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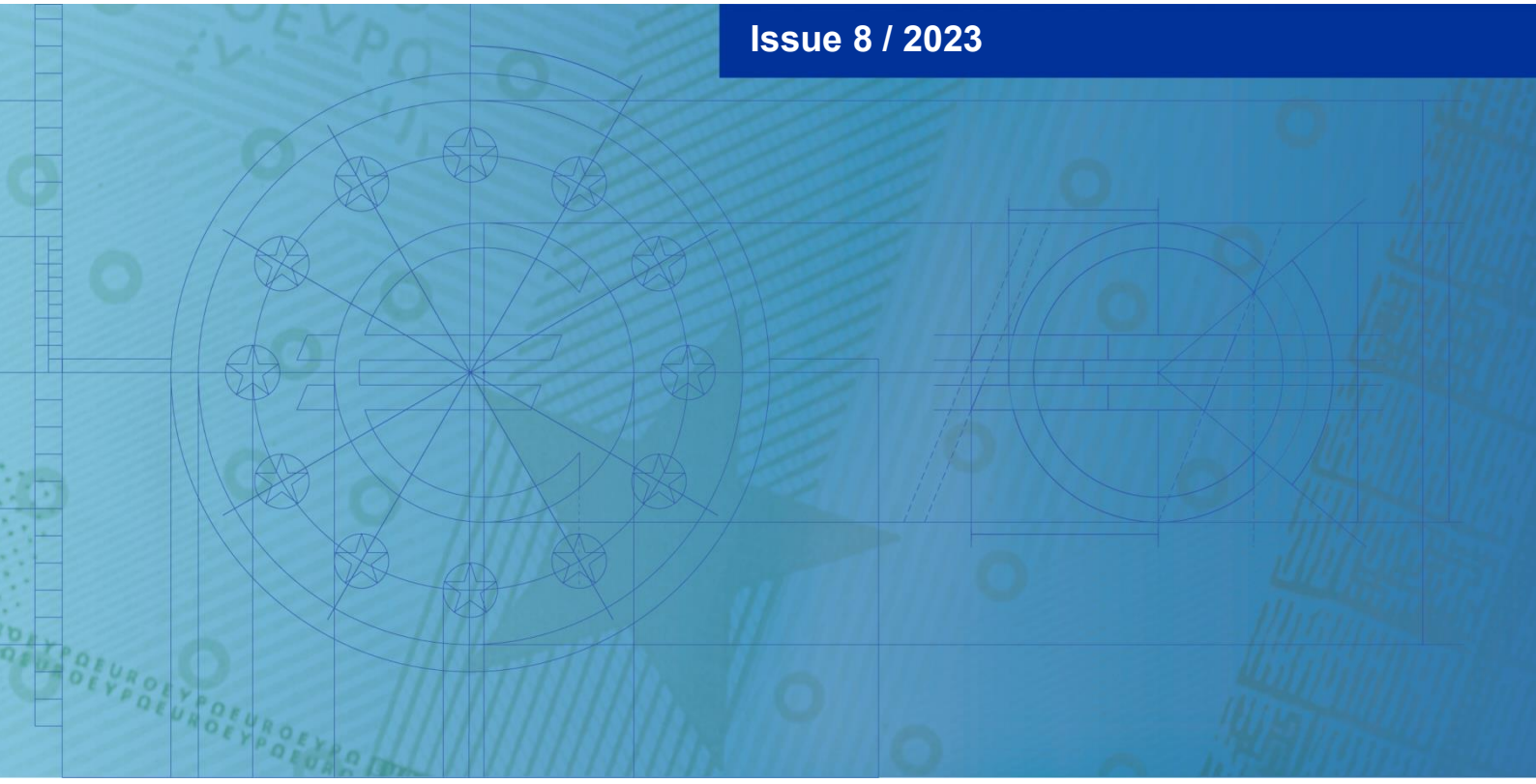

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Economic, financial and monetary developments

Overview

The Governing Council decided at its meeting on 14 December 2023 to keep the three key ECB interest rates unchanged. While inflation has dropped in recent months, it is likely to pick up again temporarily in the near term.[1] According to the December 2023 Eurosystem staff macroeconomic projections for the euro area, inflation is expected to decline gradually over the course of 2024, before approaching the Governing Council's 2% target in 2025. Overall, Eurosystem staff expect headline inflation to average 5.4% in 2023, 2.7% in 2024, 2.1% in 2025 and 1.9% in 2026. Compared with the September 2023 ECB staff macroeconomic projections for the euro area, this amounts to a downward revision for 2023 and especially for 2024.

Underlying inflation has eased further. But domestic price pressures remain elevated, primarily owing to strong growth in unit labour costs. Eurosystem staff expect inflation excluding energy and food to average 5.0% in 2023, 2.7% in 2024, 2.3% in 2025 and 2.1% in 2026.

The past interest rate increases continue to be transmitted forcefully to the economy. Tighter financing conditions are dampening demand, and this is helping to push down inflation. Eurosystem staff expect economic growth to remain subdued in the near term. Beyond that, the economy is expected to recover because of rising real incomes – as people benefit from falling inflation and growing wages – and improving foreign demand. Eurosystem staff therefore see growth picking up from an average of 0.6% for 2023 to 0.8% for 2024, and to 1.5% for both 2025 and 2026.

The Governing Council is determined to ensure that inflation returns to its 2% medium-term target in a timely manner. Based on its current assessment, the Governing Council considers that the key ECB interest rates are at levels that, maintained for a sufficiently long duration, will make a substantial contribution to this goal. The Governing Council's future decisions will ensure that its policy rates will be set at sufficiently restrictive levels for as long as necessary.

The Governing Council will continue to follow a data-dependent approach to determining the appropriate level and duration of restriction. In particular, its interest rate decisions will be based on 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 key ECB interest rates are the primary tool for setting the monetary policy stance. At its meeting on 14 December 2023, the Governing Council also decided to

[1] The cut-off date for data included in this issue of the Economic Bulletin was 13 December 2023.

advance the normalisation of the Eurosystem's balance sheet. It intends to continue to reinvest, in full, the principal payments from maturing securities purchased under the pandemic emergency purchase programme (PEPP) during the first half of 2024. Over the second half of the year, it intends to reduce the PEPP portfolio by €7.5 billion per month on average. The Governing Council intends to discontinue reinvestments under the PEPP at the end of 2024.

Economic activity

The euro area economy contracted slightly in the third quarter of 2023, mostly owing to a decline in inventories. Tighter financing conditions and subdued foreign demand are likely to continue weighing on economic activity in the near term. Prospects are especially weak for construction and manufacturing, the two sectors most affected by higher interest rates. Services activity is also set to soften in the coming months. This is due to spillovers from weaker industrial activity, fading effects from the reopening of the economy and the broadening impact of tighter financing conditions.

The labour market continues to support the economy. The unemployment rate stood at 6.5% in October and employment grew by 0.2% over the third quarter. At the same time, the weaker economy is dampening the demand for workers, with firms advertising fewer vacancies in recent months. Moreover, even though more people are in work, the total number of hours worked edged down by 0.1% in the third quarter.

According to the December 2023 projections, available short-term indicators suggest that economic activity will remain weak in the fourth quarter of 2023. However, growth is expected to strengthen from early 2024 onwards, as real disposable income rises – supported by declining inflation, robust wage growth and resilient employment – and export growth catches up with improvements in foreign demand. The impact of the ECB's monetary policy tightening and adverse credit supply conditions continues to feed through to the economy, affecting the near-term growth outlook. These dampening effects are expected to fade later in the projection horizon, supporting growth. Overall, annual average real GDP growth is expected to slow down from 3.4% in 2022 to 0.6% in 2023, before recovering to 0.8% in 2024 and stabilising at 1.5% in 2025 and 2026. Compared with the September 2023 projections, the outlook for GDP growth has been slightly revised down for 2023-24, on the back of the recent data releases and weak survey data, whereas it is unrevised for 2025.

As the energy crisis fades, governments should continue to roll back the related support measures. This is essential to avoid driving up medium-term inflationary pressures, which would otherwise call for even tighter monetary policy. Fiscal policies should be designed to make the euro area economy more productive and to gradually bring down high public debt. Structural reforms and investments to enhance the euro area's supply capacity – which would be supported by the full implementation of the Next Generation EU programme – can help reduce price pressures in the medium term, while supporting the green and digital transitions. To

that end, it is important to swiftly agree on the reform of the EU's economic governance framework. Moreover, it is imperative that progress towards capital markets union and the completion of banking union be accelerated.

Inflation

Inflation dropped over October and November 2023, falling to an annual rate of 2.4% in November according to Eurostat's flash release. This decline was broad-based. Energy price inflation fell further and food price inflation also came down, despite remaining relatively high overall. In December 2023 inflation is likely to pick up on account of an upward base effect for the cost of energy. In 2024 Eurosystem staff expect inflation to decline more slowly because of further upward base effects and the phasing-out of past fiscal measures aimed at limiting the repercussions of the energy price shock.

Inflation excluding energy and food dropped by almost a full percentage point over October and November 2023, falling to 3.6% in November. This reflects improving supply conditions, the fading effects of the past energy shock and the impact of tighter monetary policy on demand and on the pricing power of firms. The inflation rates for goods and services fell to 2.9% and 4.0% respectively.

All measures of underlying inflation declined in October, but domestic price pressures remained elevated, chiefly because of strong wage growth together with falling productivity. Measures of longer-term inflation expectations mostly stand around 2%, with some market-based indicators of inflation compensation declining from elevated levels.

According to the December 2023 projections, the expected temporary pick-up in inflation notwithstanding, the underlying disinflationary process is expected to continue. Despite some cooling, the labour market is projected to remain tight which, together with compensation effects from past high inflation, should keep nominal wage growth high. Nevertheless, wage growth is expected to ease over the projection horizon as the upward impacts from inflation compensation gradually fade. Profits expanded notably in 2022, but are set to weaken over the projection horizon and provide a buffer to the pass-through of labour costs. Overall, with medium-term inflation expectations assessed to remain anchored at the ECB's 2% inflation target, headline HICP inflation is expected to decrease from 5.4% in 2023 to an average of 2.7% in 2024, 2.1% in 2025 and 1.9% in 2026. Compared with the September 2023 projections, HICP inflation has been revised down for 2023 and 2024, mainly owing to lower than expected recent data outturns and lower assumptions for energy commodity prices, whereas it is unrevised for 2025.

Risk assessment

The risks to economic growth remain tilted to the downside. Growth could be lower if the effects of monetary policy turn out stronger than expected. A weaker world

economy or a further slowdown in global trade would also weigh on euro area growth. Russia's unjustified war against Ukraine and the tragic conflict in the Middle East are key sources of geopolitical risk. This may result in firms and households becoming less confident about the future. Growth could be higher if rising real incomes raise spending by more than anticipated, or the world economy grows more strongly than expected.

Upside risks to inflation include the heightened geopolitical tensions, which could raise energy prices in the near term, and extreme weather events, which could drive up food prices. Inflation could also turn out higher than anticipated if inflation expectations were to move above the Governing Council's target, or if wages or profit margins increased by more than expected. By contrast, inflation may surprise on the downside if monetary policy dampens demand by more than expected or the economic environment in the rest of the world worsens unexpectedly, potentially owing in part to the recent rise in geopolitical risks.

Financial and monetary conditions

Market interest rates have fallen markedly since the Governing Council's monetary policy meeting on 26 October 2023 and lie below the rates embedded in the staff projections. The Governing Council's restrictive monetary policy continues to transmit strongly into broader financing conditions. Lending rates rose again in October, to 5.3% for business loans and 3.9% for mortgages.

Higher borrowing rates, subdued loan demand and tighter loan supply have further weakened credit dynamics. Loans to firms declined at an annual rate of 0.3% in October and loans to households also remained subdued, growing at an annual rate of 0.6%. With weaker lending and the reduction in the Eurosystem's balance sheet, broad money – as measured by M3 – has continued to contract. In October it fell at an annual rate of 1.0%.

In line with its monetary policy strategy, the Governing Council thoroughly assessed the links between monetary policy and financial stability. Euro area banks have demonstrated their resilience. They have high capital ratios and have become significantly more profitable over the past year. But the financial stability outlook remains fragile in the current environment of tightening financing conditions, weak growth and geopolitical tensions. In particular, the situation could worsen if banks' funding costs were to increase by more than expected and if more borrowers were to struggle to repay their loans. At the same time, the overall impact of such a scenario on the economy should be contained if financial markets react in an orderly fashion. Macroprudential policy remains the first line of defence against the build-up of financial vulnerabilities, and the measures in place contribute to preserving the financial system's resilience.

Monetary policy decisions

The interest rate on the main refinancing operations and the interest rates on the marginal lending facility and the deposit facility remain unchanged at 4.50%, 4.75% and 4.00% respectively.

The asset purchase programme portfolio is declining at a measured and predictable pace, as the Eurosystem no longer reinvests the principal payments from maturing securities.

The Governing Council intends to continue to reinvest, in full, the principal payments from maturing securities purchased under the PEPP during the first half of 2024. Over the second half of the year, it intends to reduce the PEPP portfolio by €7.5 billion per month on average. The Governing Council intends to discontinue reinvestments under the PEPP at the end of 2024.

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 and their ongoing repayment are contributing to its monetary policy stance.

Conclusion

The Governing Council decided at its meeting on 14 December 2023 to keep the three key ECB interest rates unchanged. The Governing Council is determined to ensure that inflation returns to its 2% medium-term target in a timely manner. Based on its current assessment, the Governing Council considers that rates are at levels that, maintained for a sufficiently long duration, will make a substantial contribution to the timely return of inflation to the target. The Governing Council's future decisions will ensure that the key ECB interest rates will be set at sufficiently restrictive levels for as long as necessary to ensure such a timely return. The Governing Council will continue to follow a data-dependent approach to determining the appropriate level and duration of restriction.

The Governing Council intends to reduce the PEPP portfolio over the second half of 2024 and to discontinue its reinvestments under the PEPP at the end of 2024.

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

1 External environment

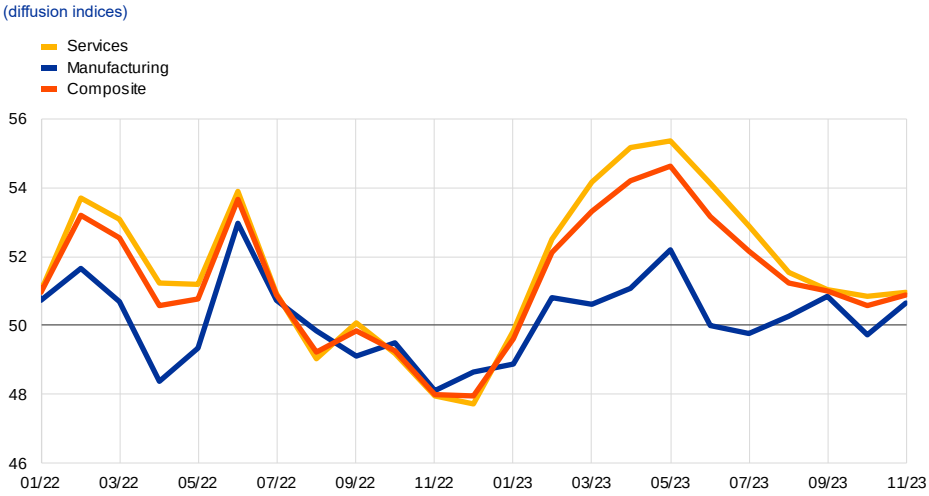
The global economy is estimated to have expanded at a moderate but steady pace in 2023 reflecting strong private consumption and the support of resilient labour markets. Global growth is projected to decrease slightly in 2024, mainly reflecting the impact of monetary policy tightening across advanced economies. Compared with the September 2023 ECB staff macroeconomic projections, the outlook for global growth in the December 2023 Eurosystem staff macroeconomic projections remains broadly unchanged, with the global economy still projected to expand at a rate below the historical average over the projection horizon. After a weak performance in 2023, global trade growth is expected to pick up again over the rest of the projection horizon and increase broadly in line with global activity. Compared with the September projections, growth in both global imports and euro area foreign demand has been revised upwards for 2023, largely on account of better than estimated outturns in the second and third quarter. However, foreign demand growth over the rest of the projection horizon has been revised downwards compared with the September projections. Export prices of euro area competitors (in national currencies) are estimated to have declined sharply in the second quarter of 2023, as commodity prices continued to fall and domestic and foreign pipeline pressures eased. They are projected to rebound gradually and converge towards their long-term average growth rate over the projection horizon.

In 2023 global economic growth was moderate but steady amid strong private consumption and resilient labour markets. Global economic activity has been underpinned by emerging market economies including China, and, among advanced economies, by the United States.[2] Solid domestic demand and a strong labour market in the United States resulted in robust growth despite significant monetary policy tightening. In China, the lifting of coronavirus (COVID-19) restrictions at the start of the year and a broader recovery in private consumption compensated for weakness in the residential sector. Most recent data provide mixed signals across large economies. While real GDP growth strengthened in both China and the United States in the third quarter, it remained flat in the United Kingdom and contracted in Japan as a result of high inflation weighing on activity and consumption in both. Global real GDP is expected to decelerate slightly in the fourth quarter as previous tailwinds dissipate, which is in line with the latest global composite output Purchasing Managers' Index (PMI). After declining for six consecutive months, the composite PMI broadly stabilised in November and remains in expansionary territory. Across sectors, PMI data suggest that manufacturing activity remains subdued, with the index still hovering around the neutral threshold. At the same time, post-COVID-19 growth momentum seems to be waning for services, with the related PMI declining steadily during the second half of the year before stabilising slightly above the neutral threshold in November (Chart 1).

[2] 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.

Chart 1

Global PMI output (excluding the euro area)



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

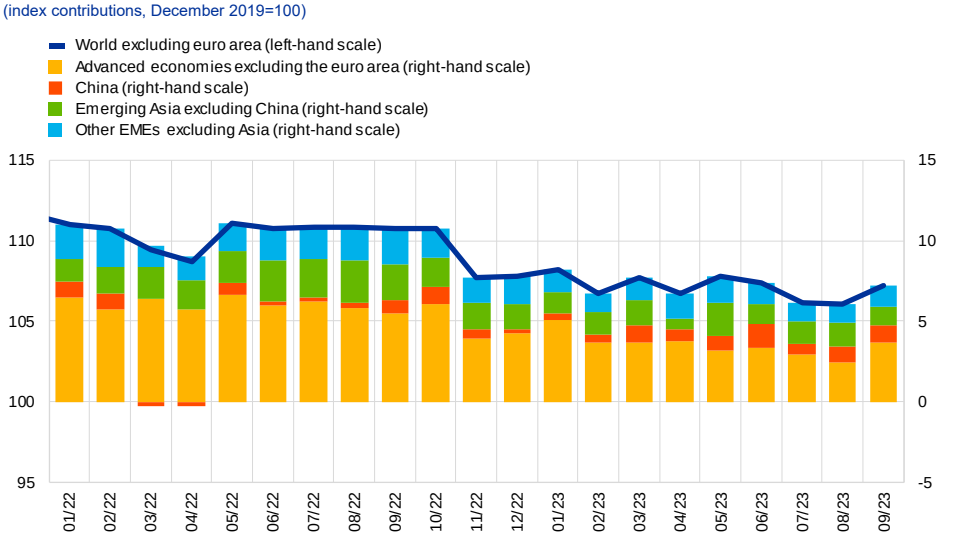
The global economy is projected to expand at a rate below the historical average over the projection horizon. Global growth is projected to slow down slightly in 2024 (3.1% compared with 3.3% in 2023), which mainly reflects the delayed impact of monetary policy tightening across advanced economies. At the same time, growth prospects in advanced economies have been reassessed. In the United States, real GDP growth has been revised upwards, with recent economic resilience suggesting a softer landing and a smoother disinflationary process. In the United Kingdom, the economy is expected to avoid a recession, but growth has been revised downwards in 2024 and 2025 to reflect weaker data and the impact of monetary policy tightening amid high inflation. The growth outlook remains broadly unrevised in emerging Asia and China. In China, economic growth is projected to gradually decrease over the projection horizon owing to structural factors, such as population ageing. The global economy is projected to continue growing at a rate of 3.2% in both 2025 and 2026, which remains below the 2012-19 historical average of 3.6%. Compared with the September 2023 projections, global real GDP growth has been revised up by 0.1 percentage point for both 2023 and 2024.

As consumption patterns return to normal after the pandemic, world trade growth is expected to remain weak in 2023 and to recover thereafter. Annual trade growth in 2023 is estimated at 1.1% owing to a negative carryover effect, but had already shown signs of improvement as early as the second quarter of 2023. The weak trade performance in annual terms is explained by global growth having a less trade-friendly composition as a result of consumption making up a bigger share of domestic demand and the larger contribution made by emerging countries, which have a lower trade elasticity. Trade growth this year was also hindered by the rebound in services consumption owing to the complete lifting of COVID-19 restrictions. Over the projection horizon, global trade is projected to recover gradually and start growing more in line with global activity, as firms start to restock and private consumption patterns turn back towards goods. This is in line with the

latest data for global merchandise trade, which returned to positive growth in September after remaining broadly flat in the previous two months (Chart 2). Global trade is projected to grow by 3.0% in 2024 and 2025 and by 3.2% in 2026, a downward revision compared with the September projections (by -0.2 percentage points in 2024 and -0.3 percentage points in 2025), reflecting our reassessment of the speed at which global trade elasticity will return to its expected long-term value. Euro area foreign demand is projected to grow by 2.6% in 2024, 2.9% in 2025 and 3.1% in 2026 and it has also been revised downwards compared with the previous round of projections in both 2024 and 2025 (by -0.4 and -0.1 percentage points respectively).

Chart 2

Global merchandise import growth (excluding the euro area)

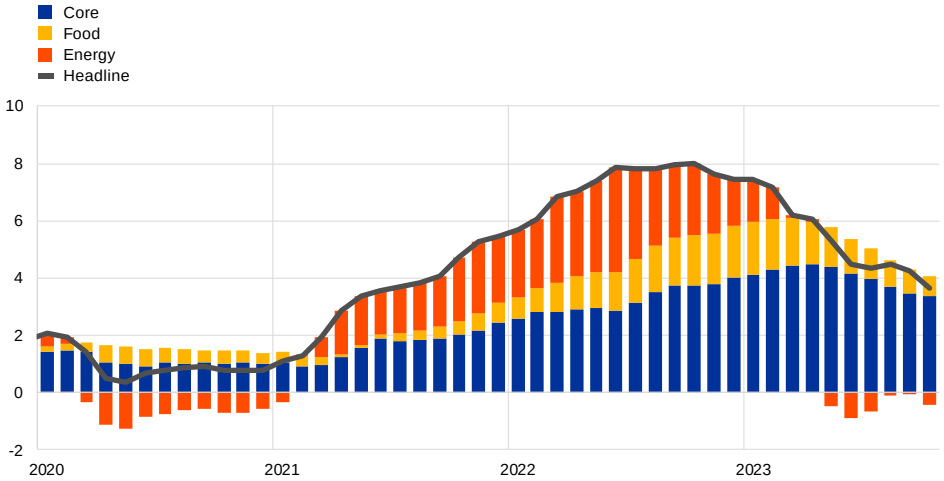


Sources: CPB and ECB staff calculations.
Note: The latest observations are for September 2023.

Global headline consumer price index (CPI) inflation remains on a downward path, supported by lower energy and food prices, although core inflation remains high. Headline CPI inflation across the member countries of the Organisation for Economic Co-operation and Development (OECD) decreased in October to 5.6% (from 6.2% in September), reflecting a fall in the contribution of energy and, to a lesser extent, food components. Core (excluding food and energy) inflation declined by a smaller margin to 6.5% (from 6.6% in September). Annual inflation remains very high in Türkiye, although it did moderate somewhat in October to 72% (down from 75% in September). Excluding Türkiye, headline inflation declined to 3.6% from 4.2% in September and core inflation declined from 4.4% to 4.2% (Chart 3). Euro area competitors' export prices are estimated to have dropped below their long-term average growth rate in the second quarter of 2023, as commodity prices continued to fall and domestic and foreign pipeline pressures eased. They are projected to rebound at the turn of the year as the decline in commodity prices exerts less of a drag.

Chart 3
OECD consumer price inflation

(annual percentage changes, percentage point contributions)



Sources: OECD and ECB calculations.
Notes: The OECD aggregate excludes Türkiye and is calculated using OECD consumer price index annual weights. Core inflation refers to inflation for all items excluding food and energy. The latest observations are for October 2023.

