0	15,420.7	13,050.1	13,185.0	5,165.7	6,612.6	1,110.6	161.2	1,546.0	824.6
Oct.	6,378.8	996.3	5,358.1	15,410.9	13,039.8	13,173.4	5,187.8	6,621.5	1,071.0	159.5	1,537.2	833.8
Nov.	6,423.3	994.6	5,403.7	15,440.6	13,042.1	13,192.3	5,164.7	6,631.3	1,096.4	149.7	1,561.1	837.4
Dec.	6,374.1	1,007.4	5,341.6	15,387.8	12,981.6	13,154.9	5,128.7	6,633.3	1,073.2	146.5	1,569.9	836.3
2023 Jan. (p)	6,378.8	993.5	5,360.4	15,422.9	13,031.2	13,203.2	5,143.7	6,655.8	1,085.0	146.8	1,555.0	836.6
						Transactions						
2020	1,039.9	13.5	1,026.3	733.4	534.7	555.5	287.6	209.3	20.7	17.1	170.6	28.2
2021	665.7	-0.4	675.7	561.9	473.9	507.3	176.0	261.8	46.2	-10.2	78.8	9.2
2022	177.8	9.9	166.9	633.6	622.1	670.7	270.0	241.4	123.7	-13.0	17.9	-6.4
2022 Q1	100.6	4.5	96.1	196.8	192.0	186.1	46.0	71.6	80.3	-5.9	18.6	-13.7
Q2	68.6	-0.9	69.5	211.3	230.1	238.7	100.6	84.4	34.8	10.3	-13.9	-4.8
Q3	-36.6	2.1	-38.9	222.2	232.1	236.3	139.2	58.2	38.0	-3.2	-9.4	-0.5
Q4	45.1	4.2	40.2	3.2	-32.0	9.7	-15.8	27.3	-29.4	-14.2	22.6	12.6
2022 Aug.	-27.0	0.8	-27.7	85.7	92.9	93.1	63.9	19.4	16.7	-7.0	-8.4	1.1
Sep.	5.7	3.9	1.6	83.6	79.3	83.8	30.1	17.7	23.4	8.1	4.2	0.1
Oct.	11.8	-5.9	17.8	-4.8	-3.2	-1.9	25.6	10.2	-37.5	-1.6	-9.7	8.2
Nov.	7.7	-2.0	9.0	38.5	17.1	33.0	-16.2	13.1	29.8	-9.5	19.5	1.9
Dec.	25.6	12.1	13.4	-30.6	-45.9	-21.4	-25.1	4.0	-21.6	-3.1	12.8	2.6
2023 Jan. (p)	-58.3	-20.4	-37.7	-2.9	16.3	10.9	2.2	1.9	11.8	0.4	-18.4	-0.8
						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	3.8	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	13.2	-7.9	1.2	-0.6
2022 Q1	10.1	0.8	11.9	4.2	4.3	4.6	3.5	4.4	8.7	-1.2	6.6	-1.6
Q2	8.4	-0.2	10.1	5.2	5.9	6.2	5.9	4.6	13.8	7.8	5.0	-2.7
Q3	5.0	0.5	5.8	5.7	6.7	7.0	7.9	4.4	15.0	10.0	3.5	-3.0
Q4	2.8	1.0	3.1	4.3	5.0	5.4	5.5	3.8	13.2	-7.9	1.2	-0.6
2022 Aug.	5.6	-0.4	6.7	5.6	6.4	6.8	7.8	4.4	14.0	-0.7	3.7	-3.0
Sep.	5.0	0.5	5.8	5.7	6.7	7.0	7.9	4.4	15.0	10.0	3.5	-3.0
Oct.	4.6	0.9	5.3	5.2	6.2	6.5	8.1	4.1	11.4	3.1	0.9	-1.7
Nov.	3.7	0.4	4.3	5.1	5.8	6.2	7.3	4.0	12.3	-6.4	2.8	-0.9
Dec.	2.8	1.0	3.1	4.3	5.0	5.4	5.5	3.8	13.2	-7.9	1.2	-0.6
2023 Jan. (p)	1.4	-0.8	1.8	3.8	4.5	4.9	5.4	3.4	10.3	-12.7	0.8	-0.6