Crude oil prices have declined since the September 2023 projections amid weakening global demand. According to the International Energy Agency, oil demand in Europe weakened by around 0.8 million barrels per day during the third quarter, while US oil demand has also started to decline more recently. Weakening demand in advanced economies outweighed upward price pressures stemming from continuously strong oil demand from China, the decision by OPEC+ to extend existing voluntary production cuts to the first quarter of 2024 and to raise them by an additional 0.9% of global supply, and supply risks resulting from the conflict in the Middle East. European gas prices also declined as demand remained below historical averages at the beginning of the heating season. Recent supply risks from the closure of an Israeli gas field, disruptions in the gas pipeline between Finland and Estonia and the possibility of further strikes at liquified natural gas terminals in Australia were also resolved and priced out by financial markets. However, further volatility in the gas market cannot be completely ruled out because prices remain sensitive to supply shocks similar to those experienced throughout 2023.

Compared with the September 2023 projections, global financial conditions fluctuated but ultimately eased slightly across advanced economies. At the start of the review period (from 14 September to 13 December 2023), they tightened considerably across advanced economies as long-term sovereign bond yields were driven up, mainly as a result of higher risk compensation owing to greater uncertainty about future short-term interest rates. However, this tightening was more than reversed after inflation came in slightly below expectations in several jurisdictions, while some central banks also softened their communication on whether additional interest rate increases would be necessary. In the United States, market expectations that inflation would soften further amid resilient but slowing growth fostered a downward shift in monetary policy expectations and supported risk

sentiment. In general, the price of riskier assets moved in tandem with interest rate fluctuations to end the period slightly higher.

US economic growth in 2023 has been more resilient than previously anticipated but is expected to moderate in the near term as tighter monetary policy restrains spending and the labour market loosens. Real GDP in the third quarter of 2023 grew by 1.3% quarter on quarter (5.2% on an annualised basis) on the back of buoyant private consumption, a rebound in private inventory investment and strong government spending. High frequency indicators, such as credit card spending and retail sales, suggest a deceleration in consumer spending in the fourth quarter. In addition, the resumption of student loan repayments in October and the steep reduction in excess savings will exert additional pressure on household balance sheets. Economic growth is expected to recover from the second half of 2024 onwards. In October, annual headline CPI inflation fell to 3.2% (0.5 percentage points lower than in September), mainly owing to falling energy prices, while annual core inflation ticked down slightly to 4.0% (0.1 percentage point lower than in September). Although it has fallen since the start of this year, services inflation (excluding housing) remained high at just below 4% in October, while both core goods and services inflation are on a downward path.

In China, recent indicators point to a stabilisation in economic activity despite weakness in the real estate sector. In the third quarter of 2023 real GDP growth rebounded to 1.3% quarter on quarter, above market expectations. This upturn was primarily driven by stronger consumer spending, while the contraction in property investment continued to deepen, albeit at a slower pace compared with previous months. Monthly indicators on industrial production and retail sales consolidated their recovery in October. Household spending surprised to the upside in October, particularly for car purchases and travel, coinciding with the Chinese Golden Week holiday. At the same time, the production and consumption of goods and services closely related to the property market continued to show subdued growth, suggesting an ongoing two-speed recovery within the Chinese economy. Annual headline CPI inflation returned to negative territory again in October. Headline CPI inflation fell by 0.2% year on year after remaining unchanged in September. The downturn was primarily attributed to a sharper decline in food prices, led by a 30.1% year-on-year contraction in pork prices, which are expected to continue falling owing to an oversupply of pork. Food price developments and weak domestic and external demand are likely to ensure inflationary pressures remain subdued.

In Japan, the economic recovery stalled in the third quarter of 2023, but growth is expected to return to positive territory in the fourth quarter of the same year. Real GDP in the third quarter of 2023 contracted by a stronger-than-expected 0.7% quarter on quarter, mainly reflecting the negative contribution from inventories and weak domestic demand and to some extent the impact of high inflation on real incomes. Real GDP is expected to return to positive but modest growth in the fourth quarter amid signs of a moderate rebound in real consumption levels. Both headline and core inflation rates picked up in October amid firm underlying price momentum. Annual headline inflation rose from 3.0% to 3.3%, mostly reflecting lower annual energy price declines, notwithstanding some moderation in still high food inflation.

Annual core inflation (excluding food and energy) stood at 2.7% in October (0.1 percentage point higher compared with September), echoing a slight pick-up in core goods inflation and firm services inflation.

In the United Kingdom, previous monetary policy tightening is increasingly weighing on household spending and private investment. Real economic growth flatlined in the third quarter of 2023 as weaker domestic demand offset a particularly positive contribution from services exports. Weakening domestic demand suggests that past monetary policy tightening is increasingly affecting the economy. The flow of data continues to be mixed, as retail sales have declined and the composite PMI has generally been subdued (although it did rise back above the neutral threshold in November), while other business confidence measures have long been improving and real household income is increasing. Activity is set to remain modest in the coming quarters amid restrictive fiscal and monetary policy. It is expected to pick up towards the end of the year supported by the ongoing recovery in real wages. Annual headline CPI inflation declined markedly in October to 4.6% from 6.7% in September as the contribution from energy prices turned negative. Core inflation fell to 5.7% from 6.1% in September reflecting a fall in both core goods and services inflation. Inflation is nevertheless expected to decline more gradually from here on, as services inflation is set to remain elevated against a background of still high wage growth.

2 Economic activity

The euro area economy has weakened further in the second half of 2023, as subdued confidence, earlier competitiveness losses, renewed geopolitical tensions and tighter financing conditions all weighed on activity. Having grown only minimally over the first half of the year, real GDP contracted slightly in the third quarter, mostly owing to a decline in inventories. At the sectoral level, industrial output has been in contractionary territory since the fourth quarter of 2022 – despite some support in manufacturing from the unwinding of earlier order backlogs – while services activity continued to contribute positively to growth into the third quarter. Meanwhile, employment expanded further in the third quarter, although total hours worked edged down slightly, amid persistent labour hoarding. Incoming data for the fourth quarter of 2023 suggest growth is likely to remain muted, while the labour market is expected to slow. Growth momentum is expected to start picking up early in 2024, barring further shocks, and despite continued headwinds from adverse financing conditions on activity that are expected, however, to fade over time. Moreover, falling inflation should help push up real incomes, and export growth should catch up with improvements in foreign demand.

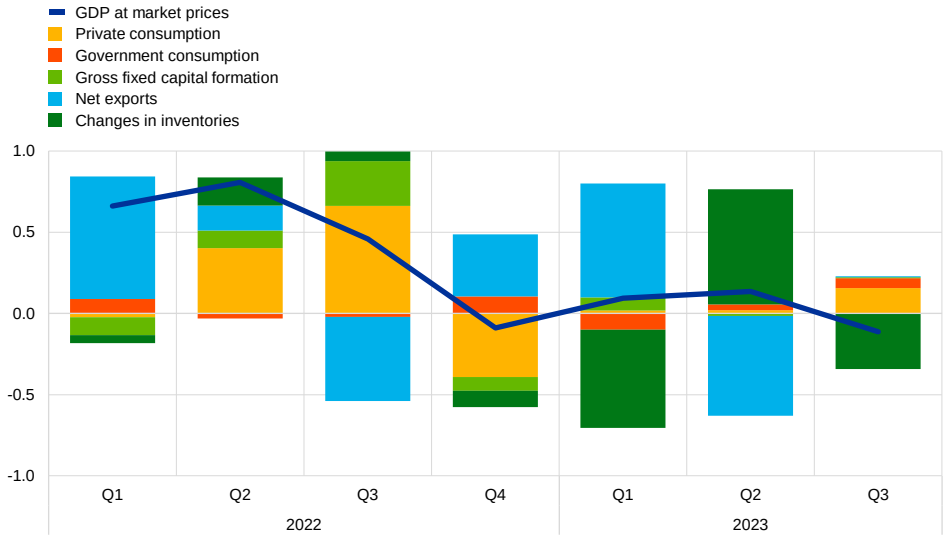
This outlook is broadly reflected in the December 2023 Eurosystem staff macroeconomic projections for the euro area, which foresee annual real GDP growth slowing to 0.6% in 2023, before picking up to 0.8% in 2024 and rising to 1.5% in 2025 and 2026. Compared with the September 2023 ECB staff macroeconomic projections for the euro area, the outlook for GDP growth has been revised down slightly for 2023 and 2024, but it is unrevised for 2025.

The euro area economy contracted slightly in the third quarter of 2023. Real GDP fell by 0.1% quarter on quarter in the third quarter, as changes in inventories – in part reflecting the unwinding of the strong inventory build-up in the second quarter – dragged on growth (Chart 4). After two quarters of stagnation, private consumption grew moderately in the third quarter, with government consumption also contributing positively to GDP growth, albeit to a lesser extent. The marginally positive contribution of investment masks a clear contrast between the continuing contraction in construction investment, but still positive growth in non-construction investment. The contributions from exports and imports largely offset each another. The breakdown of value added highlights the ongoing divergence across sectors into the third quarter, with modest growth in services activity, while all other sectors, particularly manufacturing, declined.

Chart 4

Euro area real GDP and its components

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



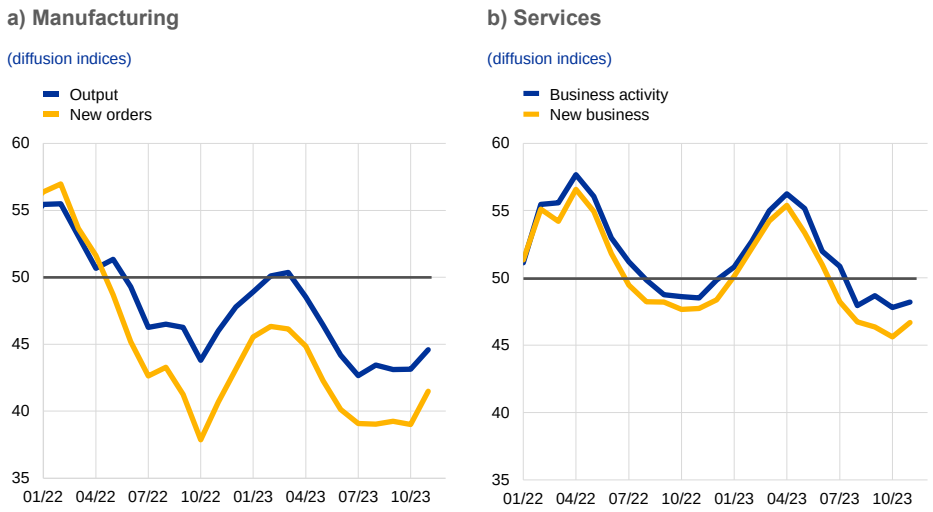
Sources: Eurostat and ECB calculations.
Note: The latest observations are for the third quarter of 2023.

Activity is expected to remain weak in the final quarter of 2023. Industrial production data for October suggest an ongoing contraction in manufacturing output in the fourth quarter. Incoming survey data – available for the period to November – point to a broader-based weakening of activity in the fourth quarter. This reflects both the continued weakness in manufacturing activity and a greater deceleration in services, which had previously shown resilience. The composite output Purchasing Managers' Index (PMI) continued to fall further below the growth threshold of 50 and below its third-quarter average, despite a small uptick in November on the October reading, possibly suggesting a bottoming out of the negative trend. The PMI for manufacturing output remains deep in contractionary territory, as earlier support from improved supply chain conditions looks to have run its course and backlogs of work are drying up, while new orders continue to contract (Chart 5, panel a). The weakness in activity is also evident – although less pronounced – in the services sector, where the PMI indicators for both business activity and new business have remained below the growth threshold since August (Chart 5, panel b). The European Commission's Economic Sentiment Indicator declined somewhat further below its third-quarter average in October and November, reflecting lower confidence among consumers and firms alike, albeit with some tentative signs of the weakness in confidence bottoming out in November. At the same time, firms across services and particularly manufacturing reported weaker demand and tightening financing conditions as increasing limits to production in the fourth quarter of the year.[3]

[3] See also the box entitled "Monetary policy and the recent slowdown in manufacturing and services" in this issue of the Economic Bulletin.

Chart 5

PMI indicators across sectors of the economy

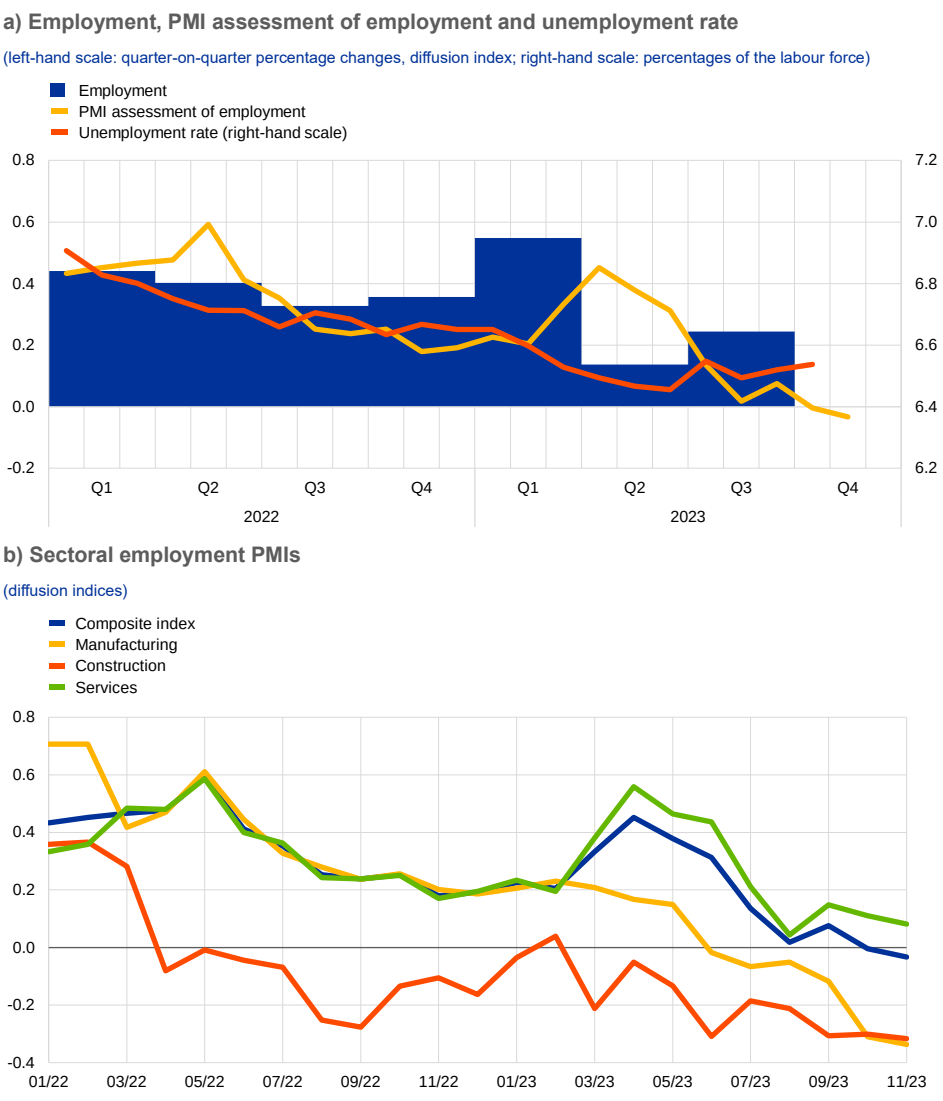


Source: S&P Global Market Intelligence.
Note: The latest observations are for November 2023.

Overall, the labour market remained resilient to weakening economic activity in the third quarter of 2023. Employment increased by 0.2% in the third quarter, while total hours worked declined by 0.1% (Chart 6, panel a). Employment has increased by 3.5% since the fourth quarter of 2019 and the total number of hours worked has risen by 2.1%. This implies a 1.3% decline in average hours worked, related to ongoing labour hoarding (the part of labour input which is not fully utilised by a company during its production process at any given point in time), as well as to other factors such as an increase in sick leave. The labour force edged up once again, by 0.1% in the third quarter of 2023 and an additional 0.2% in October. It is estimated to have increased by about 1.5 million people since December 2022. The unemployment rate was 6.5% in October, broadly unchanged compared with September and remaining close to its lowest level since the euro was introduced. Labour demand is gradually declining but remains at high levels, with the job vacancy rate falling marginally to 2.9%, 0.1 percentage points lower than in the previous quarter.

Chart 6

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



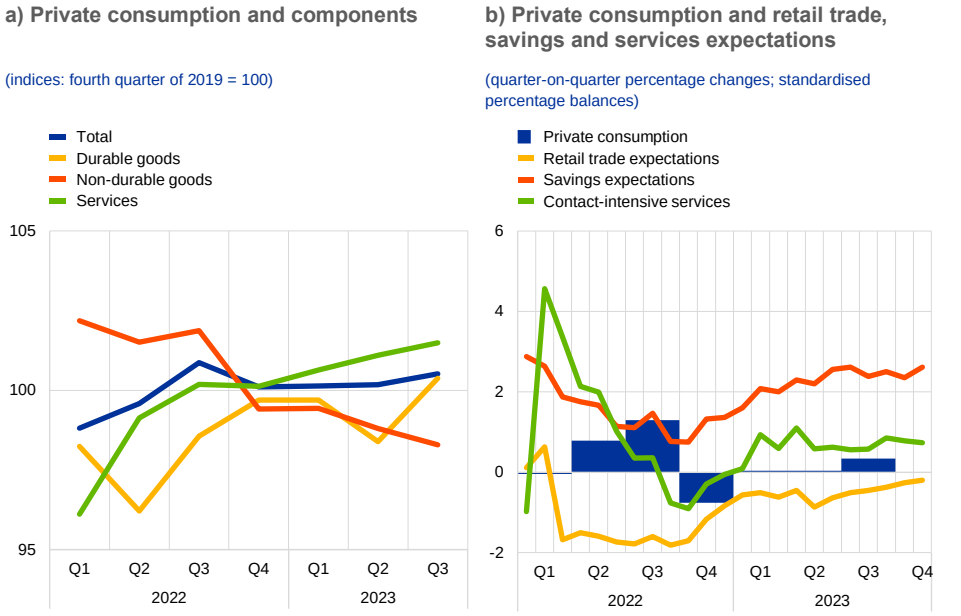
Sources: Eurostat, S&P Global Market Intelligence and ECB calculations.
Notes: In panel a), the two lines indicate monthly developments, while the bars show quarterly data. The PMI is expressed in terms of the deviation from 50, then divided by 10. The latest observations are for the third quarter of 2023 for employment, November 2023 for the PMI assessment of employment and October 2023 for the unemployment rate. In panel b), the PMIs are expressed in terms of the deviation from 50, divided by 10.

Short-term labour market indicators suggest a slowdown in employment growth in the fourth quarter of 2023. The monthly composite PMI employment indicator declined from 50.0 in October to 49.7 in November; a value below the threshold of 50 indicates a decrease in employment. This indicator has declined substantially from its peak of 54.5 in April. The recent fall has been broad-based across sectors (Chart 6, panel b). Sectoral PMIs indicate downside risks to employment growth in manufacturing and construction, where the indices are below 50. While still in slightly expansionary territory, the PMI services indicator also declined and is now close to the threshold of 50.

Private consumption increased by 0.3% in the third quarter of 2023, after stagnating in the first half of the year (Chart 7, panel a). The increase in the third quarter was largely driven by households' consumption of services, which is still benefiting from lingering reopening effects. Following a strong fall in the second quarter, spending on durable goods rebounded in the third quarter, largely reflecting delayed deliveries of previously purchased electric and hybrid vehicles. After a strong recovery, new passenger car registrations declined marginally in October to stand 0.8% below their third quarter level. By contrast, spending on non-durable (and semi-durable) goods continued to fall in the third quarter. This was reflected in the ongoing weakness in retail sales volumes, which, despite having increased marginally in October compared with the previous month, were 0.2% below their third-quarter average.

Chart 7

Real private consumption and expectations



Sources: Eurostat, European Commission and ECB calculations.
Notes: In panel a), the levels of consumption components (domestic concept) are scaled to match the level of total private consumption (national concept). "Non-durable goods" include semi-durables. In panel b), savings expectations for the next 12 months and retail trade business expectations for the next three months are standardised over the period 1985-2019. Expected demand for contact-intensive services in the next three months is standardised over the period 2005-19 (in line with the respective length of each series); "contact-intensive services" refers to accommodation, travel and food services. The latest observations are for the third quarter of 2023 for panel a) and for the third quarter of 2023 and November 2023 for panel b).

Incoming survey data continue to point to overall weakness in spending on goods at the turn of the year. The European Commission's consumer confidence indicator picked up in November after declining for three consecutive months, but continued to stand below its long-term average. The November outcome reflects improving expectations about the general economic outlook and households' own financial situations. At the same time, the Commission's indicators for expected major purchases by consumers and expected retail trade business remained subdued, despite a small improvement in the latter (Chart 7, panel b). By contrast, there was no strong downward correction in expected demand for contact-intensive services, which remained resilient in November and above its historical average. Similarly, the ECB's Consumer Expectations Survey (CES) of October indicates

resilient expected demand for holiday bookings. The transmission of tighter financing conditions to the real economy is likely to curb household borrowing, maintain high savings expectations and keep consumer spending growth subdued in the near term.[4] At the same time, consumer spending should benefit from improving purchasing power on the back of falling inflation and a still resilient labour market.

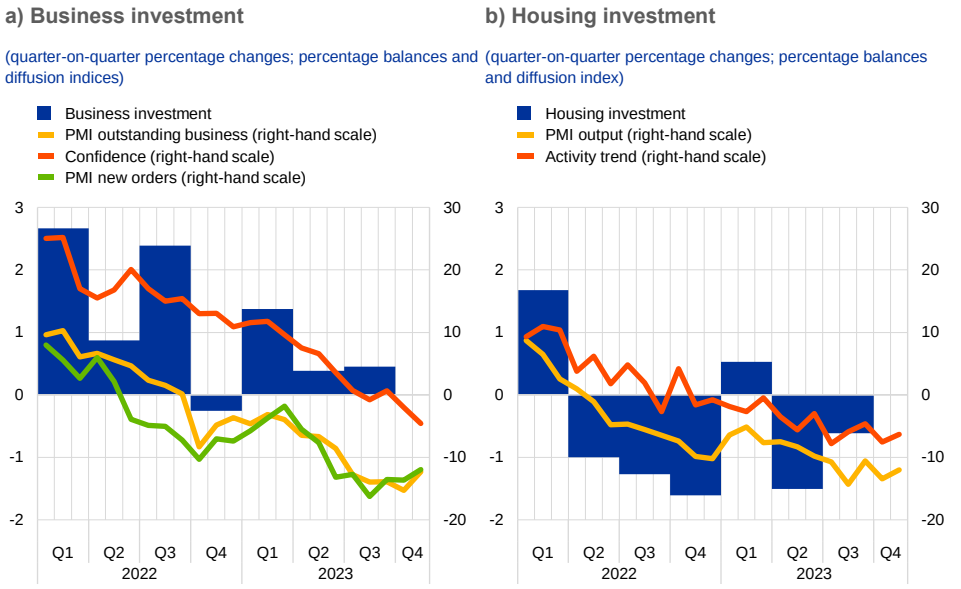
Business investment grew in the third quarter of 2023 but is expected to contract in the fourth quarter. Non-construction investment excluding Irish intangibles grew by 0.5% quarter on quarter in the third quarter of 2023, driven by rises in investment both in intangibles and in machinery and equipment (Chart 8, panel a). In the fourth quarter the continued weakness reflected in the European Commission's confidence survey and in the PMIs for output and new orders suggests a fall in investment. Firms are also being affected by negative corporate net interest income and the support from backlogs continues to wane.[5] The Commission's survey on limits to the production of capital goods in the fourth quarter confirmed weakening demand along with increasingly fewer impediments caused by shortages of equipment and capacity. The latter is in line with a decline in capacity utilisation in the wider economy, suggesting little need for investment to extend production capacity in the near term. Nevertheless, investment is expected to gradually recover in 2024 and beyond as demand picks up again, uncertainty recedes and as the current dampening effect of monetary policy tightening and adverse credit supply conditions fades over the medium term. In addition, the implementation of the Next Generation EU programme should crowd in private investment.

4 The subdued outlook for private consumption may also reflect consumers' pessimistic assessment of recent developments in real income. See the box entitled "A primer on measuring household income" in this issue of the Economic Bulletin.

5 See the box entitled "Net interest income of households and firms" in this issue of the Economic Bulletin.

Chart 8

Real investment dynamics and survey data



Sources: Eurostat, European Commission, S&P Global Market Intelligence and ECB calculations.
Notes: Lines indicate monthly developments, while bars refer to quarterly data. The PMIs are expressed in terms of the deviation from 50. In panel a), business investment is measured by non-construction investment excluding intangibles in Ireland. The lines refer to responses from the capital goods sector, with confidence taken from the European Commission survey. In panel b), the lines refer to the building construction sector. "Activity trend" refers to the trend in activity compared with the preceding three months, as measured by the European Commission survey. The latest observations are for the third quarter of 2023 for business and housing investment and November 2023 for all other items.

Housing investment fell again in the third quarter of 2023 and is likely to fall further in the near future. Housing investment decreased by 0.6% quarter on quarter in the third quarter of 2023, following a decline of 1.5% in the second quarter (Chart 8, panel b). Short-term indicators point to a further decline in the fourth quarter. In October and November the European Commission's indicator of building construction activity in the past three months fell below its average for the third quarter, and the PMI for housing output remained well below the no-growth threshold of 50. Housing sentiment, as measured by the Commission's quarterly survey of households' short-term intentions to renovate, buy or build a house, has also fallen slightly in the fourth quarter of 2023. Similarly, according to the CES, households' perceptions of housing as a good investment declined in October. The weak short-term outlook for housing investment is consistent with the generally significant downward trend in residential building permits and is caused by the considerable tightening of financial conditions which is weighing on housing demand. Household borrowing for housing loans was once again muted in October, suggesting that a recovery in housing demand is not yet in sight.

Export growth remained subdued in the third quarter of 2023, reflecting weak global demand, the lagged impact of the appreciation of the euro and high energy prices. The third quarter once again saw negative quarterly growth in export volumes as weak global trade dampened foreign demand for euro area goods. In addition, the lagged impact of the trade-weighted appreciation of the euro since late 2022 has weakened euro area competitiveness, and high energy prices further contributed to export weakness, especially in energy-intensive sectors. The

contraction in imports of goods in the third quarter was consistent with the weakness in domestic demand and shrinking inventories. As a result, the contribution of net trade to GDP growth was marginally positive in the third quarter. Looking ahead, survey-based indicators point to continued near-term weakness in euro area exports as new export orders for both manufactured goods and services remain in contractionary territory.

Beyond the near term euro area activity is expected gradually to recover, supported by increases in real incomes, the waning drag from adverse financing conditions and improvements in foreign demand. Barring further shocks, GDP growth is expected to gradually strengthen as consumption is increasingly supported by receding inflationary pressures and resilient labour income growth, on the back of continued strong wage growth. Furthermore, the dampening effects of recent adverse financing conditions on investment will fade, and improvements in foreign demand should support a recovery of euro area export growth.

The December 2023 Eurosystem staff projections for the euro area foresee annual real GDP growth slowing to 0.6% in 2023, before picking up to 0.8% in 2024, before rising to 1.5% in 2025 and 2026. Compared with the September 2023 ECB staff projections, the outlook for GDP growth has been revised down slightly for 2023 and 2024, but it is unrevised for 2025.[6]

6 See "Eurosystem staff macroeconomic projections for the euro area, December 2023".

3 Prices and costs

Euro area headline inflation stood at 2.4% in November 2023, down from 2.9% in October, but is likely to pick up again temporarily in the near term on account of upward base effects from energy prices. Inflation excluding energy and food dropped to 3.6% in November, and all indicators of underlying inflation continued to decline in October. However, domestic price pressures remained elevated, primarily owing to strong growth in unit labour costs. Most measures of longer-term inflation expectations stand at around 2%, with some market-based indicators of inflation compensation dropping from elevated levels, mainly on account of lower inflation risk premia. The December 2023 Eurosystem staff macroeconomic projections for the euro area foresee that headline inflation will decline gradually, averaging 2.7% in 2024, 2.1% in 2025 and 1.9% in 2026.

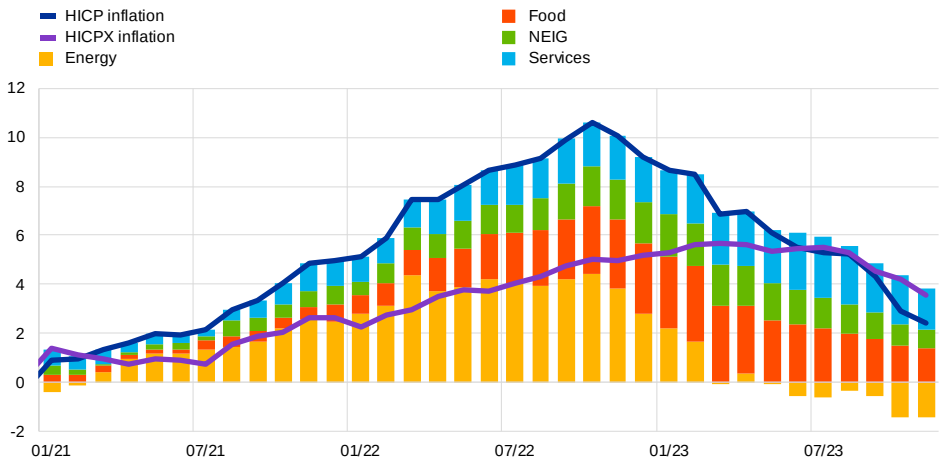
According to Eurostat's flash estimate, HICP inflation fell further to 2.4% in November, down from 2.9% in October (Chart 9).[7] This decline resulted from lower inflation rates for all main subcomponents, namely energy, food, non-energy industrial goods (NEIG) and services. Energy inflation slipped further into negative territory, falling from -11.2% in October to -11.5% in November, reflecting a month-on-month decrease of 2.2%. Food inflation also continued to fall, down from 7.4% in October to 6.9% in November, but still remained high. This decrease reflected a lower annual rate of change in processed food prices. By contrast, the annual rate of change in unprocessed food prices rose, fuelled by a large month-on-month increase and an upward base effect. HICP inflation excluding energy and food (HICPX) declined further to 3.6% in November, down from 4.2% in October, owing to a decrease in both of its main components, NEIG and services. NEIG inflation fell from 3.5% in October to 2.9% in November, reflecting the continued easing of pipeline price pressures. Services inflation decreased from 4.5% in October to 4.0% in November.

7 The cut-off date for data included in this issue of the Economic Bulletin was 13 December 2023. Eurostat's final release on 19 December 2023 confirmed euro area HICP inflation at 2.4% in November.

Chart 9

Headline inflation and its main components

(annual percentage changes; percentage point contributions)



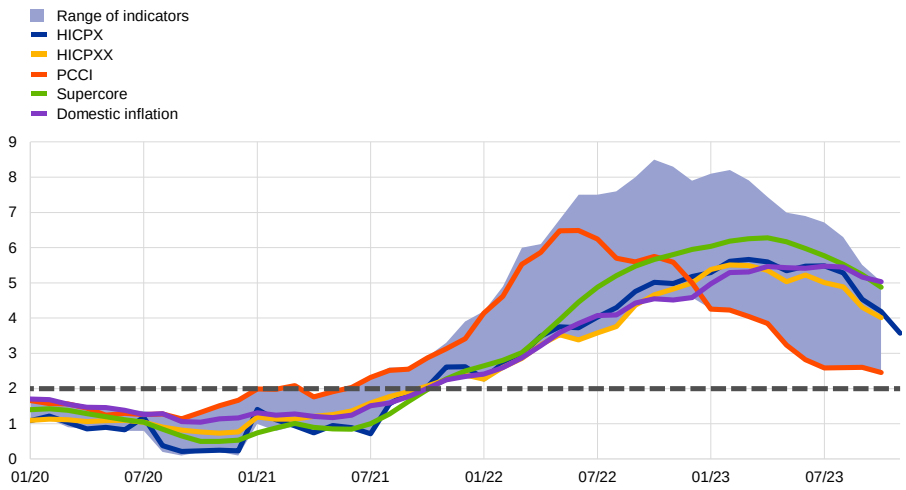
Sources: Eurostat and ECB calculations.
Note: The latest observations are for November 2023 (flash estimate).

All indicators of underlying inflation continued to decrease in October according to the latest available data, reflecting the fading effects of previous shocks to energy costs and supply chains, as well as weaker demand amid tighter monetary policy (Chart 10). Despite declines in all indicators of underlying inflation, uncertainty surrounding underlying inflation dynamics remains high. This is clear from the wide range of rates across measures of underlying inflation, ranging from 2.5% for the Persistent and Common Component of Inflation (PCCI) to 5.0% for domestic inflation. This shows that, for most measures, it takes time for the impact of past shocks to fully fade. The Supercore indicator, which comprises HICP items that are sensitive to the business cycle, declined from 5.2% in September to 4.9% in October, while the model-based PCCI measure moderated only slightly, down from 2.6% to 2.5% over the same period. The indicator for domestic inflation (excluding items with a large import content) has been the most persistently high, sitting at 5.2% in September and 5.0% in October, reflecting the importance of wage pressures. Nevertheless, this indicator has now declined for three consecutive months.

Chart 10

Indicators of underlying inflation

(annual percentage changes)



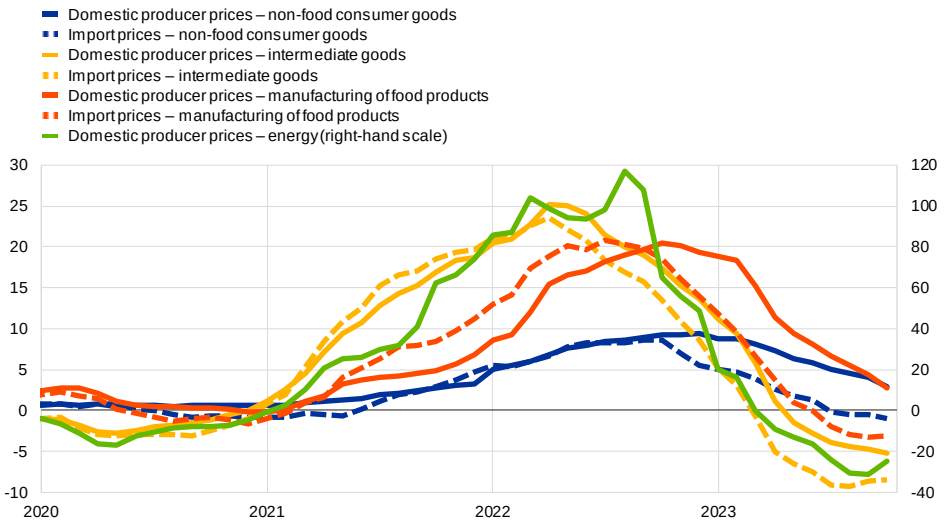
Sources: Eurostat and ECB calculations.
Notes: The range of indicators of underlying inflation includes HICP excluding energy, HICP excluding energy and unprocessed food, HICP excluding energy and food (HICPX), HICP excluding energy, food, travel-related items, clothing and footwear (HICPXX), domestic inflation, 10% and 30% trimmed means, PCCI and a weighted median. The grey dashed line represents the ECB's inflation target of 2% over the medium term. The latest observations are for November 2023 (flash estimate) for HICPX and October 2023 for the remaining items.

Pipeline pressures continued to ease as the cumulative effects of past shocks further dissipated (Chart 11). At the early stages of the pricing chain, price pressures continued to decrease moderately in October. The growth rate in domestic producer prices for intermediate goods has been negative since May, declining further to -5.3% in October, down from -4.8% in September, while import price inflation for intermediate goods continued to fall at a fast pace, but edged up from -8.7% to -8.4% over the same period. Producer price inflation for energy, which has been negative since April, increased to -25.0% in October, up from -31.2% in September. At the later stages of the pricing chain, domestic producer price inflation for non-food consumer goods declined to 3.0% in October, down from 3.9% in September, confirming the ongoing gradual easing of accumulated pipeline pressures. The same is true for pipeline pressures in the consumer food segment, with producer price inflation for manufactured food declining further in October to 2.8%, its lowest level since April 2021. The annual growth rate of import prices for these consumer goods categories remained negative. Import price growth for non-food consumer goods declined from -0.6% in September to -1.0% in October, while for food products it did not moderate further.

Chart 11

Indicators of pipeline pressures

(annual percentage changes)



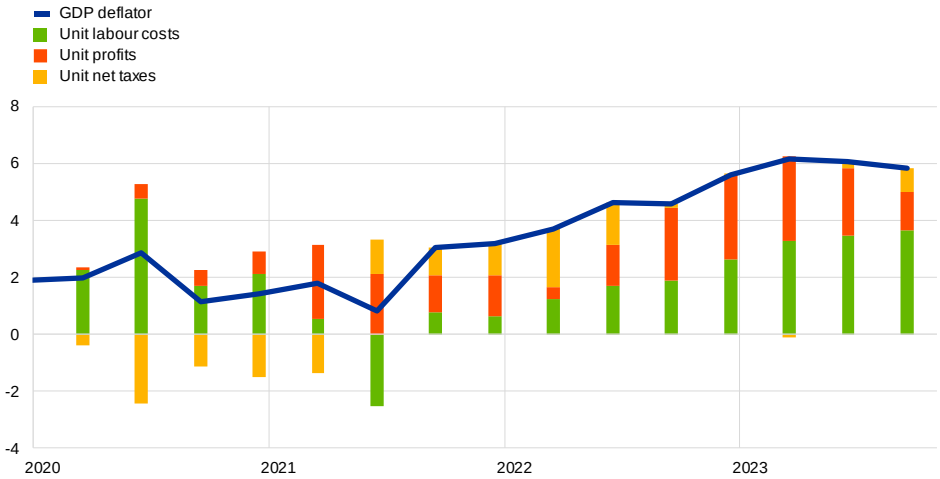
Sources: Eurostat and ECB calculations.
Note: The latest observations are for October 2023.

Domestic cost pressures, as measured by growth in the GDP deflator, decreased to 5.8% in the third quarter of 2023, down from 6.1% in the previous quarter, owing to a smaller contribution from unit profits (Chart 12). The contribution of unit profits to the GDP deflator declined to 1.4 percentage points in the third quarter of 2023, down from 2.4 percentage points in the previous quarter, suggesting that profits started to buffer the inflationary pressures of wages and labour costs. The contribution of unit labour costs rose marginally in the third quarter to 3.6 percentage points, up from 3.5 percentage points in the previous quarter. The slightly stronger annual growth in unit labour costs in the third quarter reflects a more negative growth rate for labour productivity, while wage growth as measured in compensation per employee edged downwards from 5.5% in the second quarter to 5.2% in the third quarter. Wage growth, as measured in terms of compensation per hour, was unchanged at 5.2%, suggesting that strong labour cost pressures are continuing. Underlying these dynamics, negotiated wage growth continued to strengthen in the third quarter of 2023, standing at 4.7%, up from 4.4% in the previous quarter. Moreover, information from recently concluded wage negotiations continues to signal high wage pressures going forward and does not yet show clear signals of a turning point in negotiated wage growth.

Chart 12

Breakdown of the GDP deflator

(annual percentage changes; percentage point contributions)

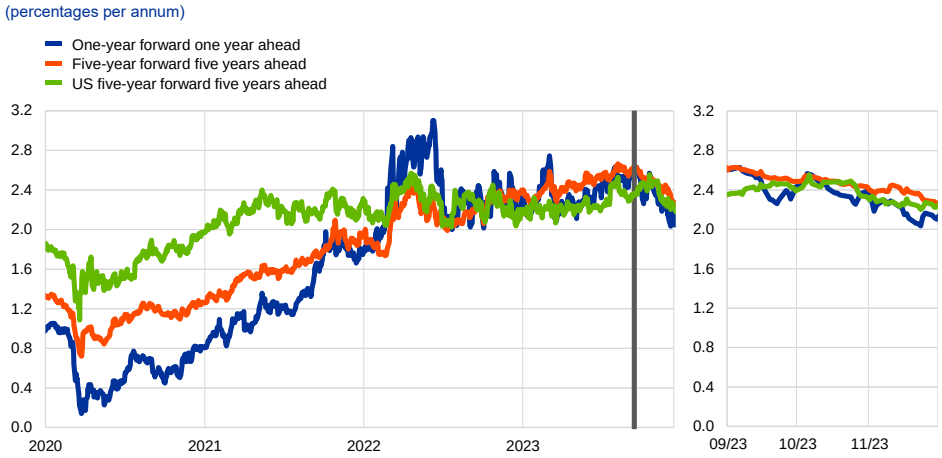


Sources: Eurostat and ECB calculations.
Notes: The latest observations are for the third quarter of 2023. Compensation per employee contributes positively to changes in unit labour costs and labour productivity contributes negatively.

Survey-based measures of longer-term inflation expectations remained at around 2%, while market-based measures of inflation compensation decreased. In both the ECB Survey of Professional Forecasters for the fourth quarter of 2023 and the December 2023 ECB Survey of Monetary Analysts, the median longer-term expectations stood at 2.0%. Market-based measures of inflation compensation (based on HICP excluding tobacco) have fallen markedly since the September meeting of the ECB's Governing Council, especially for near-term maturities, as lower than anticipated inflation readings for September, October and November, along with the subdued growth outlook, prompted market participants to revise their inflation outlook downwards (Chart 13). The one-year forward inflation-linked swap rate one year ahead fell by around 50 basis points to 2.1%. At the longer end, the five-year forward inflation-linked swap rate five years ahead dropped by around 35 basis points to 2.3%, down from the multi-year peak it reached in early August, while remaining high by historical standards. It should, however, be noted that these market-based measures of inflation compensation are not a direct gauge of the genuine inflation expectations of market participants, as these measures include inflation risk premia, which compensate for inflation risks. Model-based estimates of genuine inflation expectations, excluding inflation risk premia, decreased moderately over the review period and indicate that market participants also expect inflation to be around 2% in the longer term. On the consumer side, the October 2023 ECB Consumer Expectations Survey reported that median expectations for headline inflation over the next year remained unchanged at 4.0%. Similarly, inflation expectations for three years ahead plateaued at 2.5%.

Chart 13

Market-based measures of inflation compensation



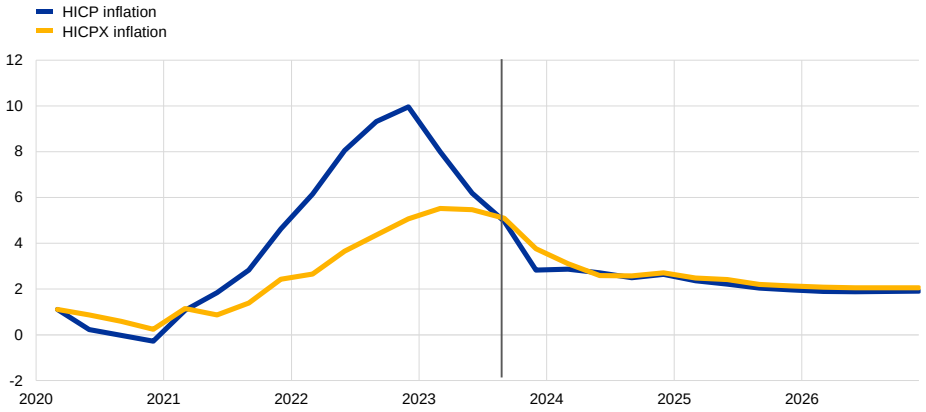
Sources: Refinitiv, Bloomberg and ECB calculations.
Notes: The chart shows forward inflation-linked swap rates over different horizons for the euro area and the five-year forward breakeven inflation rate five years ahead for the United States. The vertical grey line denotes the start of the review period on 14 September 2023. The latest observations are for 13 December 2023.

The December 2023 Eurosystem staff macroeconomic projections foresee headline inflation declining, from an average of 5.4% in 2023 to 2.7% in 2024, 2.1% in 2025 and 1.9% in 2026 (Chart 14). This disinflationary path towards the 2% target reflects the decrease in energy inflation, the impact of monetary policy tightening, the continued fading of pipeline pressures and supply bottlenecks, and the fact that longer-term inflation expectations remain anchored. Wage growth is expected to ease over the projection horizon as the upward impacts from inflation compensation gradually fade, but labour costs are still becoming the dominant driver of HICPX inflation. Profits are set to weaken over the projection horizon and provide a buffer to the pass-through of labour costs. Compared with the September 2023 projections, the projections for headline inflation have been revised downwards for both 2023 and 2024, by 0.2 and 0.5 percentage points respectively, mainly resulting from recent data outturns that were lower than expected and lower assumptions for energy commodity prices. However, projections for headline inflation for 2025 remain unrevised.

Chart 14

Euro area HICP and HICPX inflation

(annual percentage changes)



Sources: Eurostat and the December 2023 Eurosystem staff macroeconomic projections for the euro area.
Notes: The vertical line indicates the start of the projection horizon. The latest observations are for the third quarter of 2023 for the data and the fourth quarter of 2026 for the projections. The December 2023 Eurosystem staff macroeconomic projections were finalised at the end of November, and the cut-off date for the technical assumptions was 23 November 2023. Both historical and actual data for HICP and HICPX inflation are at quarterly frequency.

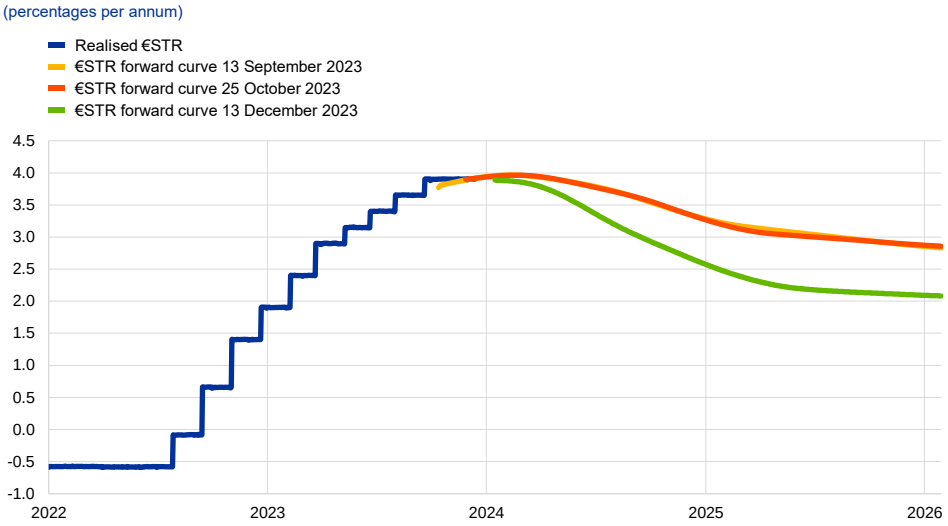
4 Financial market developments

During the period from 14 September to 13 December 2023 financial market developments were dominated by spillovers from substantial fluctuations in US Treasury yields and lower than anticipated inflation releases in the euro area. Euro area policy rate expectations for the next Governing Council meetings, as priced into short-term risk-free rates, remained broadly stable between the September and October meetings. This indicated that market participants expected policy rates to have peaked and to stay unchanged for some time. After the October meeting, policy rate expectations shifted markedly lower as softer than expected inflation readings gave rise to expectations that disinflation might proceed faster than previously thought. Longer-term risk-free rates initially moved higher, as increases in US rates of equivalent maturities spilled over to the euro area. Later, these moves reversed, as US rates fell back and euro area inflation readings came in below expectations. Overall, euro area nominal long-term risk-free rates are markedly lower than before the September meeting. Sovereign bond yields fell about one-for-one with risk-free rates and rather uniformly across the euro area. Prices of risky assets initially fell, weighed down by higher discount rates. However, these more than recovered as rates fell back, to stand higher overall than at the time of the September meeting. Finally, in foreign exchange markets the euro depreciated slightly in trade-weighted terms.

The overnight index swap (OIS) forward curve remained broadly unchanged between the September and October Governing Council meetings, but has since shifted markedly downwards (Chart 15). The benchmark euro short-term rate (€STR) averaged 3.9% over the review period. It closely followed the deposit facility rate, which the Governing Council raised by 25 basis points (from 3.75% to 4%) at its monetary policy meeting on 14 September 2023. Excess liquidity decreased by around €79 billion to stand at €3,584 billion. This mainly reflected repayments of the third series of targeted longer-term refinancing operations (TLTRO III) and the decline in the asset purchase programme (APP) portfolio, as the Eurosystem no longer reinvests the principal payments from maturing securities. The €STR-based OIS forward rates that span the next Governing Council meetings were largely stable between the September and October meetings. This indicated that market participants expected the hiking cycle to have peaked with the September hike and policy rates to remain at the current levels for some time. In the period after the October meeting forward rates shifted markedly downwards, as lower than expected euro area inflation numbers, combined with the subdued growth outlook, led to a reassessment of the inflation outlook. The forward curve on 13 December was pricing in the first full cut of 25 basis points in the spring of 2024, a significant likelihood of a cut as soon as the March meeting, as well as about 140 basis points of cumulative cuts in the course of 2024.