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	4,861.4	4,993.3	885.1	1,005.8	2,970.5	6,373.6	6,638.4	698.5	4,971.1	704.0
2022	5,128.7	5,120.8	963.3	1,081.3	3,084.2	6,633.3	6,828.6	717.6	5,215.0	700.7
2022 Q1	4,915.8	4,890.2	909.6	1,003.1	3,003.2	6,472.1	6,672.1	701.5	5,063.2	707.4
Q2	5,020.2	4,995.6	949.8	1,028.1	3,042.2	6,552.7	6,742.3	709.0	5,138.6	705.1
Q3	5,165.7	5,136.5	1,008.1	1,068.1	3,089.5	6,612.6	6,801.3	714.0	5,194.4	704.2
Q4	5,128.7	5,120.8	963.3	1,081.3	3,084.2	6,633.3	6,828.6	717.6	5,215.0	700.7
2022 Aug.	5,133.4	5,099.0	988.5	1,063.0	3,081.9	6,595.1	6,784.1	711.5	5,178.7	704.9
Sep.	5,165.7	5,136.5	1,008.1	1,068.1	3,089.5	6,612.6	6,801.3	714.0	5,194.4	704.2
Oct.	5,187.8	5,154.1	1,006.4	1,077.6	3,103.8	6,621.5	6,812.0	715.5	5,202.0	704.0
Nov.	5,164.7	5,144.7	993.0	1,073.0	3,098.7	6,631.3	6,825.5	716.9	5,210.4	704.0
Dec.	5,128.7	5,120.8	963.3	1,081.3	3,084.2	6,633.3	6,828.6	717.6	5,215.0	700.7
2023 Jan. (p)	5,143.7	5,137.3	958.5	1,086.1	3,099.0	6,655.8	6,860.2	720.3	5,226.8	708.7
Transactions										
2020	287.6	324.9	-53.5	138.5	202.6	209.3	193.7	-11.6	210.8	10.2
2021	176.0	208.2	-1.5	2.7	174.9	261.8	267.2	10.7	255.0	-3.8
2022	270.0	307.0	78.6	79.2	112.2	241.4	249.3	22.6	217.8	1.0
2022 Q1	46.0	53.2	20.9	-3.2	28.4	71.6	80.3	5.1	65.0	1.4
Q2	100.6	106.4	40.5	22.4	37.7	84.4	74.1	7.4	75.7	1.2
Q3	139.2	139.5	55.4	39.9	43.8	58.2	58.9	4.9	55.0	-1.8
Q4	-15.8	7.8	-38.2	20.1	2.3	27.3	36.0	5.2	22.0	0.1
2022 Aug.	63.9	58.8	26.7	21.7	15.5	19.4	22.0	0.0	19.1	0.3
Sep.	30.1	36.5	17.6	4.9	7.7	17.7	17.5	2.8	15.2	-0.3
Oct.	25.6	24.2	-0.5	10.6	15.5	10.2	11.9	1.5	8.3	0.3
Nov.	-16.2	-4.1	-12.8	-0.8	-2.6	13.1	18.1	2.2	9.1	1.8
Dec.	-25.1	-12.3	-24.9	10.3	-10.6	4.0	6.0	1.5	4.6	-2.0
2023 Jan. (p)	2.2	0.1	-5.4	1.5	6.1	1.9	10.5	0.3	2.8	-1.3
Growth rates										
2020	6.4	7.1	-5.6	15.9	7.7	3.5	3.1	-1.6	4.7	1.5
2021	3.8	4.3	-0.2	0.3	6.2	4.3	4.2	1.5	5.4	-0.5
2022	5.5	6.3	8.8	7.9	3.8	3.8	3.8	3.2	4.4	0.1
2022 Q1	3.5	4.2	2.4	-0.8	5.4	4.4	4.5	2.6	5.4	-0.2
Q2	5.9	6.9	14.1	5.9	3.6	4.6	4.6	3.4	5.4	0.0
Q3	7.9	8.9	19.6	9.9	4.0	4.4	4.4	3.5	5.1	0.0
Q4	5.5	6.3	8.8	7.9	3.8	3.8	3.8	3.2	4.4	0.1
2022 Aug.	7.8	8.7	18.8	9.7	4.1	4.4	4.5	3.3	5.2	-0.1
Sep.	7.9	8.9	19.6	9.9	4.0	4.4	4.4	3.5	5.1	0.0
Oct.	8.1	8.9	16.9	11.0	4.6	4.1	4.2	3.3	4.8	0.0
Nov.	7.3	8.3	14.1	10.0	4.4	4.0	4.1	3.0	4.6	0.3
Dec.	5.5	6.3	8.8	7.9	3.8	3.8	3.8	3.2	4.4	0.1
2023 Jan. (p)	5.4	6.1	8.0	8.6	3.6	3.4	3.6	3.1	3.9	0.0

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

5.5 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	6,883.7	1,837.3	37.1	1,997.3	3,011.9	1,372.6	391.9	128.5	136.8
2022	683.7	6,744.6	1,780.8	31.0	2,112.3	2,820.6	1,334.1	424.0	137.8	147.6
2022 Q1	740.2	6,881.7	1,848.2	34.8	1,988.7	3,010.0	1,361.1	346.4	160.7	164.4
Q2	757.5	6,800.4	1,843.9	30.6	2,008.5	2,917.3	1,313.6	429.3	166.5	157.3
Q3	642.5	6,781.8	1,801.9	30.6	2,096.5	2,852.9	1,318.9	536.5	148.0	146.7
Q4	683.7	6,744.6	1,780.8	31.0	2,112.3	2,820.6	1,334.1	424.0	137.8	147.6
2022 Aug.	649.5	6,826.2	1,813.2	31.0	2,080.4	2,901.6	1,362.0	423.0	157.4	145.7
Sep.	642.5	6,781.8	1,801.9	30.6	2,096.5	2,852.9	1,318.9	536.5	148.0	146.7
Oct.	676.5	6,745.4	1,789.4	30.8	2,101.2	2,824.0	1,283.8	489.3	144.4	156.1
Nov.	692.4	6,792.6	1,788.3	30.9	2,109.5	2,863.9	1,316.2	449.5	161.2	170.6
Dec.	683.7	6,744.6	1,780.8	31.0	2,112.3	2,820.6	1,334.1	424.0	137.8	147.6
2023 Jan. (p)	564.7	6,848.2	1,784.6	32.5	2,147.2	2,883.9	1,344.3	389.2	155.5	157.0
Transactions										
2020	299.6	-35.8	-15.1	-8.0	-101.0	88.3	-59.6	117.6	-43.6	-47.5
2021	40.0	-37.1	-75.1	-5.0	-39.7	82.7	-115.8	-110.0	-8.3	-4.3
2022	-75.8	49.7	-89.8	-5.2	14.1	130.6	-66.6	-138.3	10.5	17.9
2022 Q1	-19.0	-28.8	-19.5	-1.3	-25.0	17.0	-31.5	-129.9	32.0	34.7
Q2	17.2	20.2	-8.0	-4.2	-16.0	48.3	-60.8	4.4	7.2	-7.1
Q3	-115.0	-4.2	-47.1	0.0	-2.2	45.1	-26.2	62.1	-18.6	-10.6
Q4	41.0	62.5	-15.2	0.3	57.3	20.1	51.9	-74.9	-10.2	1.0
2022 Aug.	-91.7	-8.7	-20.6	0.8	4.6	6.6	30.6	-51.8	-16.0	-14.0
Sep.	-7.1	6.7	-13.8	-0.3	-1.6	22.5	-52.4	75.1	-9.5	1.0
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	9.5	16.9	14.5
Dec.	-8.4	35.7	-5.4	0.1	11.6	29.3	24.5	-30.2	-23.4	-22.9
2023 Jan. (p)	-125.1	43.6	0.4	1.6	44.5	-2.8	-6.9	-33.5	17.7	9.4
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	0.7	-4.8	-14.3	0.5	4.5	-	-	7.9	12.7
2022 Q1	5.8	-0.7	-4.0	-13.2	-2.0	2.3	-	-	19.6	30.3
Q2	12.2	0.0	-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	0.7	-4.8	-14.3	0.5	4.5	-	-	7.9	12.7
2022 Aug.	-8.2	-0.1	-4.1	-18.4	-1.7	3.8	-	-	25.0	18.0
Sep.	-7.4	-0.1	-4.8	-18.6	-2.0	4.4	-	-	4.4	4.2
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	0.7	-4.8	-14.3	0.5	4.5	-	-	7.9	12.7
2023 Jan. (p)	-23.0	1.5	-4.3	-8.9	2.7	4.3	-	-	-7.2	-1.8