Chart 15

€STR forward rates

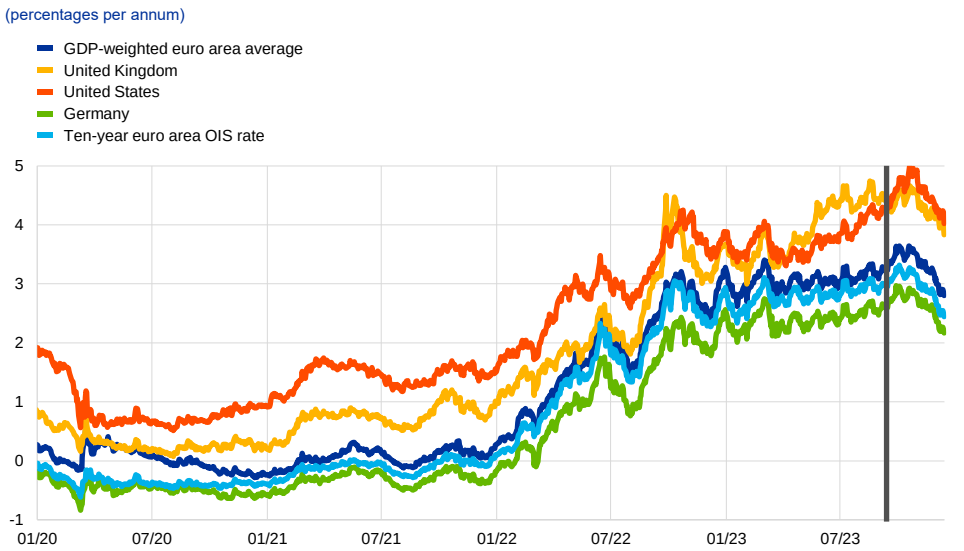


Sources: Thomson Reuters and ECB calculations.
Note: The forward curve is estimated using spot OIS (€STR) rates.

Euro area long-term risk-free rates have fluctuated noticeably, largely mirroring moves in long-term US Treasury yields, and are ultimately markedly lower than before the September meeting (Chart 16). Early in the review period, long-term risk-free rates rose substantially: the ten-year euro OIS rate stood about 30 basis points higher in mid-October than on the day before the September meeting. The main driver behind this increase appeared to be spillovers from the United States, where the rise in long-term rates was stronger than in the euro area. Subsequently, the increase in long-term euro area risk-free rates more than reversed, as US Treasury yields came off their peak, euro area inflation readings surprised on the downside, and the economic outlook deteriorated. The ten-year euro OIS rate ultimately stood about 50 basis points below its mid-September level at around 2.4%. The US ten-year Treasury yield was down by about 25 basis points, at 4.0%, after having increased by more than 70 basis points early on in the review period, while the UK equivalent fell about 45 basis points to around 3.8%.

Chart 16

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

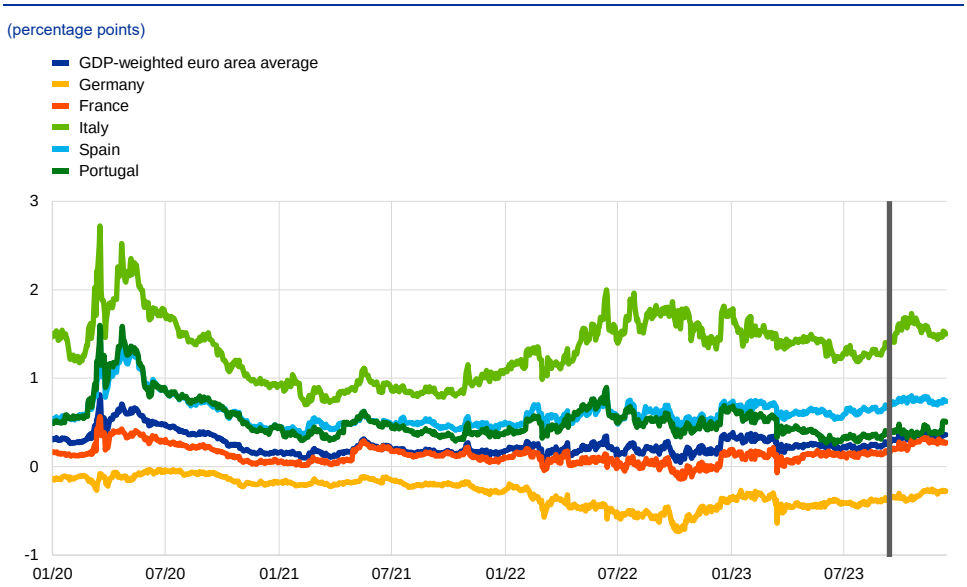


Sources: Refinitiv and ECB calculations.
Notes: The vertical grey line denotes the start of the review period on 14 September 2023. The latest observations are for 13 December 2023.

Euro area sovereign bond yields decreased almost in lockstep with, and by similar magnitudes to, risk-free rates – leaving sovereign spreads little changed (Chart 17). The ten-year GDP-weighted euro area sovereign bond yield was about 40 basis points lower at around 2.8%. Over the review period there was only a slight increase in the GDP-weighted euro area average sovereign bond spread over the OIS rate based on the €STR. Sovereign bond spreads in most euro area jurisdictions evolved similarly. An exception was the Greek sovereign bond spread, which decreased by 10 basis points as the Greek sovereign credit ratings were raised to investment grade. After having risen earlier in the review period, the Italian sovereign spread subsequently reversed most of the increase as rating agencies confirmed their ratings for Italy.

Chart 17

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



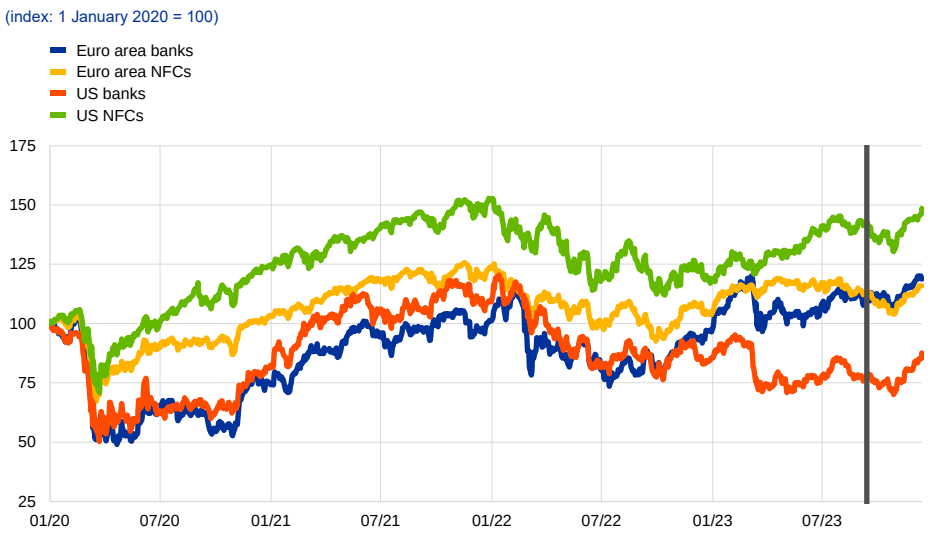
Sources: Refinitiv and ECB calculations.
Notes: The vertical grey line denotes the start of the review period on 14 September 2023. The latest observations are for 13 December 2023.

Corporate bond spreads remained broadly unchanged over the review period, amid positive risk sentiment. Spreads on high-yield corporate bonds followed the movements in long-term interest rates, increasing significantly over the first half of the review period and subsequently declining. Spreads on investment-grade corporate bonds, by contrast, fluctuated only moderately over the period. These developments are consistent with the credit risk pricing for lower-rated corporations being more sensitive to interest rate changes. Yet taking a longer perspective – namely since the start of the monetary policy normalisation in December 2021 – corporate bond spreads have increased only moderately. The resilience of the euro area corporate sector has helped to contain bond funding costs.

Euro area equity prices rose over the review period as a persistent rally in November more than made up for the losses accumulated earlier (Chart 18). Over the review period as a whole, euro area stock market indices increased by 4.3%. Since November they have made up the losses accumulated up to the end of October. Market sentiment was initially weak, as long-term rates and geopolitical uncertainty weighed on equity performance, but it later recovered as the equity risk premium decreased and interest rates fell back. The banking sector outperformed and gained 6.0%, as its stock market valuation continued to benefit from the distribution of profits to shareholders. By contrast, equity prices for non-financial corporations (NFCs) increased by only 2.6%, though displaying considerable sectoral heterogeneity. Interest rate-sensitive sectors such as technology and real estate experienced some of the largest price changes over the review period. Equity performance in the United States followed a similar trajectory, with the broad-based index increasing by 4.5% and the banking sector outperforming non-financial corporations.

Chart 18

Euro area and US equity price indices



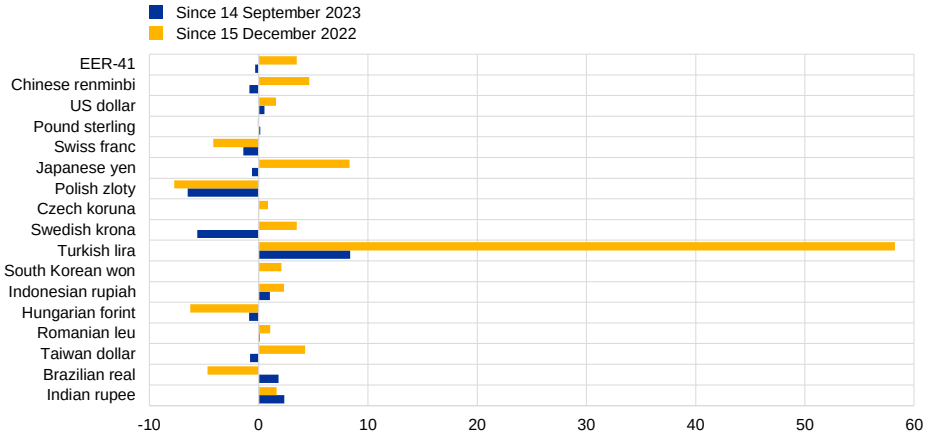
Sources: Refinitiv and ECB calculations.
Notes: The vertical grey line denotes the start of the review period on 14 September 2023. The latest observations are for 13 December 2023.

In foreign exchange markets, the euro depreciated slightly in trade-weighted terms (Chart 19). 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 – depreciated by 0.3%. The moderate depreciation of the euro masks some intra-period fluctuations reflecting changes in market participants' expectations about policy rates – particularly in the United States. In terms of bilateral exchange rate movements against major trading partners' currencies, the euro weakened against the Chinese renminbi (by 0.9%), the Swiss franc (by 1.4%) and against the currencies of some non-euro area EU Member States (by 6.5% against the Polish zloty and 5.6% against the Swedish krona). By contrast, the euro appreciated against the Indian rupee (by 2.3%), the Turkish lira (by 8.4%) as well as against the US dollar (by 0.5%). The latter appreciation reflected the pricing out of expectations of the Federal Reserve keeping policy rates on hold for an extended period of time. Furthermore, a lower-than-expected US CPI print in mid-November provided additional support to the euro, despite being partly offset by the subsequent euro area HICP release which also came in below expectations.

Chart 19

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

(percentage changes)



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 13 December 2023.

5 Financing conditions and credit developments

The transmission of the ECB's monetary policy tightening to broader financing conditions has remained strong. In October 2023 bank funding costs and bank lending rates increased further, reaching their highest levels in almost 15 years for both firms and households. In the same month, the overall cost of financing for non-financial corporations (NFCs) also edged up higher. Over the period from 14 September to 13 December 2023, the cost to NFCs of both market-based debt and equity financing declined significantly. The latest Survey on the Access to Finance of Enterprises, covering the period from April to September 2023, indicates a broad-based tightening of financing conditions for firms. The weakness in bank lending to firms and households continued in October, reflecting higher lending rates, lower loan demand and tighter credit standards. Money growth continued to contract, with annual rates close to historical lows, owing to high opportunity costs, subdued credit growth and the reduction in the Eurosystem balance sheet.

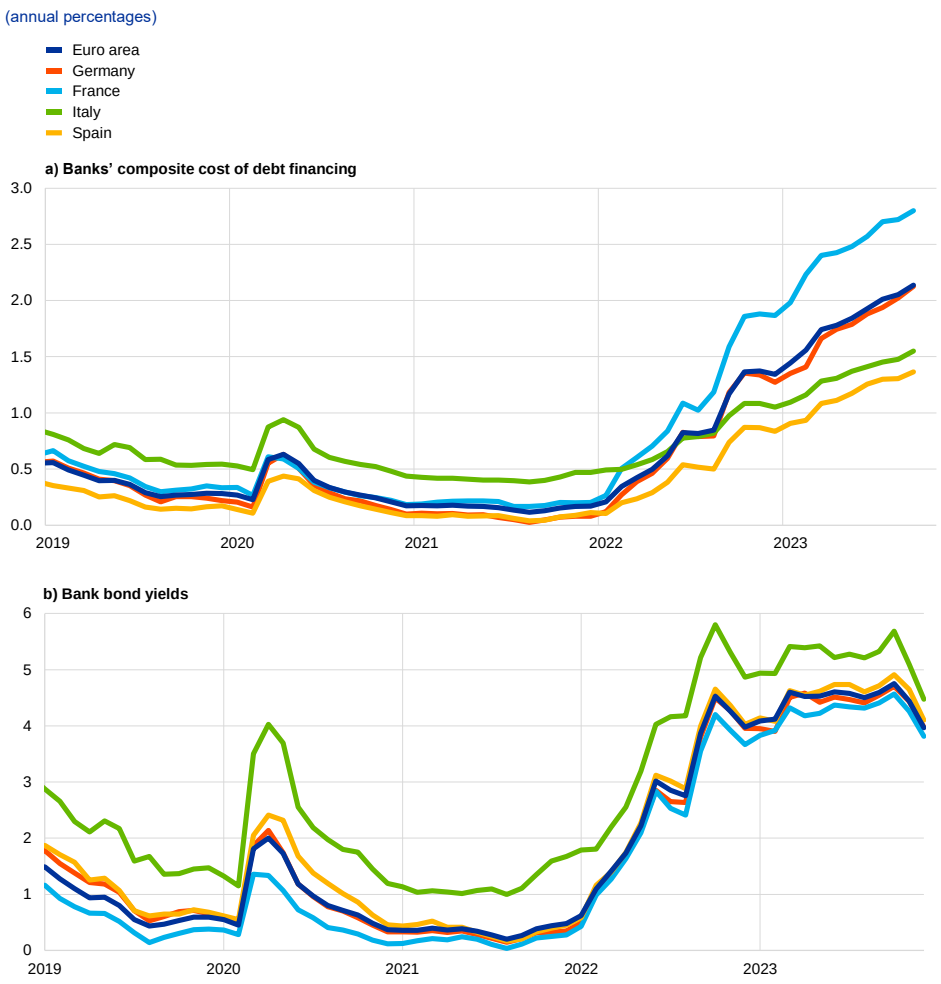
Euro area bank funding costs continued to rise in October 2023, driven by further increases in deposit rates. The composite cost of debt financing for euro area banks rose in October, reaching its highest level in more than ten years and showing greater cross-country heterogeneity (Chart 20, panel a). While bank bond yields started to decrease in November, mirroring developments in the yield curve (Chart 20, panel b), deposit rates continued to rise steadily, with some variation across instruments and sectors. The large and widening spread between time and overnight deposit rates led depositors to shift large volumes of their overnight holdings to time deposits and other instruments with higher remuneration. The rates offered to firms for holding time deposits were close to the ECB's deposit facility rate and remained above those for households. In addition, the pass-through of policy rates to deposit rates has continued to vary significantly across banks, mainly reflecting differences arising from competition, the duration of banks' assets and liabilities, and regulatory arrangements.

The ongoing phasing-out of targeted longer-term refinancing operations (TLTROs) has contributed to a reduction in excess liquidity in an environment of still ample system-wide liquidity. Following the settlement on 20 December 2023, the overall outstanding amount of funds under the third series of TLTROs (TLTRO III) has been reduced by €1.721 trillion, down to €392 billion. This figure is 81% below the amount outstanding before the October 2022 recalibration of the TLTRO III remuneration (€2.113 trillion).[8] To make up for the lower liquidity provided by the ECB, banks have increased their issuance of debt securities and money market instruments, and competed more actively with each other for deposits by increasing the remuneration on these instruments. Savers have moved deposits from banks offering less attractive remuneration to those that have raised their deposit rates at a faster pace. Issuance of bank bonds, which are more expensive for banks than deposits, has increased in volume since September 2022, amid the winding-down of TLTROs and the decline in overnight deposits.

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

Chart 20

Composite bank funding costs in selected euro area countries



Sources: ECB, S&P Dow Jones Indices LLC and/or its affiliates, and ECB calculations.
Notes: Composite bank funding costs 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 October 2023 for banks' composite cost of debt financing and 13 December 2023 for bank bond yields.

Bank balance sheets have been robust overall, despite a weak economic environment. In the first half of 2023 banks continued to increase their capitalisation and maintained capital ratios well above the Common Equity Tier 1 (CET1) requirements. A well-capitalised banking system is key to ensuring the sustainable provision of credit to the real economy under adequate conditions. Despite rising bank funding costs, lower lending volumes and worsening asset quality, bank profitability benefited from higher net interest rate margins, amid considerable cross-country heterogeneity. The increase in net interest income was particularly evident for banks in countries where variable-rate lending predominates and where the increase in bank funding costs has been smaller. Bank non-performing loans remained at low levels in the second quarter of 2023, but default rates on both corporate and retail exposures have already started to rise, pointing to further increases in non-performing loans. Banks may face the risk of higher provisioning

costs if risks to the non-financial sectors materialise as a result of weaker than anticipated economic conditions.

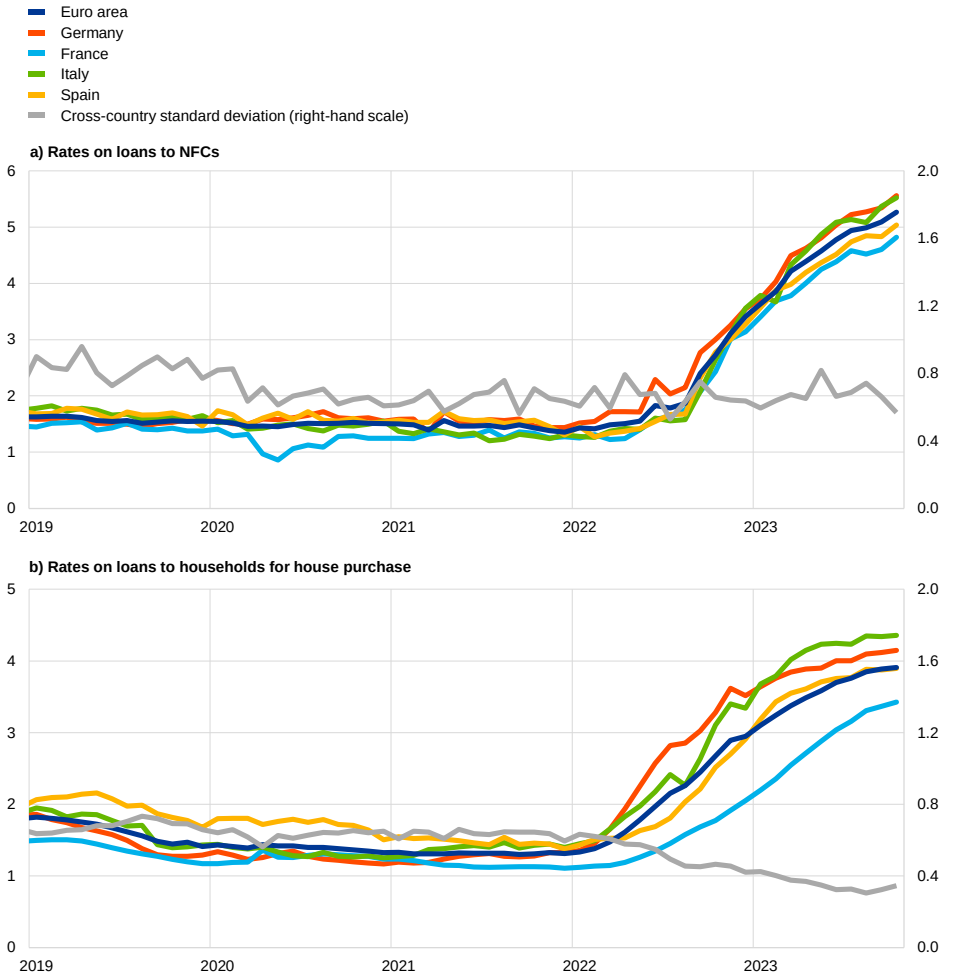
In October 2023 lending rates for firms and households increased further, reflecting higher ECB policy rates and tighter credit standards. Between early July 2022 and September 2023, the ECB's policy rates rose substantially and rapidly, by a total of 450 basis points. This has led to a sharp increase in lending rates for both firms and households across euro area countries (Chart 21). Bank rates on new loans to NFCs and households have reached their highest level in almost 15 years, amid decreasing loan origination and tightening credit standards. Since May 2022, i.e. before the ECB signalled the first rate hike in the current tightening cycle, lending rates for firms and for households for house purchase have risen by around 350 basis points and 210 basis points respectively. In October 2023 lending rates for firms rose to 5.27%, compared with 5.09% in September. This increase was widespread across interest rate fixation periods and was the largest for fixation periods of between one and five years. Bank rates on new loans to households for consumption were broadly unchanged, standing at 7.90% in October. Lending rates on new loans in the category "other lending to households", which includes sole proprietors, increased to 5.55% in October, up from 5.38% in September. Lending rates on new loans to households for house purchase rose only slightly, standing at 3.91% in October, compared with 3.89% in September. This slower rate of increase reflects the advanced stage of the tightening cycle and increasing volumes of renegotiated loans that have pushed down rates on new loans in some euro area countries.[9] It was also stronger for flexible-rate mortgages than for fixed-rate contracts, amid cross-country heterogeneity. The results of the ECB's Consumer Expectations Survey for October 2023 suggest that consumers expect mortgage rates to stabilise somewhat above the current levels over the next 12 months. A large net percentage of survey respondents perceived credit standards to be tight and expected housing loans to become harder to obtain over that same period. The cross-country dispersion of lending rates remained at a low level for both firms and households (Chart 21, panels a and b).

[9] The purpose of loan negotiations is to make it easier for the borrower to keep up with future payments and to ensure that the lender will eventually be paid back.

Chart 21

Composite bank lending rates for NFCs and households in selected countries

(annual percentages; standard deviation)



Source: ECB.
Notes: Composite bank lending rates for non-financial corporations (NFCs) 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 October 2023.

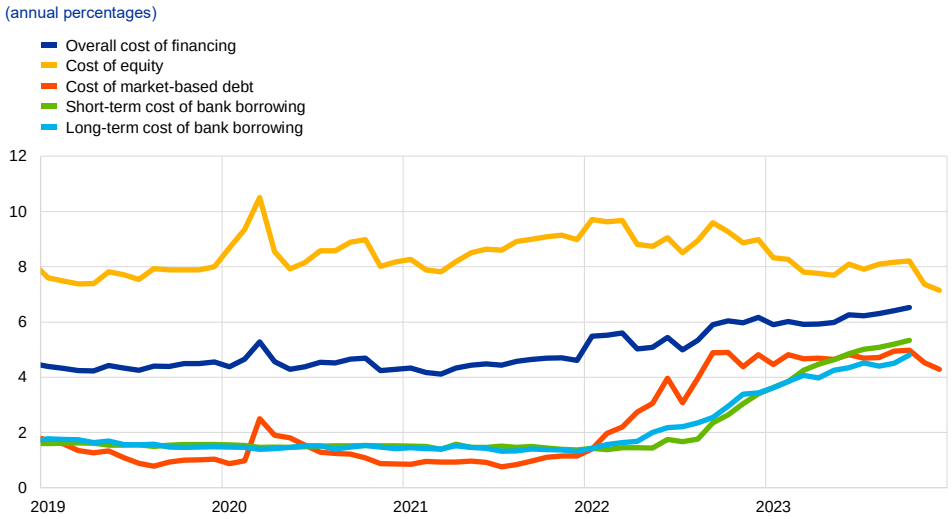
From 14 September to 13 December 2023 the cost to NFCs of both market-based debt and equity financing declined significantly. In October the overall cost of financing for NFCs – i.e. the composite cost of bank borrowing, market-based debt and equity – hit a multi-year high, reaching levels last seen in the second half of 2010, having risen by 11 basis points on the previous month to stand at 6.54% (Chart 22).[10] This increase was due mainly to a rise in the cost of long and short-term borrowing from banks. However, over the review period as a whole – 14 September to 13 December 2023 – the cost of both equity and market-based debt declined. The decline in the cost of equity was driven by the decrease in both the equity risk premium and the long-term risk-free rate (approximated by the ten-year overnight index swap rate). The fall in the cost of market-based debt was almost

[10] Owing to lags in the data available on the cost of borrowing from banks, data on the overall cost of financing for NFCs are only available up to October 2023.

identical to the drop in the risk-free rate given that spreads on bonds issued by non-financial firms remained virtually unchanged (see Section 4).