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
2018	-0.4	-1.0	0.1	0.2	0.3	1.4
2019	-0.6	-1.0	0.1	0.1	0.3	1.0
2020	-7.0	-5.8	-0.4	0.0	-0.9	-5.5
2021	-5.1	-5.1	-0.1	0.1	-0.1	-3.7
2021 Q4	-5.1	.	.	.	.	-3.7
2022 Q1	-4.0	.	.	.	.	-2.5
Q2	-2.8	.	.	.	.	-1.3
Q3	-2.6	.	.	.	.	-1.0

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

6.2 Revenue and expenditure
(as a percentage of GDP; flows during one-year period)

	Revenue						Expenditure						
	Total	Current revenue				Capital revenue	Total	Current expenditure					Capital expenditure
		Total	Direct taxes	Indirect taxes	Net social contributions			Total	Compen- sation of employees	Intermediate consumption	Interest	Social benefits	
	1	2	3	4	5	6	7	8	9	10	11	12	13
2018	46.5	46.0	12.9	13.0	15.2	0.5	46.9	43.2	9.9	5.3	1.8	22.3	3.7
2019	46.3	45.8	12.9	13.0	15.0	0.5	46.9	43.2	9.9	5.4	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	4.5
2021	47.2	46.5	13.3	13.1	15.3	0.7	52.3	47.5	10.2	6.0	1.5	24.2	4.8
2021 Q4	47.2	46.5	13.3	13.1	15.3	0.7	52.3	47.5	10.2	6.0	1.5	24.2	4.8
2022 Q1	47.2	46.5	13.3	13.2	15.2	0.7	51.2	46.4	10.1	5.9	1.5	23.7	4.7
Q2	47.4	46.7	13.6	13.2	15.1	0.7	50.3	45.6	10.0	5.9	1.5	23.3	4.6
Q3	47.5	46.8	13.7	13.2	15.0	0.7	50.1	45.6	9.9	5.8	1.6	23.2	4.6

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

6.3 Government debt-to-GDP ratio
(as a percentage of GDP; outstanding amounts at end of period)

	Total	Financial instrument			Holder			Original maturity		Residual maturity			Currency	
		Currency and deposits	Loans	Debt securities	Resident creditors	MFIs	Non-resident creditors	Up to 1 year	Over 1 year	Up to 1 year	Over 1 and up to 5 years	Over 5 years	Euro or participating currencies	Other curren- cies
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2018	86.0	3.1	13.8	69.0	48.3	32.6	37.6	8.2	77.8	16.1	28.3	41.5	84.5	1.5
2019	83.9	3.0	13.0	67.9	45.5	30.7	38.4	7.7	76.2	15.6	27.7	40.6	82.6	1.3
2020	97.0	3.2	14.2	79.7	54.4	39.1	42.6	11.1	85.9	18.9	31.0	47.2	95.4	1.7
2021	95.4	3.0	13.6	78.7	55.5	41.6	39.9	9.9	85.4	17.8	30.3	47.3	93.9	1.4
2021 Q4	95.4	3.0	13.6	78.7	.	.	.	.	.	.	.	.	.	.
2022 Q1	95.2	2.9	13.4	78.9	.	.	.	.	.	.	.	.	.	.
Q2	94.2	3.0	13.3	77.9	.	.	.	.	.	.	.	.	.	.
Q3	93.0	2.9	13.4	76.7	.	.	.	.	.	.	.	.	.	.

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

6 Fiscal developments

6.4 Annual change in the government debt-to-GDP ratio and underlying factors [1]
(as a percentage of GDP; flows during one-year period)

	Change in debt-to-GDP ratio [2]	Primary deficit (+)/ surplus (-)	Deficit-debt adjustment								Interest-growth differential	Memo item: Borrowing requirement
			Total	Transactions in main financial assets					Revaluation effects and other changes in volume	Other		
				Total	Currency and deposits	Loans	Debt securities	Equity and investment fund shares				
	1	2	3	4	5	6	7	8	9	10	11	12
2018	-2.0	-1.4	0.4	0.4	0.4	-0.1	0.0	0.2	0.0	-0.1	-1.0	0.8
2019	-2.0	-1.0	0.1	0.2	0.1	0.0	0.0	0.2	-0.2	0.0	-1.1	0.9
2020	13.1	5.5	2.2	2.5	2.0	0.4	-0.1	0.1	-0.3	0.0	5.4	9.5
2021	-1.7	3.7	-0.1	0.6	0.4	0.1	0.0	0.1	-0.1	-0.6	-5.3	5.1
2021 Q4	-1.7	3.7	-0.1	0.6	0.4	0.1	0.0	0.1	-0.1	-0.6	-5.3	5.1
2022 Q1	-4.4	2.5	0.4	0.9	0.5	0.1	0.0	0.2	0.0	-0.5	-7.3	4.4
Q2	-3.7	1.3	0.9	1.2	0.9	0.1	0.0	0.2	0.1	-0.4	-5.8	3.7
Q3	-4.3	1.0	0.4	0.3	-0.2	0.3	0.0	0.2	0.2	-0.1	-5.8	2.8

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

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

	Debt service due within 1 year [2]					Average residual maturity in years [3]	Average nominal yields [4]						
	Total	Principal		Interest			Outstanding amounts					Transactions	
			Maturities of up to 3 months		Maturities of up to 3 months		Total	Floating rate	Zero coupon	Fixed rate		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	14.2	13.0	4.5	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	14.7	13.4	5.0	1.3	0.3	8.0	1.6	1.1	-0.3	1.9	1.8	-0.1	0.4
Q2	14.6	13.3	4.7	1.3	0.3	8.0	1.6	1.1	-0.2	1.9	1.8	0.1	0.4
Q3	14.0	12.8	4.0	1.3	0.3	8.1	1.6	1.1	0.0	1.9	1.9	0.6	0.4
2022 Aug.	14.5	13.3	4.7	1.3	0.3	8.0	1.6	1.1	-0.1	1.9	1.8	0.3	0.3
Sep.	14.0	12.8	4.0	1.3	0.3	8.1	1.6	1.1	0.0	1.9	1.9	0.6	0.4
Oct.	14.4	13.1	3.8	1.3	0.3	8.1	1.6	1.1	0.1	1.9	1.9	0.7	0.5
Nov.	14.4	13.1	3.9	1.3	0.3	8.1	1.6	1.2	0.3	1.9	1.9	1.0	0.5
Dec.	14.2	13.0	4.5	1.3	0.3	8.0	1.6	1.2	0.4	1.8	1.9	1.1	0.5
2023 Jan.	14.2	12.9	4.6	1.3	0.3	8.0	1.7	1.2	0.5	1.9	1.9	1.4	0.6

Source: ECB.
1) At face value and not consolidated within the general government sector.
2) Excludes future payments on debt securities not yet outstanding and early redemptions.
3) Residual maturity at the end of the period.
4) Outstanding amounts at the end of the period; transactions as 12-month average.