Chart 22

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



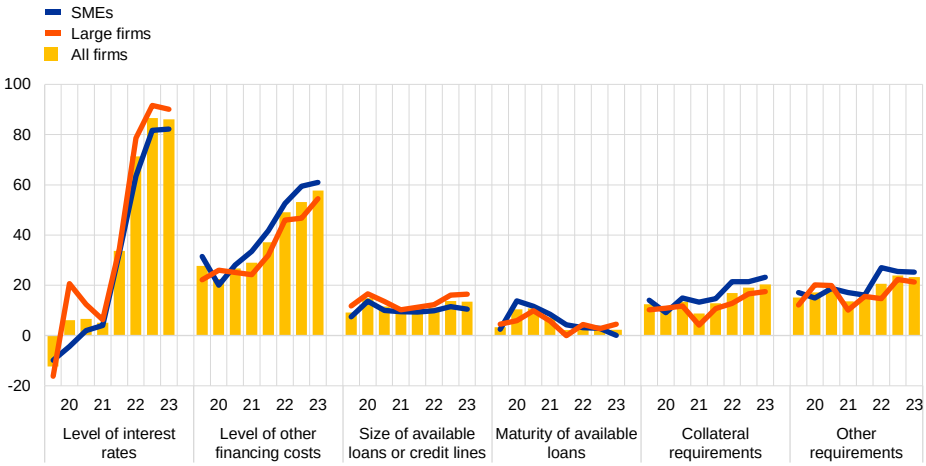
Sources: ECB and ECB estimates, Eurostat, Dealogic, Merrill Lynch, Bloomberg and Thomson Reuters.
Notes: The overall cost of financing for non-financial corporations (NFCs) is based on monthly data and is calculated as a weighted average of the cost of borrowing from banks (monthly average data), market-based debt and equity (end-of-month data), based on their respective outstanding amounts. The latest observations are for 13 December 2023 for the cost of market-based debt and the cost of equity (daily data), and October 2023 for the overall cost of financing and the cost of borrowing from banks (monthly data).

Firms continued to report a widespread increase in bank interest rates and other costs of bank financing over the period from April to September 2023 in the Survey on the Access to Finance of Enterprises**.** A net 86% of firms reported higher bank interest rates in the most recent survey round, compared with 87% in the previous round (Chart 23). At the same time, a historically high net 58% (up from 53%) of firms reported an increase in other costs of financing (i.e. charges, fees and commissions). A rise in bank interest rates was reported more broadly by large firms, whereas an increase in other costs of bank loans was signalled more often by small and medium-sized enterprises (SMEs). In net terms, firms also reported stricter collateral requirements. Despite tighter financing conditions, few firms reported obstacles to obtaining a bank loan.

Chart 23

Changes in the terms and conditions of bank financing for euro area firms

(net percentages of respondents)



Source: ECB Survey on the Access to Finance of Enterprises.
Notes: SMEs stands for small and medium-sized enterprises. The figures are based on firms that had applied for bank loans (including subsidised bank loans), credit lines, or bank or credit card overdrafts. Net percentages are the difference between the percentage of firms reporting an increase for a given factor and the percentage reporting a decrease. The figures refer to rounds 22-29 of the survey (October 2019-March 2020 to April 2023-September 2023).

Firms also reported a further moderate widening in their financing gap and expected the availability of most sources of external financing to deteriorate in the future. In the euro area, the external financing gap – the difference between the change in needs for, and change in availability of, external financing across all financial instruments – was reported to be 8% (up from 6% in the previous survey round). More large firms than SMEs reported an increase in the financing gap, driven by higher financing needs across most instruments. Looking ahead, firms are slightly more pessimistic about the availability of external financing over the next six months. Reflecting the ongoing tightening of bank lending conditions, a net 18% of firms expect a further deterioration in access to bank loans over the next six months, while the corresponding figures for credit lines and debt securities are 15% and 17% respectively. More SMEs than large firms expect a deterioration in access to both bank loans and credit lines. By contrast, the share of firms expecting the availability of debt securities to deteriorate was greater for large firms than for SMEs.

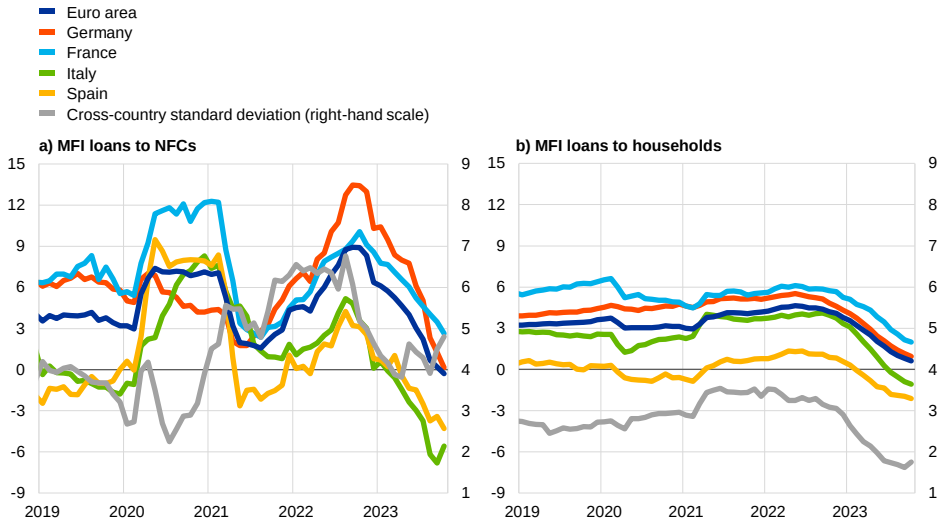
Annual growth in loans to NFCs turned negative in October 2023. This growth rate fell to -0.3% in October, down from 0.2% in September (Chart 24, panel a), amid considerable heterogeneity across countries and maturities. The slowdown reflected the sharp decline in loan demand, which was due in part to higher borrowing rates and associated spending plan cuts, and in loan supply, as suggested by the further tightening of credit standards in the third quarter of 2023. The short-term dynamics remained subdued, as implied by the monthly flows, which were negative, on average, over the three months to October. The annual growth rate of loans to households fell to 0.6% in October, down from 0.8% in September (Chart 24, panel b), amid negative housing market prospects, a further tightening of credit standards and higher lending rates. The decline was driven mainly by housing loans and loans to sole proprietors (i.e. unincorporated small businesses), while consumer loans remained more resilient, despite tightening credit standards and falling consumer

confidence. The short-term dynamics show virtually no new net lending over the past three months.

Chart 24

MFI loans in selected euro area countries

(annual percentage changes; standard deviation)



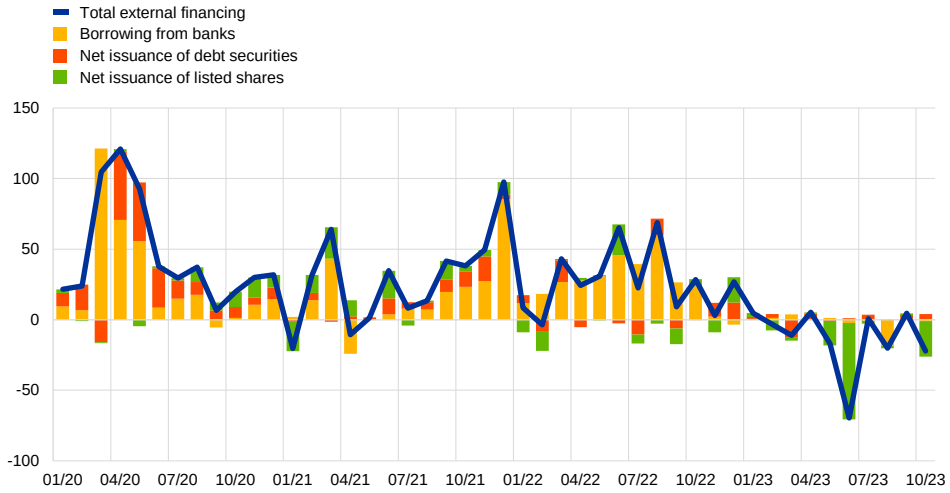
Source: ECB.

Notes: Loans from monetary financial institutions (MFIs) are adjusted for loan sales and securitisation; in the case of non-financial corporations (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 October 2023.

Growth in net external financing of euro area firms was weak in the third quarter of 2023 and in October, reflecting low levels of debt financing. The annual growth rate of net external financing declined from 0.5% in June 2023 to -0.7% in October (Chart 25). Unlike previous episodes of weak loan dynamics, corporate bond issuance did not make up for the decline in bank loans. The issuance of listed shares was muted overall, with firms also engaging in share buybacks to boost shareholder returns.

Chart 25

Net external financing flows for euro area NFCs



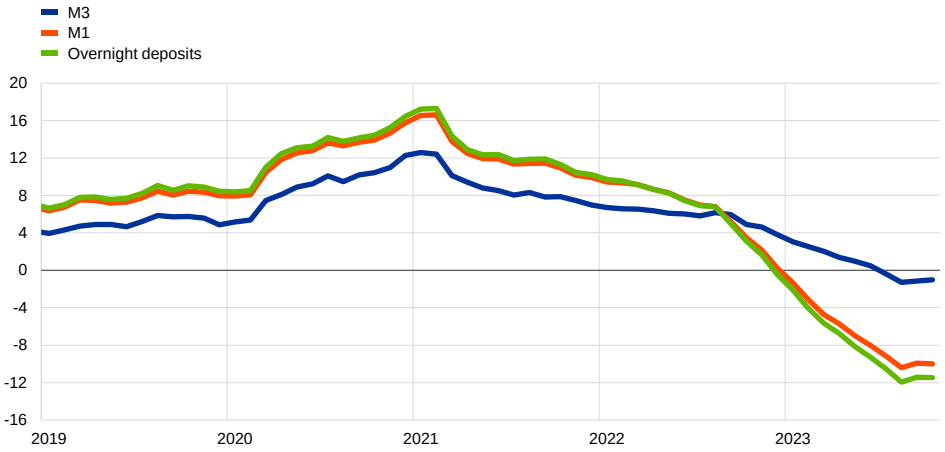
Sources: ECB, Eurostat, Dealogic and ECB calculations.
Notes: Net external financing is the sum of borrowing from banks (MFI loans), net issuance of debt securities and net issuance of listed shares. MFI loans are adjusted for loan sales, securitisation and cash-pooling activities. The latest observations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

The reallocation of overnight deposits to time deposits intensified in October. The annual growth rate of overnight deposits continued its double-digit decline in October, down to -11.5% from -11.4% in September (Chart 26). The rise in interest rates has translated into a large and widening spread between time and overnight deposits given that interest rates on overnight deposits have adjusted to policy rate changes more slowly than those on time deposits, in line with previous tightening cycles. This has pushed up the opportunity cost of holding liquid assets and is driving the ongoing fund reallocation from overnight to time deposits. For households, October saw the largest monthly shift from overnight to time deposits since the start of the tightening cycle. Firms switched between these two instruments at a more rapid pace, as was the case in the first half of 2023.

Chart 26

M3, M1 and overnight deposits

(annual growth rate, adjusted for seasonal and calendar effects)



Source: ECB.
Note: The latest observations are for October 2023.

In October 2023 money growth continued to contract – with annual rates close to recent historical lows – driven by high opportunity costs, subdued credit growth and the reduction in the Eurosystem balance sheet. Annual broad money (M3) growth in the euro area stood at -1.0% in October, up from -1.2% in September (Chart 26). Annual narrow money (M1) growth declined at double-digit rates, with overall contractionary monetary dynamics being reinforced by portfolio shifts. In October it stood at -10.0%, down slightly from -9.9% in September. As in previous months, the Eurosystem's balance sheet reduction and bank bond acquisitions by money holders continued to have a contractionary effect on monetary dynamics. In addition, repayments of TLTRO funds and the higher opportunity cost for depositors of holding liquid assets are leading banks to issue bonds with longer maturities not included in M3. At the same time, monetary dynamics have been increasingly underpinned by purchases of government bonds by banks and foreign investors, thereby bringing new money into the system, and a growing current account surplus leading to higher monetary inflows from the rest of the world.

6 Fiscal developments

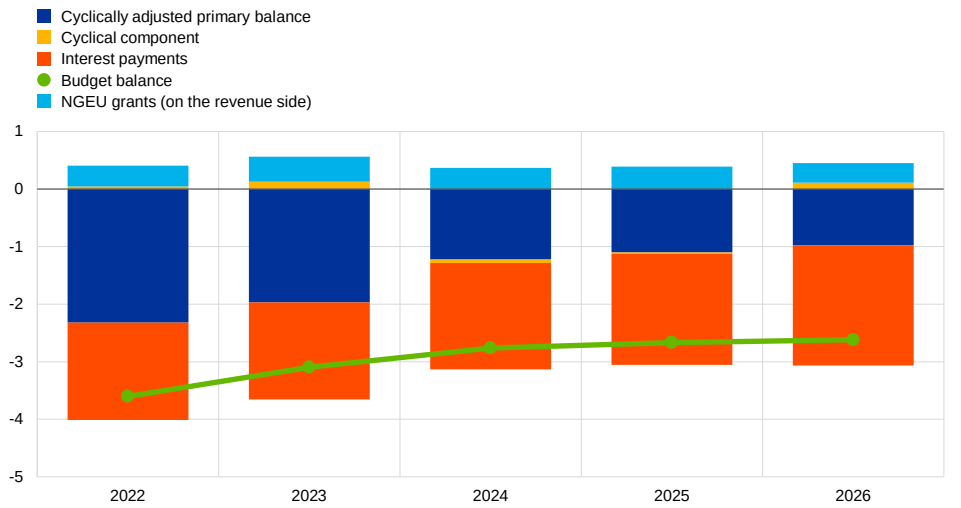
According to the December 2023 Eurosystem staff macroeconomic projections, the euro area general government budget balance is estimated to have improved moderately in 2023 and is expected to also improve moderately in 2024. This would be followed by only marginal further improvements in 2025 and 2026. Broadly reflecting these developments, the euro area fiscal stance is likely to have tightened moderately in 2023 and is expected to tighten more significantly in 2024. Over the subsequent two years, only very minor further tightening is expected. The ratio of euro area debt to GDP is projected to decline only marginally over the projection horizon, from an estimated 89% in 2023 to around 88% in 2026, representing a slowing down of the decline observed since the highs of the pandemic. As the energy crisis fades, governments should continue to roll back the related support measures. This is essential to avoid driving up medium-term inflationary pressures, which would otherwise call for even tighter monetary policy. Fiscal policies should be designed to make the euro area economy more productive and gradually bring down high public debt. It is important that Member States swiftly agree on the reform of the EU's economic governance framework.

According to the December 2023 Eurosystem staff macroeconomic projections, the euro area general government budget balance will improve slowly over the whole projection horizon.[11] According to the projections, the euro area budget deficit is estimated to have declined to 3.1% of GDP in 2023 and will continue declining to 2.8% of GDP in 2024, 2.7% in 2025 and 2.6% in 2026 (Chart 27). This path is expected to be driven primarily by smaller negative cyclically adjusted primary balances, while the cyclical component is expected to be fairly stable over the projection horizon. Interest payments are projected to increase slightly over the projection horizon, but the increase will be moderate compared to that in market interest rates as the pass-through will be gradual owing to long sovereign debt residual maturities, for which the euro area average is currently just below 8 years (up from 6.5 years in 2015). The fall in the cyclically adjusted primary deficit, which is concentrated in 2023 and 2024, is largely driven by the scaling back of government fiscal support measures as the energy shock and high inflation fade. It is now estimated that, at the euro area level, these measures amounted to 1.3% of GDP in 2023, will decline significantly to 0.4% of GDP in 2024 and will decline further to around 0.1% of GDP in 2025 and 2026. This improvement in the cyclically adjusted primary balance is also affected by the recent decision of the German Federal Constitutional Court regarding the use of emergency credits and the impact on the "debt brake". However, uncertainty remains regarding this impact given that the German federal budget for 2024 has not yet been finalised.

[11] See "Eurosystem staff macroeconomic projections for the euro area, December 2023", published on the ECB's website on 14 December 2023.

Chart 27

Budget balance and its components



Sources: ECB calculations and Eurosystem staff macroeconomic projections for the euro area, December 2023.
Notes: The cyclically adjusted primary balance is adjusted for Next Generation EU (NGEU) grants on the revenue side. The data refer to the aggregate general government sector of all 20 euro area countries (including Croatia).

Compared with the September 2023 ECB staff macroeconomic projections, the budget balance is up marginally by 0.1 percentage point in 2023, unchanged in 2024 and up moderately by 0.3 percentage points in 2025. These revisions can be traced back to an upward revision of the cyclical component over the whole projection horizon (by 0.4 percentage points per annum), which in 2023 and 2024 is almost fully offset by a more adverse cyclically adjusted primary balance. In 2025, however, the upward revision of the cyclical component is offset only to a smaller degree. The contribution from interest expenditures remains unchanged over the projection horizon.

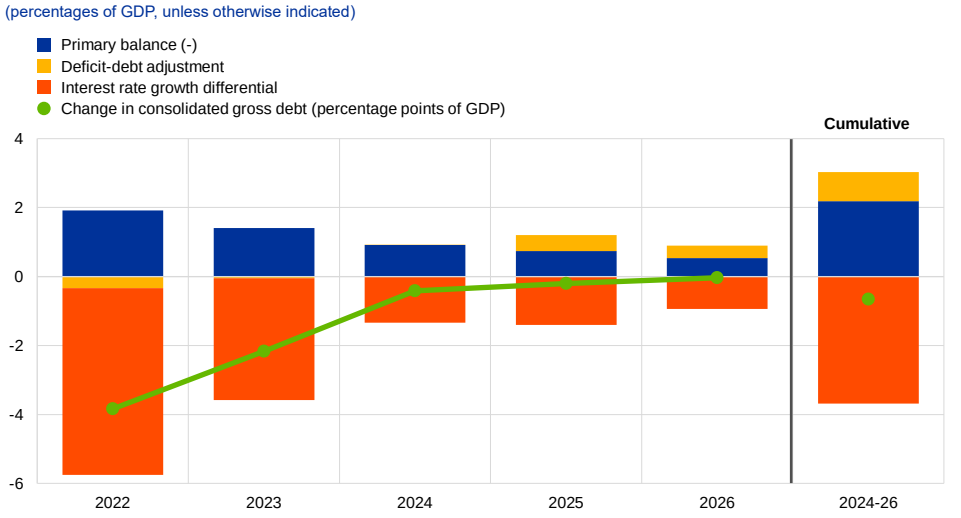
The euro area fiscal stance is projected to tighten moderately over the forecast horizon, most notably in 2024.[12] The annual change in the cyclically adjusted primary balance, adjusted for grants extended to countries under the NGEU programme, points to a significant tightening of fiscal policies in the euro area in 2023 and 2024 taken together as a large share of the energy and inflation support measures introduced in 2022 are phased out. Nonetheless, taking into account past measures, including measures in response to the outbreak of the pandemic in 2020 and, more recently, measures in response to the energy and inflation shock, the level of fiscal support in the euro area is expected to remain largely accommodative over the whole projection horizon. The minor expected tightening of the fiscal stance in 2025 and 2026 does little to change this overall assessment.

12 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 NGEU 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.

The ratio of euro area government debt to GDP is projected to remain above its pre-pandemic level and to decline only slowly from an estimated 88.7% in 2023 to 88.1% in 2026. The debt ratio increased by approximately 13 percentage points to around 97% in 2020 but has gradually fallen since and is expected to continue to fall over the projection horizon, albeit at a significantly slower pace. The projected decline is based on narrowing but still negative differentials between interest rates and nominal GDP growth, which are partly offset by the continuing primary deficits and by expected positive deficit-debt adjustments in the second half of the projection horizon (Chart 28).

Chart 28

Drivers of change in euro area government debt



Sources: ECB calculations and Eurosystem staff macroeconomic projections for the euro area, December 2023.
Note: The data refer to the aggregate general government sector of all 20 euro area countries (including Croatia).

As the energy shock fades, governments should continue to roll back the related support measures. This is essential to avoid driving up medium-term inflationary pressures, which would otherwise call for even tighter monetary policy. In its statement of 7 December, the Eurogroup called on those Member States that still have significant measures in place to phase them out as soon as possible in 2024 and to use the related savings for deficit reduction. The Eurogroup considered that, while policies should remain agile in view of the prevailing uncertainty, an overall restrictive fiscal stance for the euro area in 2024 was appropriate to enhance public finance sustainability and avoid fuelling inflationary pressures. Beyond this, it will be important that fiscal policies are designed to make the euro area economy more productive and gradually bring down high public debt. This can best be achieved within a robust EU framework for economic and fiscal policy coordination and surveillance. In its opinion of 5 July 2023 on a proposal for economic governance reform in the Union, the ECB urged EU legislators to come to an agreement on the

reform of the economic governance framework as soon as possible, and at the latest by the end of 2023.[13]

[13] On 21 December 2023, and thus after the December Governing Council meeting covered by this issue of the Economic Bulletin, the European Council reached agreement on a reform of the EU's economic governance which opens the way for a trialogue between the Commission, the Council and the European Parliament.

Boxes

1 US Treasury market conditions and global market reactions to US monetary policy

Prepared by Magdalena Grothe, Ana-Simona Manu and Peter McQuade

The market for US Treasury securities is the largest and most liquid market for government securities in the world. With over USD 25 trillion of outstanding securities, this market is used to finance the US Government and plays a central role in the implementation of the monetary policy of the US Federal Reserve System. US Treasury securities also act as a key benchmark for both US domestic private sector financing and international markets. As such, changes in liquidity conditions in this market can have noticeable consequences for global financial markets.

Recently, liquidity in the US Treasury market has declined owing to a combination of factors. Chart A (panel a) shows the evolution of bond market liquidity in selected advanced economies, including the US Treasury market, as measured by the "spline spread", which is the average fitting error in a yield curve. This spread serves as a proxy for the extent of arbitrage opportunities in a bond market, with higher values being associated with lower market liquidity.[1] The smooth functioning of the US Treasury market has been challenged on a number of occasions in recent years, particularly in March 2020 at the onset of the pandemic. More recently, monetary policy tightening (including reduced absorption of US Treasuries by the Federal Reserve System, as shown by the blue line in Chart A, panel b) and elevated uncertainty about inflation and growth are likely to have contributed to declining liquidity and increased the sensitivity of US and global sovereign bond markets.[2]

1 Liquidity is also inversely related to volatility as, all else being equal, market makers widen their bid-ask spreads and post less depth in order to manage the increased risk associated with taking a position when volatility is high. See Fleming, M., "How Has Treasury Market Liquidity Evolved in 2023?", *Liberty Street Economics*, 17 October 2023.

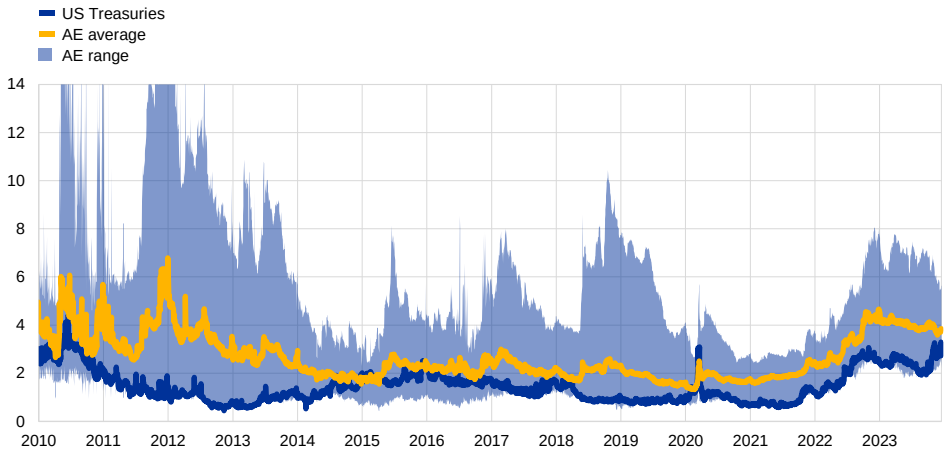
2 For details on factors contributing to the current low liquidity, see Quarterly Review, Bank for International Settlements (BIS), September 2023; Global Financial Stability Review, International Monetary Fund, October 2023, Chapter 1; and Duffie, D., "Dealer Capacity and US Treasury market functionality", *BIS Working Papers*, No 1138, BIS, October 2023.

Chart A

Liquidity developments in sovereign bond markets

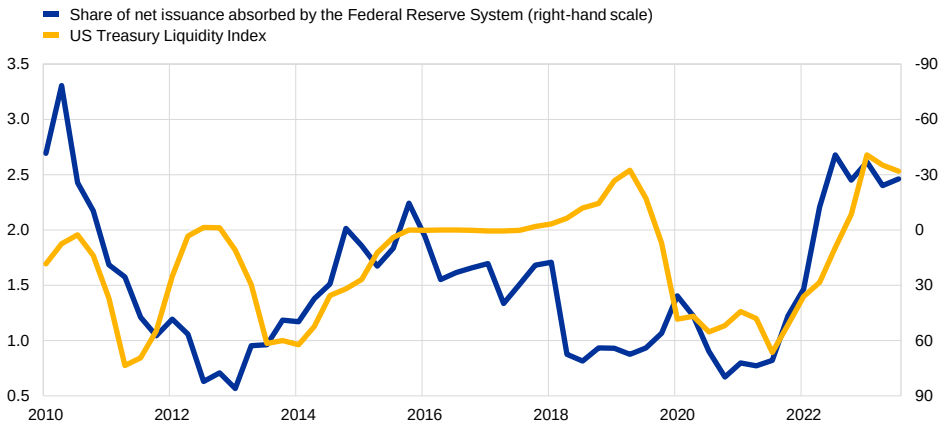
a) Spline spreads on US Treasuries and sovereign bonds of selected other major advanced economies

(percentages)



b) US Treasury spline spreads and Federal Reserve System absorption of US Treasury issuance

(left-hand scale: index values; right-hand scale: percentages (reversed))



Sources: Bloomberg, Haver and ECB staff calculations.
Notes: Panel a): the yield curve "spline spread" measures the sum of absolute values of the deviation between the observed yield curve and a cubic spline interpolation. This indicator captures the presence of arbitrage opportunities, a feature of illiquid markets, and is one of several market liquidity indicators that are typically highly correlated with each other. An increase in the spread denotes lower liquidity. Other advanced economies (AE) include Canada, France, Germany, Italy, Japan, Spain and the United Kingdom. In 2011/12 the maximum values of the spline spread reached around 25 basis points, but this is not shown on the chart for reasons of readability. Panel b): the share of net issuance absorbed by the Federal Reserve System is computed as a four-quarter average. The liquidity index displays the average yield error across the universe of US Treasury notes and bonds with remaining maturity of one year or more. The right-hand scale is reversed such that higher values denote lower absorption of US Treasury issuances.
Latest observations: panel a) 15 December 2023; panel b) third quarter of 2023.

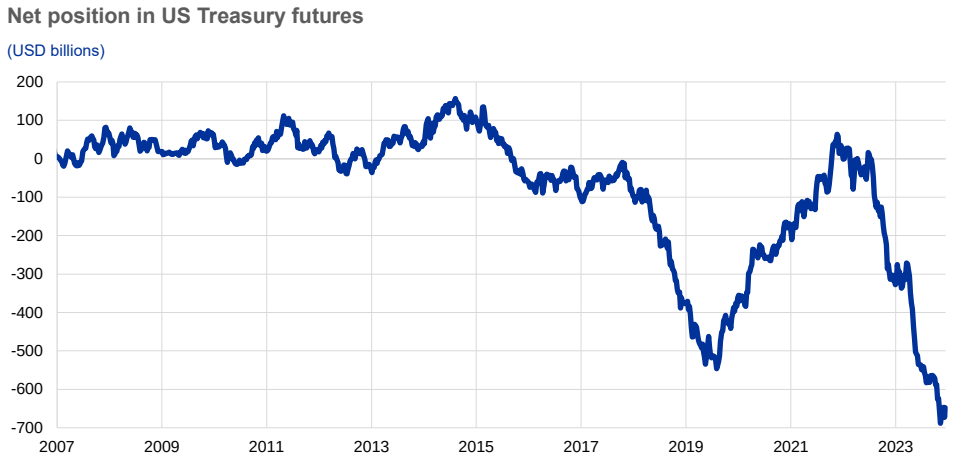
Leveraged fund activity in the US Treasury futures market could also be amplifying market sensitivity to new information. The net short positions of leveraged funds in the US Treasury futures market have reached historically high levels of around USD 650 billion, of which around USD 300 billion is at two-year maturity (Chart B).[3] This may be related to several trading strategies, such as the

[3] Leveraged funds are typically hedge funds whose strategies may involve taking outright positions or arbitrage within and across markets. A short position in a bond futures contract is profitable if the bond price falls.

"cash-futures basis trade" or directional trades betting on rate increases.[4] Although this activity could in principle help maintain liquidity in the Treasury spot market, it has been suggested that, at times, it might potentially exacerbate market sensitivity.[5]

Chart B

Leveraged funds' speculative positions in US Treasury futures



Sources: Bloomberg, Commodity Futures Trading Commission and ECB staff calculations.
Notes: The chart shows the sum of net positions in two, five and ten-year US Treasury futures held by leveraged funds. Net positions refer to the value of long positions minus the value of short positions.
Latest observation: 15 December 2023.

The effect of a US monetary policy shock on bond prices may vary depending on conditions in the US Treasury market. Empirical analysis explores whether US Treasury market conditions might be relevant for the strength of the bond market impact of a US monetary policy shock. The empirical set-up focuses on the impact of US monetary policy shocks because these are usually a major driver of global financial conditions. Local projection methods are used to examine how the effects on bond markets vary depending on the conditions in the US Treasury market. Two types of state dependence are analysed. The first approach examines whether the impact of US monetary policy differs depending on the level of US Treasury market liquidity, measured by the "spline spread", i.e. the difference between the observed yield curve and a spline interpolated curve (as shown in Chart A). The second approach examines whether the effect of US monetary policy differs depending on the size of net positions held by leveraged funds in US Treasury futures contracts (as shown in Chart B). US monetary policy shocks are identified in a daily Bayesian vector autoregression (BVAR) model using sign restrictions and are calibrated to an

4 The cash-futures basis trade involves taking a short position in Treasury futures, taking a long position in Treasury cash and borrowing in the repo market to finance the trade. It has been linked to the severe US Treasury market illiquidity known as the "dash for cash" in March 2020. See Vissing-Jorgensen, A., "The Treasury Market in Spring 2020 and the Response of the Federal Reserve", *Journal of Monetary Economics*, Vol. 124, November 2021, pp. 19-47; and Schrimpf, S., Shin, H.S. and Sushko, V., "Leverage and margin spirals in fixed income markets during the Covid-19 crisis", *BIS Bulletin*, No 2, BIS, April 2020.

5 For instance, increased sensitivity might be related to the fact that such trading strategies are generally highly leveraged and exposed to changes in repo rates and futures margins. See also Avalos, F. and Sushko, V., "Margin leverage and vulnerabilities in US Treasury futures", *BIS Quarterly Review*, BIS, September 2023, Box A; and Barth, D., Kahn, R.J. and Mann, R., "Recent Developments in Hedge Funds' Treasury Futures and Repo Positions: is the Basis Trade "Back"?", *FEDS Notes*, Board of Governors of the Federal Reserve System, August 2023.

average 10 basis point tightening of the ten-year US Treasury yield over one week.[6] The local projection estimation controls for changes in stock market volatility and economic activity and includes a dummy variable to control for the pandemic period.

The analysis suggests that the impact of a US monetary policy shock is larger when market liquidity is low or when leveraged short positions are large. The effect of a US monetary policy shock on two-year US Treasury yields is larger when US Treasury market liquidity is relatively low (Chart C, panel a).[7] This is consistent with previous studies suggesting that financial markets tend to become more sensitive to information when market liquidity is limited.[8] Similarly, the effect of a US monetary policy shock on two-year US Treasury yields tends to be larger when leveraged funds have relatively large net short positions in US Treasury futures (Chart C, panel b).[9] The 68% confidence intervals of the estimated effects overlap somewhat, indicating that, while market sensitivity to shocks varies across states, the difference in the effects is not always significant.

6 For more detail on the daily BVAR model, see Brandt, L., Saint Guilhem, A., Schröder, M. and Van Robays, I., "What drives euro area financial market developments? The role of US spillovers and global risk", *Working Paper Series*, No 2560, ECB, May 2021.

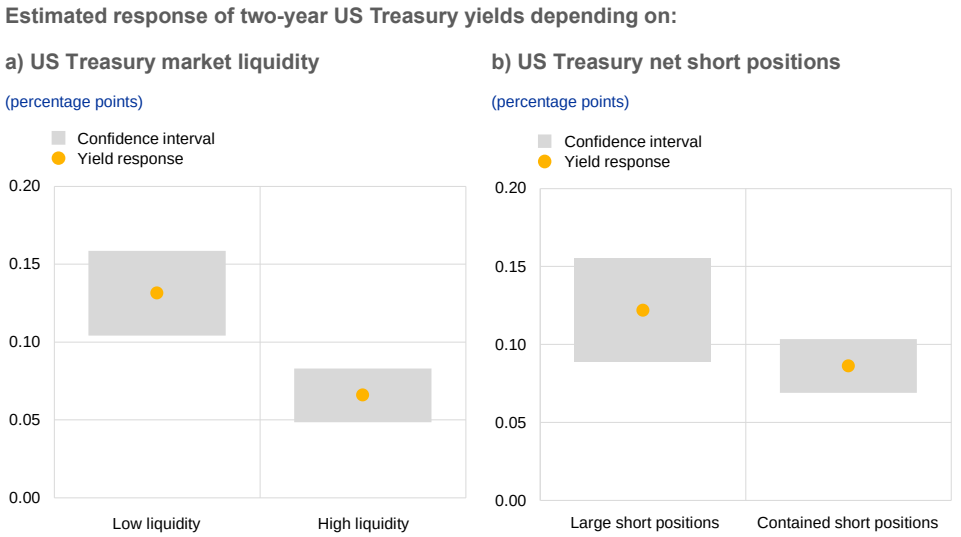
7 A US monetary policy shock of a magnitude corresponding to an average 10 basis point impact on the ten-year US Treasury yield results in around a 13 basis point rise in two-year US Treasury yields after one week when liquidity is low, but around a 7 basis point increase when US Treasury market liquidity is relatively high.

8 See, for example, Guimaraes, R., Pinter, G. and Wijnandts, J.C., "The liquidity state-dependence of monetary policy transmission", *Staff Working Papers*, No 1045, Bank of England, October 2023; de Vette, N., Klaus, B, Kördel, S. and Sowiński, A., "Why market and funding liquidity matter and how they interact", *Financial Stability Review*, ECB, May 2023, Special Feature A, Section 2; and Adrian, T. and Shin, H.S., "Liquidity, Monetary Policy, and Financial Cycles", *Current Issues in Economics and Finance*, Vol. 14, No 1, Federal Reserve Bank of New York, January/February 2008.

9 The estimates point to around a 12 basis point rise in two-year Treasury yields in response to a monetary policy shock when leveraged funds' net short positions are substantial, compared to around a 9 basis point rise when these short positions are relatively contained.

Chart C

Impact of a US monetary policy shock depending on US Treasury market conditions



Sources: Bloomberg Finance L.P., Refinitiv and ECB staff calculations.
Notes: The yellow dots represent the mean estimate of the response of two-year US Treasury yields to a monetary policy shock. The shock corresponds to around a 10 basis point tightening in the ten-year US Treasury yield over one week and is estimated in a daily BVAR model using a combination of sign and relative magnitude restrictions. Impulse responses are shown at impact and are estimated using local projections allowing for state dependence, following Ramey, V. and Zubairy, S., "Government Spending Multipliers in Good Times and in Bad: Evidence from US Historical Data", *Journal of Political Economy*, Vol. 126(2), April 2018, pp. 850-901, with the state transition parameter gamma assumed to be 2. The estimation employs weekly data over the period 2010-23, controlling for economic activity, funding conditions, interest rates and market uncertainty (measured by the Citigroup Economic Surprise Index, the spread between the ten-year and two-year US Treasury rates, the financial conditions index, the VIX and the MOVE), and includes a crisis dummy for the outbreak of the pandemic during February-May 2020. The states are defined on the basis of liquidity in the US Treasury market (panel a) and net positions of leveraged funds in US Treasury futures contracts (panel b). Shaded areas refer to 68% confidence intervals based on Newey-West standard errors.
Latest observation: September 2023.

The results also provide some evidence that US Treasury market conditions can amplify bond market reactions to US monetary policy in other countries.

The effect of a US monetary policy shock on bond markets in other advanced economies is found to be slightly larger when liquidity conditions in US Treasury markets are tighter than normal (Chart D, panels a and b).[10] This could be related to the significant role of US Treasuries in various trading strategies and benchmark pricing, as well as the fact that a deterioration in liquidity in US markets might also be related to declining global market liquidity.

10 A US monetary policy shock is associated with an increase of around 16 basis points in foreign long-term yields and around 3 basis points in foreign short-term rates, when US Treasury market liquidity is tighter than normal, as compared to around 10 and 1 basis points, respectively, in normal liquidity conditions.

Chart D

Estimated yield response in other advanced economies to a US monetary policy shock depending on liquidity conditions in the US Treasury market

Sources: Bloomberg Finance L.P., Refinitiv and ECB staff calculations.
Notes: The yellow dots represent the mean estimate of the response of long-term yields (panel a) and short-term rates (panel b) of advanced economies to a US monetary policy shock. The shock corresponds to around a 10 basis point tightening in the ten-year US Treasury yield over one week and is estimated in a daily BVAR model using a combination of sign and relative magnitude restrictions. Impulse responses are shown after one week and are estimated over the period 2010-23 by local projections allowing for state dependence. The coefficient estimates of the local projections are reported conditional on the state of the US Treasury market. The state of US Treasury market liquidity is defined using a proxy based on the average yield errors of US Treasury bonds from a fitted Treasury curve. Additional controls include the VIX equity market volatility index, the US and global Citi Economic Surprise indices, and lags of the dependent variable. Shaded areas refer to 68% confidence intervals based on Newey-West standard errors.
Latest observation: September 2023.

Overall, the empirical analysis suggests that both domestic and global bond market reactions to US monetary policy might be stronger under certain US Treasury market conditions. These findings could help explain part of the relatively large adjustments in US Treasury yields observed during 2023, as declining Treasury market liquidity might be one of the factors contributing to higher yield sensitivity. The empirical results also illustrate the link between US Treasury market conditions and the broader sensitivity of bond markets to monetary policy.

2 Geopolitical risk and oil prices

Prepared by Massimo Ferrari Minesso, Marie-Sophie Lappe and Denise Rößler

The relation between geopolitical developments and oil prices is not clear-cut. Historically, there is no clear relationship between oil prices and geopolitical events, such as emerging tensions between countries or terrorist attacks. For example, immediately after the 9/11 attacks, Brent prices increased by 5% (about five times the average daily change in the Brent price between 2000 and 2023). However, within 14 days the price dropped by around 25% on the back of concerns about weakening oil demand. When Russia invaded Ukraine in February 2022, Brent prices increased by almost 30% within the first two weeks following the invasion. However, prices then decreased again, returning to their pre-invasion levels after around eight weeks. More recently, Brent prices increased by about 4% after the terrorist attacks in Israel on 7 October 2023 before subsequently stabilising.[1] Taking a more comprehensive perspective, Chart A plots the global geopolitical risk (GPR) index of Caldara and Iacoviello (2022) against the log of the Brent crude oil price.[2] The index is constructed by applying text analysis methods to newspaper articles and tracking the news coverage of events related to geopolitical tensions globally.[3] Large spikes in the index, which capture major geopolitical events, are not systematically associated with higher or more volatile oil prices. On the contrary, after many events, oil prices remain weak for several months.

1 After one month, the Brent price stood below the level observed on the day before the attacks, at USD 79 per barrel.

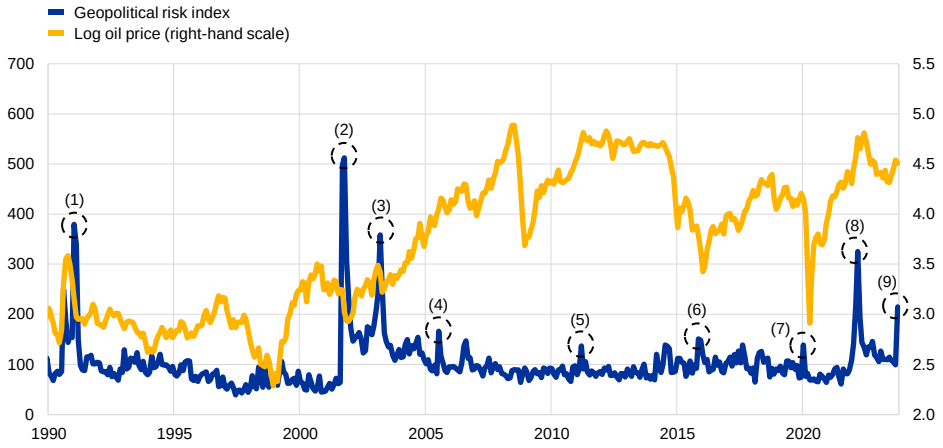
2 Caldara, D. and Iacoviello, M., "Measuring Geopolitical Risk", *American Economic Review*, American Economic Association, Vol. 112, No 4, 2022, pp. 1194-1225.

3 The index is based on ten newspapers (*Chicago Tribune*, *The Daily Telegraph*, *Financial Times*, *The Globe and Mail*, *The Guardian*, *Los Angeles Times*, *The New York Times*, *USA Today*, *The Wall Street Journal* and *The Washington Post*) and is constructed by counting the number of articles related to adverse geopolitical events in each newspaper for each month (as a share of the total number of news articles). It is separately constructed for the global economy and 44 countries.

Chart A

Oil prices and geopolitical risk since 1990

(left-hand scale: index, right-hand scale: log of the Brent crude oil price)



Sources: Haver, Caldara and Iacoviello (2022), and ECB staff calculations.
Notes: The latest observations are for October 2023. The numbered peaks refer to the following geopolitical events: (1) Gulf War; (2) 9/11 terrorist attacks; (3) Invasion of Iraq; (4) London terrorist attack; (5) Arab Spring and civil war in Libya; (6) Paris terrorist attacks; (7) Attack on US embassy in Iraq; (8) Russian invasion of Ukraine; (9) Israel-Hamas war.

Geopolitical shocks can have an impact on oil prices through lower economic activity or higher risks to commodity supply. In principle, geopolitical risk can affect commodity and oil prices through two main channels. First, higher geopolitical tensions act as a negative global demand shock, because these tensions increase uncertainty about the economic outlook, which negatively affects consumption and investment and potentially disrupts international trade. Combined, these forces lead to a contraction in global economic activity, ultimately dampening global oil demand and prices. This is known as the economic activity channel. Second, the risk channel involves financial markets potentially pricing in higher risks to future oil supply over and above the current geopolitical shock. This increases the cash value of holding oil contracts, also known as the convenience yield, and puts upward pressure on Brent prices.[4] These two channels move oil markets in opposite directions, and the channel that prevails is an empirical question. Additional confounding factors include oil producers potentially deciding to adjust their oil production to stabilise prices.

On average, a global geopolitical shock puts downward pressure on the oil price. The reaction of oil prices – as measured by the Brent variety – to global geopolitical shocks can be identified with a VAR model, netting out the response of oil producers and controlling for global activity and the financial cycle.[5] The model covers the period from January 2000 to October 2023 and is estimated with

4 See Szymanowska, M., de Roon, F., Nijman, T. and van den Goorbergh, R., "An Anatomy of Commodity Futures Risk Premia", *Journal of Finance*, American Finance Association, Vol. 69, No 1, 2014, pp. 453-482.

5 Shocks are identified through Cholesky ordering, with the GPR index ordered first, as in Caldara and Iacoviello, op. cit. The ordering implies that any contemporaneous correlation between economic variables and the GPR index reflects the effect of geopolitical events on the economic variables, rather than the other way around. Caldara and Iacoviello provide extensive validation of this exogeneity assumption.

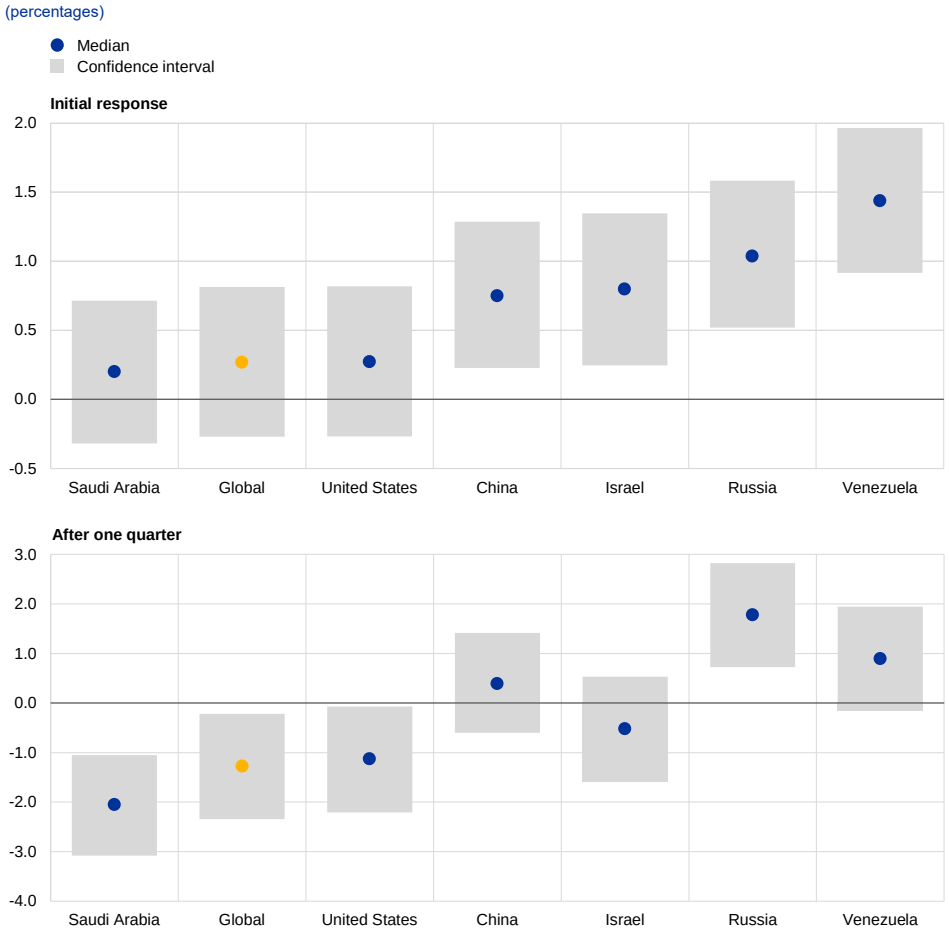
Bayesian methods.[6] Chart B plots the initial and three-month estimated responses of the Brent price to a one standard deviation geopolitical shock, which corresponds to about one-tenth of the value assumed by the index in the aftermath of the 9/11 attacks (yellow dot in the chart, referring to a global geopolitical risk shock). The estimated elasticities indicate that it takes time for global geopolitical shocks to have an impact on Brent prices, which initially remain stable (the elasticity is not significantly different from zero), before falling by about 1.2% after one quarter. This suggests that the economic activity channel – the knock-on effects of higher uncertainty on demand – dominates in the reaction of oil markets.[7] In other words, global geopolitical shocks typically imply downward risks to oil prices.

6 Specifically, the VAR model includes 12 lags of five monthly variables: the global GPR index, the (log) Brent oil price, (log) world industrial production, the (log) US stock market price and the two-year yield to capture the global financial cycle. The model is estimated using Bayesian methods and standard Minnesota priors. Results are robust to accounting for the COVID-19 pandemic as in Lenza, M. and Primiceri, G.E., "How to estimate a vector autoregression after March 2020", *Journal of Applied Econometrics*, Vol. 37, No 4, 2022, pp. 688-699. The sample covers the period from January 2000 to October 2023.

7 Global industrial production contracts by about 0.1% and stock prices by 0.5% over the same horizon.

Chart B

Estimated responses of oil prices to country-specific and global geopolitical shocks



Sources: Haver, Caldara and Iacoviello (2022) and ECB staff calculations.
Notes: The chart shows the response of the Brent oil price to a one standard deviation geopolitical risk shock. Shocks are identified as in Caldara and Iacoviello (2022), estimating country-specific VAR models with Cholesky ordering and the GPR index ordered first. Each VAR includes a country-specific GPR index, global industrial production, the Brent oil price, the domestic stock market index and the US two-year yield. All variables excluding the index and the two-year yield enter in logs. The sample covers the period from January 2000 to October 2023. Countries are ordered according to the size of the initial response.

However, the impact of geopolitical shocks varies across countries, depending on the origin of the shocks in question. Tensions originating from key oil producers or from countries playing a strategic role in the distribution of oil products might affect oil markets differently. If countries involved in geopolitical tensions account for a small share of the global economy, they are unlikely to significantly affect global growth; this would tend to dampen the economic activity channel of geopolitical shocks. However, if the countries involved are key producers in global oil markets, the risks to oil supply could generate significant upward pressure on prices. This hypothesis can be tested by estimating the response of Brent prices to country-specific, as opposed to global, geopolitical shocks. To this end, Chart B also reports the estimated elasticities of the oil price to geopolitical shocks originating in some of the largest oil producers (the United States, Saudi Arabia, Russia and China), Venezuela (which has the largest oil reserves) and Israel (which is not an oil

producer itself but a key player in Middle Eastern politics).[8] The estimates point to significant variations in country-specific responses, which suggests that not all geopolitical shocks are alike. US shocks behave similarly to global shocks; the reaction is initially insignificant and then turns negative after one quarter, by -1.1%. This is not surprising considering the major role of the United States in the global economy. Reactions are different when shocks from other sources are considered. Shocks in Saudi Arabia remain contractionary, suggesting that geopolitical developments in that country mirror global patterns.[9] However, geopolitical tensions associated with China, Israel, Russia and Venezuela put upward pressure on the Brent oil price, which immediately increases by between 0.8 and 1.5%.[10] For these countries, the risk channel clearly dominates: oil prices increase because traders expect disruptions to future oil supplies.