6 Fiscal developments

6.6 Fiscal developments in euro area countries
(as a percentage of GDP; flows during one-year period and outstanding amounts at end of period)

	Belgium	Germany	Estonia	Ireland	Greece	Spain	France	Italy	Cyprus
	1	2	3	4	5	6	7	8	9
Government deficit (-)/surplus (+)									
2018	-0.9	1.9	-0.6	0.1	0.9	-2.6	-2.3	-2.2	-3.6
2019	-1.9	1.5	0.1	0.5	1.1	-3.1	-3.1	-1.5	1.3
2020	-9.0	-4.3	-5.5	-5.0	-9.9	-10.1	-9.0	-9.5	-5.8
2021	-5.6	-3.7	-2.4	-1.7	-7.5	-6.9	-6.5	-7.2	-1.7
2021 Q4	-5.6	-3.7	-2.4	-1.7	-7.5	-6.9	-6.5	-7.2	-1.7
2022 Q1	-4.8	-2.8	-1.8	-0.2	-5.1	-5.4	-5.1	-6.5	0.0
Q2	-4.0	-1.7	-0.6	0.1	-2.4	-4.6	-3.9	-5.3	1.3
Q3	-3.7	-1.9	-0.2	1.2	-2.1	-3.8	-4.0	-4.9	2.6
Government debt									
2018	99.9	61.3	8.2	63.0	186.4	100.4	97.8	134.4	98.1
2019	97.6	58.9	8.5	57.0	180.6	98.2	97.4	134.1	90.4
2020	112.0	68.0	18.5	58.4	206.3	120.4	115.0	154.9	113.5
2021	109.2	68.6	17.6	55.4	194.5	118.3	112.8	150.3	101.0
2021 Q4	109.2	68.6	17.6	55.4	194.5	118.3	112.8	150.3	101.1
2022 Q1	109.0	67.4	17.2	53.1	189.6	117.4	114.6	152.1	102.0
Q2	108.3	67.2	16.7	51.2	183.5	116.1	113.1	150.4	95.3
Q3	106.3	66.6	15.8	49.0	178.2	115.6	113.4	147.3	91.6

	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Austria	Portugal	Slovenia	Slovakia	Finland
	10	11	12	13	14	15	16	17	18	19
Government deficit (-)/surplus (+)										
2018	-0.8	0.5	3.0	2.1	1.5	0.2	-0.3	0.7	-1.0	-0.9
2019	-0.6	0.5	2.2	0.6	1.8	0.6	0.1	0.6	-1.2	-0.9
2020	-4.3	-7.0	-3.4	-9.4	-3.7	-8.0	-5.8	-7.7	-5.4	-5.5
2021	-7.0	-1.0	0.8	-7.8	-2.6	-5.9	-2.9	-4.7	-5.5	-2.7
2021 Q4	-7.0	-1.0	0.8	-7.5	-2.6	-5.9	-2.9	-4.7	-5.5	-2.8
2022 Q1	-5.2	0.0	0.8	-7.5	-1.5	-3.5	-1.6	-3.6	-4.8	-2.1
Q2	-3.6	1.0	0.9	-6.7	0.1	-1.5	0.2	-3.1	-3.8	-1.6
Q3	-3.2	0.9	0.7	-5.5	0.5	-1.9	1.1	-2.7	-3.7	-1.3
Government debt										
2018	37.0	33.7	20.9	43.7	52.4	74.1	121.5	70.3	49.4	64.9
2019	36.5	35.8	22.4	40.7	48.5	70.6	116.6	65.4	48.0	64.9
2020	42.0	46.3	24.5	53.3	54.7	82.9	134.9	79.6	58.9	74.8
2021	43.6	43.7	24.5	56.3	52.4	82.3	125.5	74.5	62.2	72.4
2021 Q4	43.6	43.7	24.5	55.2	52.4	82.3	125.5	74.5	62.2	72.3
2022 Q1	41.7	39.8	22.6	56.2	50.7	83.4	124.8	74.7	61.6	72.2
Q2	41.6	39.6	25.3	53.9	50.8	82.6	123.4	73.5	60.3	71.7
Q3	39.9	37.3	24.6	53.2	49.0	81.3	120.1	72.3	58.6	70.8

Source: Eurostat.