Oil price pressures arising from adverse geopolitical shocks are generally short-lived, with elasticities becoming insignificant after one quarter for most countries.[11] Price pressures due to geopolitical shocks in most countries are short-lived, as concerns over future oil supply fade out.[12] However, price effects can last longer depending on the duration of geopolitical tensions in the sample considered or because of country-specific factors. Overall, the empirical evidence suggests that geopolitical shocks can have different implications depending on the countries involved. Recent heightened geopolitical uncertainty stresses the need to identify the nature of geopolitical shocks to disentangle their effects on oil prices and inflation.

8 Iran and Iraq – two other important oil-producing countries – are excluded, because country-specific indices are not available for them. Instead, Israel is included as the closest geopolitical neighbour to Iran, as tensions in Israel often also involve Iran. In this case, elasticities are constructed by substituting the global index with one of the country-specific indices. The VAR controls for local and global macroeconomic developments and uses the index as an internal instrument to identify country-specific geopolitical shocks.

9 The global and Saudi Arabia GPR indices are strongly correlated.

10 The results for Israel might capture the potential involvement of Iran – a major oil producer – in geopolitical tensions.

11 With regard to Russia, geopolitical shocks continue to influence oil markets after one quarter, as prices remain 2% higher. In the case of Russia's invasion of Ukraine in 2022, this might reflect the imposition of an embargo on oil imports from Russia.

12 This is likely due to geopolitical tensions being short-lived or supply being substituted by other oil producers. The data do not seem to support the alternative explanation that global demand contracts after regional geopolitical shocks in these economies, as the response of global output is typically insignificant in the country-specific VARs.

3 Potential output in times of temporary supply shocks

Prepared by Guzmán González-Torres, José Emilio Gumiel and Béla Szörfi

According to the estimates of major international institutions, the euro area output gap has remained negative or very close to zero in recent years, despite the rise in euro area core inflation.[1] Motivated by policy considerations related to fiscal, financial and external sustainability, the potential output estimates produced by international institutions such as the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD) and the European Commission are computed under the assumption that potential output mostly only fluctuates in response to medium-run – i.e. either permanent or highly persistent – structural shocks.[2] This approach was maintained during the pandemic and the associated supply shock, which many assumed would be transitory given the reversal of containment measures and the supporting role of macroeconomic policies.[3]

A simple aggregate demand-aggregate supply model illustrates how temporary supply shocks, which do not alter potential output, create output gaps negatively correlated with inflation.[4] The model predicts that positive aggregate demand shocks create positive output gaps while pushing up both output and inflation (Chart A, panel a). At the same time, temporary adverse supply-side shocks – that is, supply shocks that cause inflation but do not alter potential output – push output below potential. In other words, these shocks cause negative output gaps (Chart A, panel b). A simultaneous fall in output and rise in inflation that does not lead to a negative output gap can only be achieved if potential output falls at least as much as output. If potential output is not affected, and assuming there are no significant second-round effects from increasing wages, inflation will go back to

1 See "Autumn 2023 Economic Forecast: A modest recovery ahead after a challenging year", European Commission, Brussels, November 2023, "World Economic Outlook: Navigating Global Divergences", IMF, Washington D.C., October 2023, and "Economic Outlook: Restoring growth", OECD, Paris, November 2023.

2 See Chalaux, T. and Guillemette, Y., "The OECD Potential Output Estimation Methodology", *Economics Department Working Papers*, No 1563, OECD, Paris, 2019, Havik, K. et al., "The Production Function Methodology for Calculating Potential Growth Rates and Output Gaps", *Economic Papers*, 535, European Commission, Brussels, November 2014, and De Resende, C., "IEO Evaluation Report", *IMF Forecasts*, Independent Evaluation Office of the International Monetary Fund, Washington D.C., April 2014, Chapter 5.

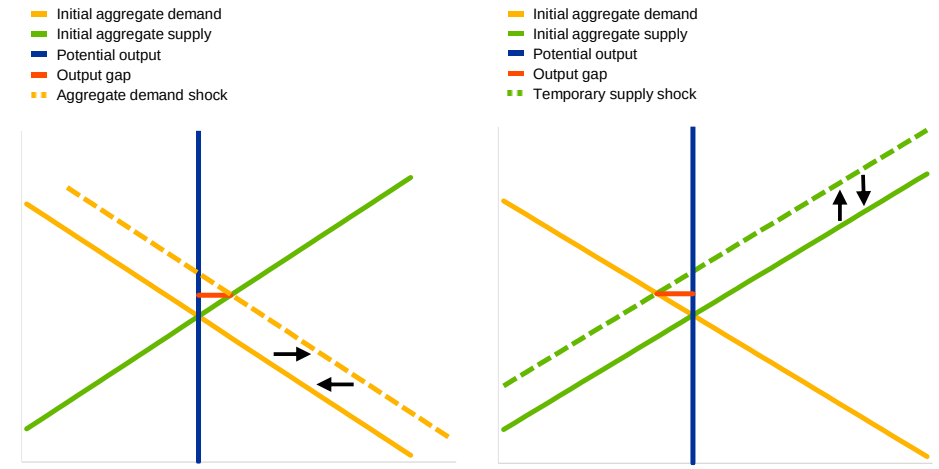
3 For more details, see the article entitled "The impact of COVID-19 on potential output in the euro area", *Economic Bulletin*, Issue 7, ECB, Frankfurt am Main, 2020.

4 Macroeconomic theory encompasses a variety of notions of potential output that differ in the degree to which they balance capturing the relatively stable long-run level of production at the expense of signalling inflationary pressures in the presence of temporary shocks to the economy's productive capacity. See for example Vetlov, I., Hlédik, T., Jonsson, M., Kucsera, H. and Pisani, M., "Potential Output in DSGE Models," *Working Paper Series*, No 1351, ECB, Frankfurt am Main, 2011. International institutions typically measure potential output as the highest level of economic activity that can be sustained over the long term. Accordingly, these potential output measures reflect a medium to long-term view of output, with growth rates that move relatively slowly over time. The difference between actual output and potential output is referred to as the output gap, which reflects the cyclical position of the economy. In normal times – that is, when demand shocks dictate the phase of the economy – the output gap is thought to signal short-term inflationary pressures.

the initial level. In the first case the output gap will converge to zero from a positive level, while in the second it will go back to zero from a negative level.

Chart A

Simple aggregate demand-aggregate supply model



Source: ECB staff.
Notes: The chart illustrates the aggregate supply-aggregate demand model,[5] with output on the x-axis and inflation on the y-axis. The aggregate supply schedule represents the inflation rate that would result from firms' pricing decisions at any given production level in the short run. The aggregate supply schedule shifts upwards (downwards) in response to changes in firms' cost structures – such as increases (decreases) in input prices, decreases (increases) in input availability and decreases (increases) in productivity – as well as to increases (decreases) in firms' inflation expectations. The aggregate demand schedule represents the amount of goods and services demanded by households, firms, governments and the external sector in the short run at any given level of inflation. The aggregate demand schedule shifts outwards (inwards) in response to a variety of demand shocks, for example increases (decreases) in household income, decreases (increases) in investment costs, increases (decreases) in government spending, or exchange rate depreciations (appreciations). The assumed temporary nature of the shocks depicted prompt the corresponding schedules to first shift outwards (upwards) and then back to their original positions. The output gap is measured as the horizontal distance between the equilibrium level of output and potential output. The latter is assumed to remain unchanged throughout.

Structural models, such as the New Area-Wide Model (NAWM), can help illustrate the effects of supply shocks on potential output.[6] The NAWM is used to provide a decomposition of the European Commission's output gap, which is imposed as an observed variable. This set-up separately identifies supply and demand drivers (Chart B), among other factors. The decomposition shows how considering potential output to be relatively smooth leads the model to identify the recently observed supply shocks as negative contributors to the output gap. It also suggests that supply shocks played a limited role in the run-up to the pandemic, with demand shocks dominating. All in all, the predominance of supply shocks would seemingly be an exceptional occurrence from a historical perspective.

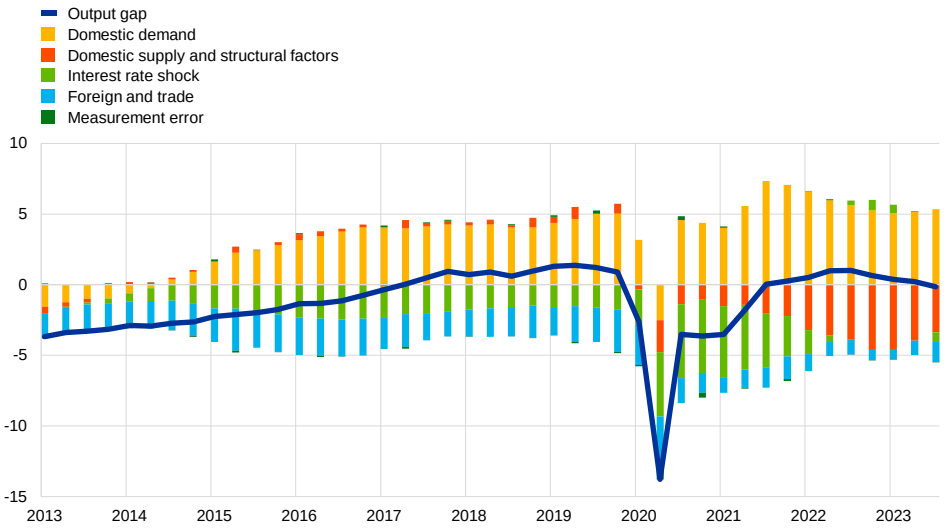
5 See for example Robert, F., Bernanke, B., Antonovics, K. and Heffetz, O., "Principles of Economics", Eight Edition, McGraw-Hill Education, New York, NY, 2022.

6 The NAWM is a dynamic stochastic general equilibrium model used during ECB projection exercises. See Coenen, G., Karadi, P., Schmidt, S. and Warne, A., "The New Area-Wide Model II: an extended version of the ECB's micro-founded model for forecasting and policy analysis with a financial sector", *Working Paper Series*, No 2200, ECB, Frankfurt am Main, November 2018.

Chart B

NAWM-based shock decomposition of the European Commission's interpolated output gap estimate

(x-axis: quarters; y-axis: percentage of potential output and percentage contributions)



Sources: The European Commission's Autumn 2023 Economic Forecast and ECB staff calculations.
Notes: The European Commission does not provide quarterly output gap estimates. Their annual output gap estimates have therefore been interpolated into quarterly frequency by ECB staff. The category "Domestic supply and structural factors" includes the contributions of the initial state, the model's discount rate shock, the permanent technology shock, the transitory and investment-specific technology shocks as well as wage and price mark-ups. "Interest rate shock" comprises the short-term interest rate shock and the shock to the retail bank's markdown. "Domestic demand" includes the domestic risk premium shock and the shock to government spending. The category "Foreign and trade" captures shocks to foreign demand, foreign prices, US three-month and ten-year interest rates, competitors' export prices, oil prices, import demand, export preferences, mark-up shocks to export and import prices, and a foreign risk premium shock.

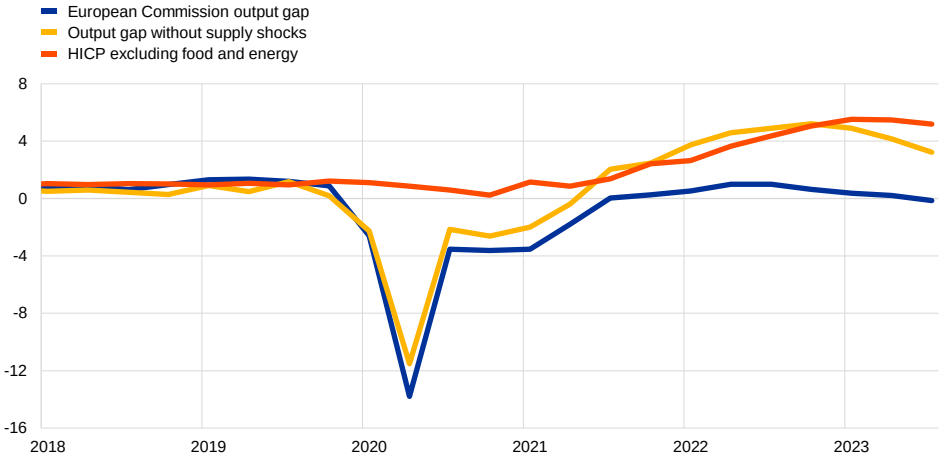
Adjusting the output gap estimates for the above-identified supply shocks would make the former more positive for the years 2021-2023, although this would result in a more volatile potential output estimate. This would be a direct consequence of the assumption that the supply shocks identified by the NAWM were of a more permanent nature than implied by the above decomposition and therefore mostly absorbed by the level of potential output rather than the output gap (Chart C, panel a). The potential output estimate resulting from this thought experiment falls in 2020 and then again in 2022 because of transitory supply shocks, significantly increasing its volatility (Chart C, panel b).

Chart C

Accounting for temporary supply shocks in the European Commission's potential output estimate

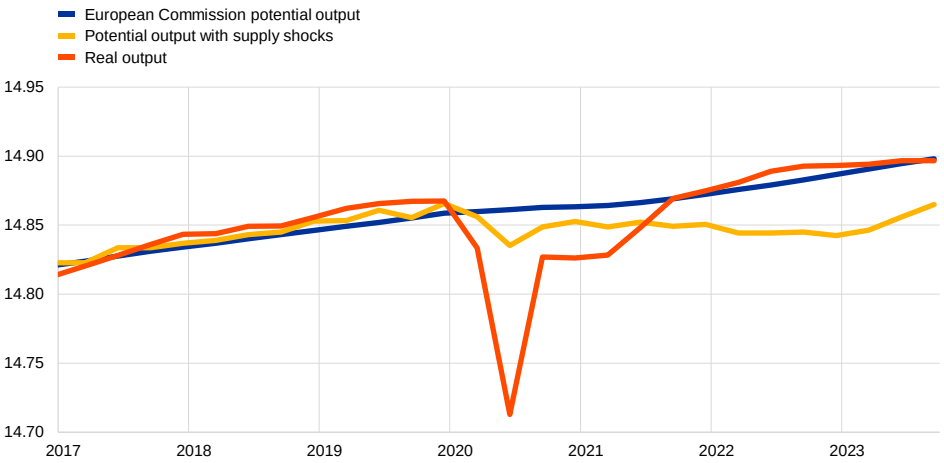
a) Alternative output gap estimates and HICPX inflation

(x-axis: quarters; y-axis: percentage of potential output, annual percentage change)



b) Alternative potential output estimates and real GDP

(x-axis: quarters; y-axis: log levels)



Sources: The European Commission's Autumn 2023 Economic Forecast and ECB staff calculations.
Notes: The "Output gap without supply shocks" series shows the European Commission's output gap once the supply shocks identified by the NAWM in Chart B have been subtracted. The "Potential output with supply shocks" series shows the implicit potential output estimate resulting from the aforementioned output gap estimate.

Survey-based measures of slack capture capacity utilisation or the relative strength of demand without the need for an economic model. Such measures provide empirical guidance on the extent to which transitory changes to firm-level productive capacity affect the inflation-relevant potential output level. Surveys enquiring about the degree of capacity utilisation of firms show that firms in manufacturing, services and construction were producing at relatively high capacity at the onset of the pandemic, while during the pandemic they were operating at less of a reduced capacity utilisation than indicated by the standard output gap

estimates.[7] Capacity utilisation rebounded quickly in 2021 and reached historical highs by early 2022. It eased significantly in manufacturing in 2022-2023 (albeit staying above the historical average), while remaining strong in services and construction.

Slack measures derived from firm-level surveys better reflect the inflation dynamics of recent years, but they deliver more volatile trend output counterparts. Capacity utilisation co-moves rather strongly with HICP inflation excluding food and energy, suggesting ongoing, though partly declining, upward pressure on core inflation (Chart D, panel a). An econometric analysis using a reduced-form Phillips curve confirms that the survey-based slack measure produces somewhat smaller short-term inflation forecast errors for the recent high-inflation period. However, slack indicators based on firm-level surveys deliver an even more volatile trend output for during the pandemic than the slack measure constructed using the NAWM exercise (Chart D, panel b). This suggests that these indicators may not be suitable to provide estimates of medium-term potential output.

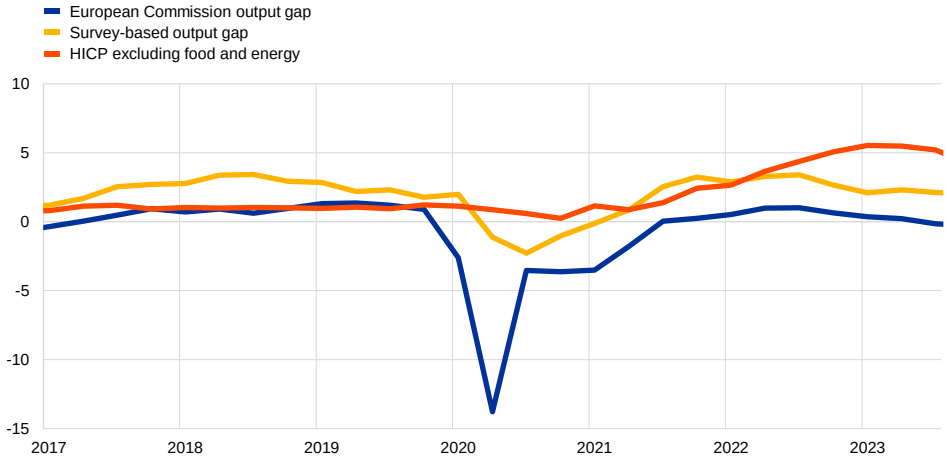
[7] The European Commission's business surveys measure the average level of firm capacity utilisation as well as the main economic factors limiting production: demand, labour, other inputs (materials, equipment and space), financial constraints, the weather, other, or none of the aforementioned factors. While capacity utilisation is only available for both manufacturing and services starting in 2011, the series for some of the limiting factors are available for both sectors and construction starting in 2003. Out of these, demand as a limiting factor of production has a high correlation with capacity utilisation. The latter is thus used as a proxy for measuring slack.

Chart D

Comparison between a survey-based slack measure and the European Commission's output gap estimate

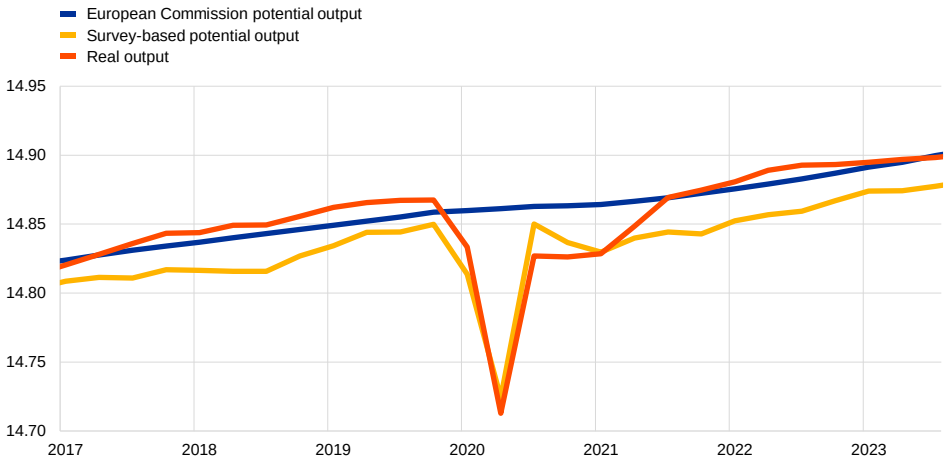
a) Alternative output gap measures and HICPX inflation

(x-axis: quarters; y-axis: percentage of potential output, annual percentage change)



b) Alternative potential output measures and real GDP

(x-axis: quarters; y-axis: log levels)



Sources: The European Commission's Autumn 2023 Economic Forecast, ECB staff and the European Commission's business surveys.

In conclusion, alternative estimates of potential output and the output gap may complement the medium-term estimates of major international institutions at certain times. The proposed complementary measures of slack seem to provide better short-term forecasts of inflation in times of temporary supply shocks than an output gap estimate based on a smooth notion of potential output. However, caution should be taken in interpreting the slack-based estimates as measures of the phase of the business cycle, as the derived potential output estimates are more volatile, possibly providing less information regarding the medium-term growth prospects of the economy.

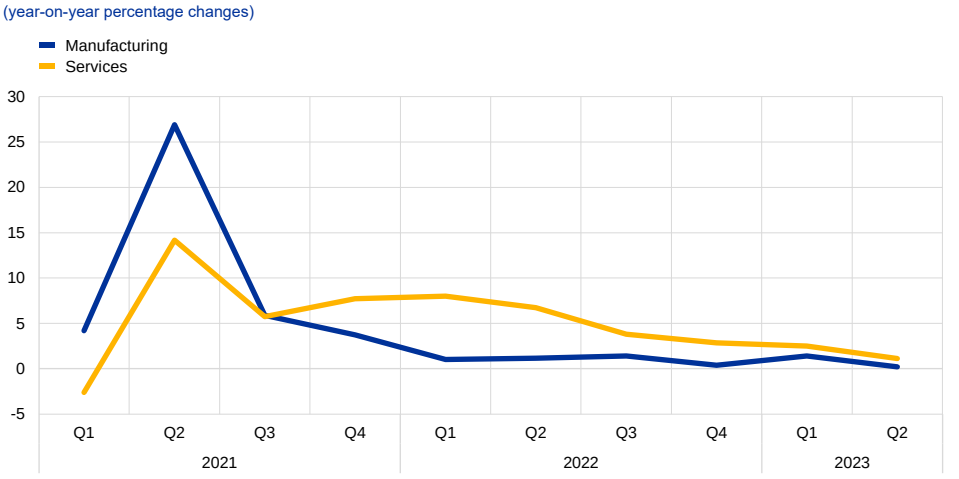
4 Monetary policy and the recent slowdown in manufacturing and services

Prepared by Niccolò Battistini and Johannes Gareis

Economic activity in the euro area has slowed down in both manufacturing and services.[1] Since the end of 2021, economic activity, measured in terms of real gross value added, has grown at a significantly faster pace in the market services sector – i.e. services excluding public administration, education, health and social services – than in the manufacturing sector (Chart A). This has reflected, on the one hand, relatively buoyant demand for contact-intensive services, supported by the reopening of the economy following the pandemic, and, on the other hand, weak demand for goods, global supply bottlenecks and, later, the tightening of financing conditions induced by the monetary policy response to the rapid and strong increase in inflation.[2] However, services activity, which typically follows manufacturing in the business cycle, has also weakened recently.[3] This box looks at the leading properties of manufacturing activity in the euro area for market services, focusing on the role of monetary policy.

Chart A

Manufacturing and services activity in the euro area



Sources: Eurostat and ECB calculations.
Notes: Manufacturing refers to real gross value added in NACE Rev. 2 classification sector C, excluding Ireland. Services refers to real gross value added in NACE Rev. 2 classification sectors G to N and R to U (market services).

1 The measure for manufacturing activity refers to the euro area aggregate excluding Ireland, on account of the considerable volatility in Irish intellectual property products. See the box entitled "Intangible assets of multinational enterprises in Ireland and their impact on euro area GDP", *Economic Bulletin*, Issue 3, ECB, 2023.

2 See the box entitled "What role do reopening effects play across countries and sectors?", *Economic Bulletin*, Issue 6, ECB, 2023; the box entitled "The impact of higher energy prices on services and goods consumption in the euro area", *Economic Bulletin*, Issue 8, ECB, 2022; as well as the article entitled "The role of supply and demand in the post-pandemic recovery in the euro area", *Economic Bulletin*, Issue 4, ECB, 2023.

3 For a survey-based analysis, see the box entitled "The drivers of recent developments in business activity expectations across sectors", *Economic Bulletin*, Issue 7, ECB, 2023.

A lead-lag analysis shows that manufacturing activity leads services activity over the business cycle. The analysis estimates correlation coefficients at different leads and lags of manufacturing and services activity from the first quarter of 1999 to the second quarter of 2023, both for the full sample and for five-year rolling windows. The results show that manufacturing appears to lead services, although recently to a slightly lesser extent, whereas no clear leading relation can be established in the other direction (Chart B). These results hold at different horizons and are confirmed by Granger causality tests, which suggest that manufacturing activity predicts activity in services better than vice versa. This property of manufacturing can be explained by several characteristics of goods relative to services, such as their greater dependence on foreign demand through trade and competitiveness channels, the longer supply chains and higher working capital needed for their production, as well as their greater durability. Further, input-output linkages between the two sectors tend to induce spillover effects that, on average, go mainly from manufacturing to services.[4] These features mean that manufacturing activity typically reacts more strongly and quickly to certain economic shocks, such as changes in interest rates.[5] Overall, the results suggest that the dynamics in manufacturing contain information relevant to the near-term dynamics in services, and thus for the rest of the economy. At the current juncture, however, this may not yet be fully apparent, owing to the effects of the reopening of the economy, which have supported activity in the services sector.[6]

4 Within the services sector, these spillover effects are particularly relevant for business services. See, for example, the box entitled "Developments in the services sector and its relationship with manufacturing", *Economic Bulletin*, Issue 7, ECB, 2019. However, the effects may also go in the other direction, i.e. from services to manufacturing, in a context of large services-specific shocks, such as the restrictions on mobility and the reopening of the economy observed since the start of the pandemic.

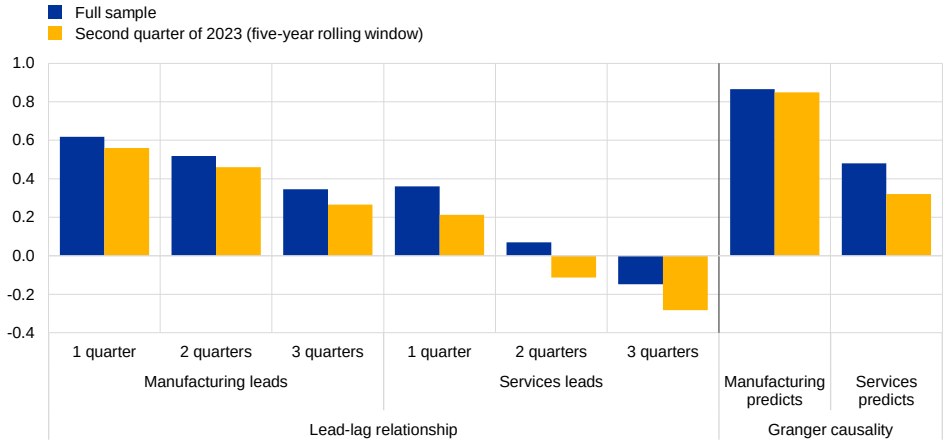
5 See, for example, Dedola, L. and Lippi, F., "The monetary transmission mechanism: Evidence from the industries of five OECD countries", *European Economic Review*, Vol. 49, No 6, 2005, pp. 1543-1569; Peersman, G. and Smets, F., "The Industry Effects of Monetary Policy in the Euro Area", *The Economic Journal*, Vol. 115, No 503, 2005, pp. 319-342; and Hahn, E., "The impact of exchange rate shocks on sectoral activity and prices in the euro area", *Working Paper Series*, No 796, ECB, 2007.

6 See the box entitled "What role do reopening effects play across countries and sectors?", *Economic Bulletin*, Issue 6, 2023.

Chart B

Leading relationship between manufacturing and services activity

(lead-lag relationship: correlation coefficient; Granger causality: one minus p-value)



Sources: Eurostat and ECB calculations.
Notes: The Granger causality tests are based on vector autoregression models with three variables, namely real gross value added in manufacturing, services and the rest of the economy, estimated between the first quarter of 1999 and the second quarter of 2023. The measure of one minus p-value refers to the probability that the hypothesis of no Granger causality can be rejected.

An empirical model confirms that monetary policy shocks have a greater impact on manufacturing than on services. A Bayesian structural vector autoregression (BSVAR) model includes genuine monetary policy surprises as reflected in changes in one-year overnight index swap (OIS) risk-free rates around the ECB's monetary policy announcements to help identify monetary policy shocks (i.e. unexpected changes in interest rates). It also includes the one-year government bond yield, economic activity in manufacturing, services and the rest of the economy, as well as other domestic and foreign variables.[7] The monetary policy shocks are assumed to induce increases in the movements in OIS rates and the government bond yield on impact and reduce economic activity over the following year. The results suggest that monetary policy shocks have an impact on manufacturing that is almost twice as strong and around two quarters faster than their impact on services, broadly in line with recent evidence from different empirical tools (Chart C).[8] This

7 The BSVAR model uses euro area data from the first quarter of 1999 to the second quarter of 2023. Besides the genuine monetary policy surprises, the one-year government bond yield and the real activity variables, it includes the private consumption deflator, the effective exchange rate, foreign demand and the New York Federal Reserve Bank's Global Supply Chain Pressure index. The model takes account of the marked volatility of macroeconomic data in 2020 by using a pandemic heteroskedasticity adjustment. See Lenza, M. and Primiceri, G., "How to estimate a vector autoregression after March 2020", *Journal of Applied Econometrics*, Vol. 37, Issue 4, June/July 2022, pp. 688-699. The genuine monetary policy surprises are identified with sign restrictions using changes in one-year OIS rates and stock prices around monetary policy events from the euro area monetary policy database. A surprise monetary policy tightening is assumed to raise the OIS rates and lower stock prices in a narrow window around the policy announcement, while the opposite holds for a surprise monetary policy easing. These surprises are then summed for the respective quarter in order to obtain the same quarterly basis as for the real activity variables. See Altavilla, C., Brugnolini, L., Gürkaynak, R., Motto, R. and Ragusa, G., "Measuring euro area monetary policy", *Journal of Monetary Economics*, Vol. 108, December 2019, pp. 162-179; and 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.

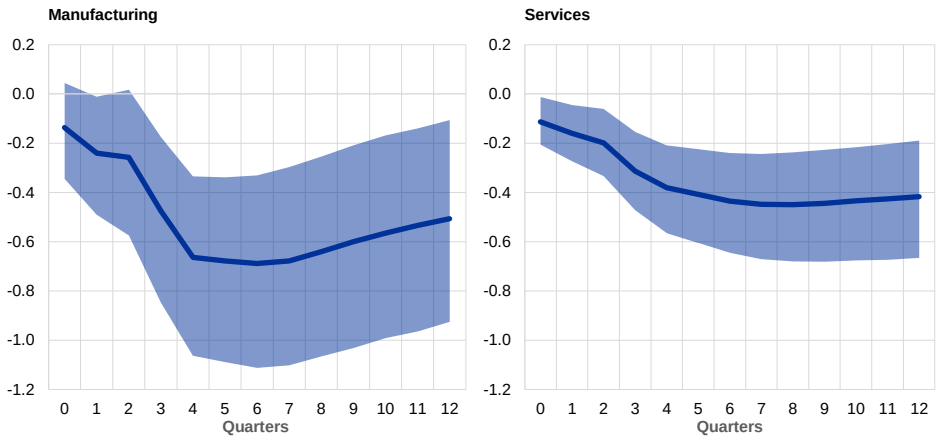
8 These results are qualitatively and quantitatively in line with previous studies indicating a stronger effect of monetary policy on manufacturing and a slightly more persistent effect on services. See Hauptmeier, S., Holm-Hadulla, F. and Nikalexi, K., "Monetary policy and regional inequality", *Working Paper Series*, No 2385, ECB, 2020. See also the box entitled "Industry structure and the real effects of monetary policy", *Economic Bulletin*, Issue 7, ECB, 2023.

stronger and faster reaction of manufacturing to unexpected interest rate changes helps explain its leading property in the business cycle and suggests that monetary policy tightening may, among other factors, be playing an important role in the speed of the slowdown in manufacturing and services activity.

Chart C

Average impact of monetary policy tightening shocks on manufacturing and services activity

(percentage changes)



Sources: Eurostat, Eurosystem, Altavilla et al., op. cit., and ECB calculations.
Notes: The chart shows BSVAR-based impulse response functions of manufacturing and services activity to a one-standard deviation monetary policy tightening shock. The solid lines represent median responses and the shaded areas represent the 68% credibility bands (the responses are also significant at the 90% credibility level). The monetary policy shocks are identified with sign restrictions using genuine monetary policy surprises as reflected in changes in one-year OIS rates around the ECB's monetary policy announcements as instruments. The monetary policy shocks are assumed to induce increases in the movements in OIS rates and the government bond yield of the corresponding maturity on impact and reduce economic activity over the following year. All other shocks included in the model are assumed to have a smaller absolute impact on the movements in OIS rates than the monetary policy shocks.

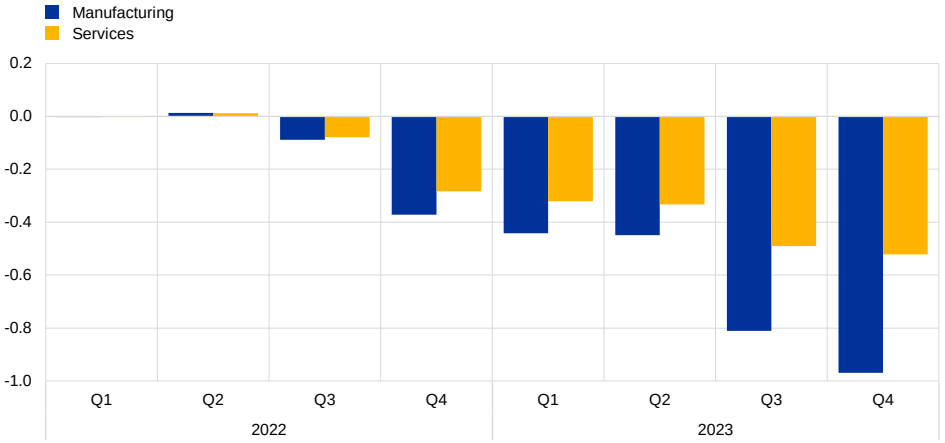
The recent tightening of monetary policy has increasingly weighed on economic activity during 2023. According to the model, the tightening induced by monetary policy shocks started to affect economic activity as early as the third quarter of 2022, when the ECB first raised interest rates, a few quarters after the first announcement of a normalisation of monetary policy at the end of 2021 (Chart D). As interest rates continued to rise and the impact of previous shocks built up over time, the negative effects of the monetary tightening intensified in the first half of 2023, with manufacturing affected at a quicker pace and to a greater extent than services. According to the model, the monetary policy effects are also likely to have increased further in the second half of 2023 as they continued to ripple through the economy, partly as a result of the significant lag in the reaction of the services sector. Importantly, these results capture only the impact of monetary policy shocks and not the broader rise in interest rates reflecting the systematic response of monetary policy to the increase in inflation. The latter should suggest a larger effect of the recent monetary policy tightening on activity, going beyond the impact of the identified monetary policy shocks.[9]

[9] For an assessment of the macroeconomic impact of the ECB's recent monetary policy tightening based on a suite of different models, see the box entitled "A model-based assessment of the macroeconomic impact of the ECB's monetary policy tightening since December 2021", *Economic Bulletin*, Issue 3, ECB, 2023.

Chart D

Actual impact of monetary policy shocks on manufacturing and services activity

(percentage changes since the fourth quarter of 2021)



Sources: Eurostat, Eurosystem, Altavilla et al., op. cit., and ECB calculations.
Notes: The chart shows BSVAR-based effects of monetary policy shocks on manufacturing and services activity from the first quarter of 2022 to the fourth quarter of 2023. The effects for the third and fourth quarters of 2023 are based on the projected effects of the estimated monetary policy shocks up to the second quarter of 2023. For details on the identification of monetary policy shocks, see the notes to Chart C.

5 A primer on measuring household income

Prepared by Johannes Gareis, Omiros Kouvavas and Pedro Neves

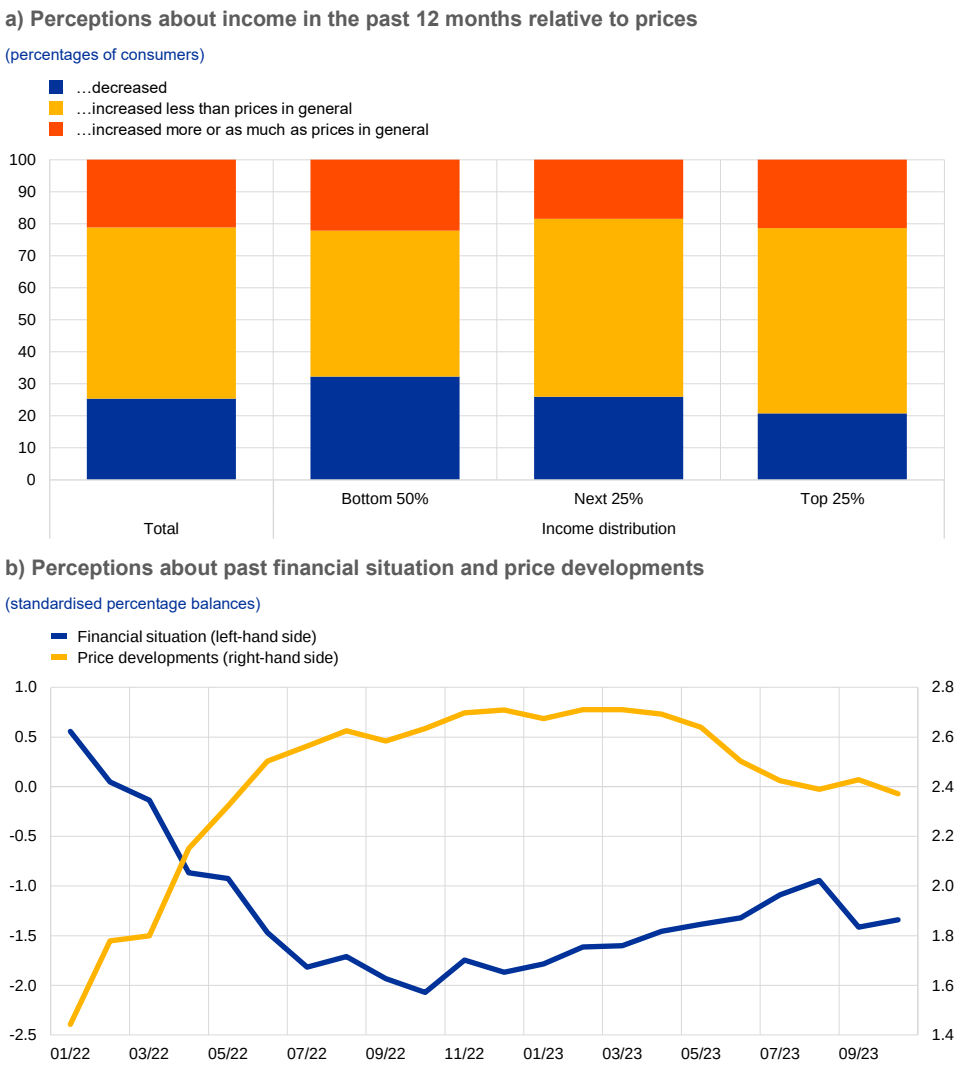
In the light of recent survey results, this box reviews the latest developments in household disposable income, focusing on some conceptual and measurement issues. Evidence from the ECB's Consumer Expectations Survey (CES) at the end of September 2023 shows that about 21% of households in the euro area reported an increase in their income above or equal to inflation in the past 12 months, while 54% of respondents reported an increase below inflation and 25% reported a decrease in their income (Chart A, panel a). This relatively negative assessment of recent real income dynamics was shared quite evenly along the income distribution.[1] Moreover, this assessment is in line with the European Commission's survey results which indicate that consumers' perceptions of their financial situation over the last 12 months have recently been significantly below their long-term average, especially since the surge in inflation following the outbreak of the war in Ukraine (Chart A, panel b). However, it contrasts with the positive momentum in household disposable income as measured in the national accounts, which increased by an average of 8.6%, year on year, in the first half of 2023 (Chart B), corresponding to an increase in real disposable income of 1.1% in the same period.[2] This divergence between survey results and national accounts data calls for a detailed look at recent trends in household disposable income and their implications for the outlook for private consumption.

1 While the percentage of low-income households reporting a decline in their income is higher than for households in other income brackets, the percentage of respondents reporting an increase in their real income is relatively low and stable across the income distribution.

2 Specifically, disposable income of households is measured in official statistics in the so-called sector accounts, which contain detailed national accounts data broken down by institutional sector, including households and non-profit institutions serving households, general government, and financial and non-financial corporations. In this box, the term "national accounts" is used when referring to official data on disposable income.

Chart A

Consumers' perceptions about developments in their income and financial situation



Sources: CES, European Commission and ECB calculations.
Notes: For panel a), CES respondents were asked at the end of September 2023 to indicate whether their total net income had risen more than prices in general, risen less than prices in general, had fallen or had changed by roughly the same amount as prices in general over the last 12 months. For panel b), households' perceptions about their past financial situation and about price developments are standardised over the period 2000-19.

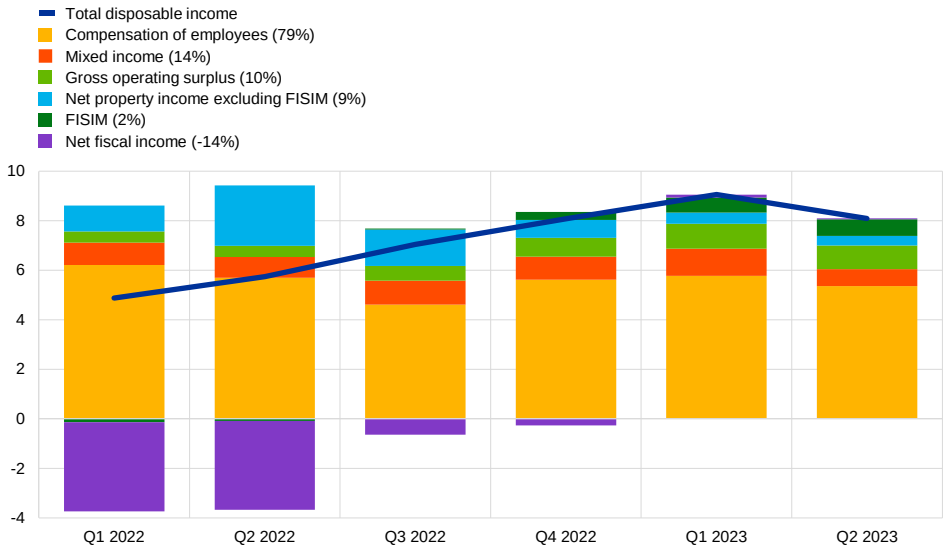
Household disposable income has benefited from rising labour income and continued strong growth in non-labour income. Both compensation of employees and all other components of household income, excluding net fiscal income, continued to rise significantly in the first half of 2023 in annual terms. Compensation of employees increased by an average of 7.1% in the period and non-labour income excluding net fiscal income rose by 8.3%, such that both components made a significant contribution to growth in disposable income (Chart B). Net fiscal income had no significant impact on household income dynamics in the second half of 2022 and the first half of 2023, while it had a negative effect on household income in the

first half of 2022.[3] A detailed look at other (i.e. non-labour) household income, excluding net fiscal income, shows that all key components increased significantly in the first half of 2023. Mixed (self-employed) income increased by 6.8%, gross operating surplus by 9.6% and net property income by 8.8%.[4] While growth in mixed income has been relatively constant, growth of the gross operating surplus has accelerated significantly, and in the first half of 2023 it reached its highest growth rate since the data series began in 1999. Net property income excluding financial intermediation services indirectly measured (FISIM) was supported by strong growth in dividends in 2022.[5] FISIM then rose strongly in the first half of 2023 and, despite accounting for a small share of total income, contributed 0.6 percentage points to household disposable income growth in the first half of 2023.

Chart B

Developments in nominal household income

(annual percentage changes and percentage point contributions)



Sources: ECB and Eurostat quarterly sector accounts and ECB calculations.
Note: The figures in parentheses are the shares of disposable income attributable to the listed income items for 2022.

3 This negative impact of net fiscal income in the first half of 2022 was related to the reversal of the coronavirus (COVID-19) support measures, which had been negatively affecting annual growth of household disposable income since the second quarter of 2021.

4 Mixed income relates closely to income from self-employment, measuring the surplus (or deficit) accruing from production by unincorporated enterprises owned by households. Property income corresponds to income arising from the ownership of financial assets or tangible, non-produced assets (in particular, land is a tangible, non-produced asset, so that rents from land form part of property income, while rents from housing, which is a tangible, produced asset, form part of mixed income). Gross operating surplus is primarily an imputed flow as it mainly contains imputed rents, which are the income that owner-occupier households would have received if they had rented out their dwelling.

5 Financial intermediation services indirectly measured (FISIM) is used in the national accounts to compute the value added of financial intermediaries (e.g. banks) for financial services provided without explicit service charges. Net property income excluding FISIM is therefore determined, among other things, by households' actual net interest income in addition to the distributed income from corporations (i.e. dividends). For a discussion of recent developments in the net interest income of households and corporations in the euro area, see the box entitled "Net interest income of households and corporations" in this issue of the Economic Bulletin. For a discussion of euro area corporate profit developments as perceived by companies, see the box entitled "Earnings calls: new evidence on corporate profits, investment and financing conditions", *Economic Bulletin*, Issue 4, ECB, 2023.

Not all components of household disposable income are available to households as positive cash flow. The measurement of household disposable income in the national accounts differs from household cash flows for conceptual reasons, as the aim of the national accounts is to measure economic activity, including household income, as comprehensively and accurately as possible. This means that data from many different sources must be combined and variables for which no direct data are available must be estimated.[6] Consequently, not all the components of disposable income measured in the national accounts are available to households as positive cash flow and may therefore not be reflected in household perceptions of their income (Table A).This mainly relates to non-labour income excluding net fiscal income, which benefited in the first half of 2023 compared with the second half of 2022 primarily from the exceptionally strong growth in the gross operating surplus and the strong rise in FISIM, neither of which generated a positive cash flow for households (Chart B).

Table A

Income components and their availability as cash flows

Income component		National accounts	Cash flow-generating?
Labour income	Compensation of employees	Wages and salaries (in cash and in kind)	Yes
		Employers' actual social contributions	No
		Employers' imputed social contributions	No
Non-labour income excluding net fiscal income	Income from self-employment	Mixed income	Yes
	Income from rental of residential and non-residential property	Mixed income	Yes
	Imputed rents	Operating surplus	No
	Interest received before FISIM allocation	Property income received	Yes
	Interest paid before FISIM allocation	Property income paid	Yes
	FISIM	Mixed income, operating surplus, net property income	No
	Other investment income (e.g. dividends) and rents (on land and subsoil resources) received	Property income received	Yes
	Property income attributed to insurance policyholders	Property income received	No
Net fiscal income		Social benefits received (other than social transfers in kind), social contributions (including employers' social contributions) and taxes on income paid, taxes on wealth paid	Yes
		Social transfers in kind received	No

Sources: Eurostat and ECB staff assessment.
Note: Employers' (actual and imputed) social security contributions do not affect household disposable income, as they are part of both employee remuneration and net fiscal income, so they increase income as part of the former and decrease income as part of the latter.

FISIM represents the financial intermediation services provided by financial institutions that are not explicitly invoiced but are relevant for the measurement of the output of banks and thus may have an impact on GDP and

6 For a discussion of the reconciliation of national accounts data on income with survey data in the context of the EU statistics on income and living conditions (EU-SILC), see Törmälehto, V., "Reconciliation of EU statistics on income and living conditions (EU-SILC) data and national accounts", *Statistical working papers*, Eurostat, 2019.

national income.[7] Household interest payments on consumer loans and mortgages and the interest earned on deposits are recorded at the interbank refinancing rate in the national accounts.[8] However, this rate differs from interest rates that households actually face, as lending rates are generally higher and deposit rates lower than the interbank rate. The difference between the interest paid and received as measured in the national accounts and the actual amounts is recorded as an implicit service charge paid by households to the financial sector, which is reported in the national accounts as FISIM. Thus, FISIM is used in the national accounts to compute the value added of financial intermediaries (e.g. banks) for financial services provided without explicit service charges. For the household sector, this indirectly measured margin is allocated both to consumption (as a financial service to households) and to disposable income (to reimburse the indirect loss of income resulting from the less favourable interest rates to which households are actually exposed), without any impact on household savings.

FISIM plays a particularly important role for household income and consumption in the current context of sharply rising interest rates.[9] FISIM has a noticeable impact on the dynamics of household disposable income at times of large changes in interest rates, such as in the current phase of monetary tightening (Chart C). As the interest rates on outstanding loans and on household deposits are generally slow to adjust, the increase in the interbank interest rate triggered by the tightening of monetary policy since the summer of 2022 has led to a strong rise in FISIM for deposits and a sharp fall in FISIM for loans. Given the size of deposits held by households compared with their loans, this has ultimately had a positive impact on households' net property income, with FISIM rising from an average of 1.7% of household disposable income in the first half of 2022 to 2.1% in the first half of 2023.

7 For the concept of FISIM and its treatment in the national accounts, see Chapter 14 of the European System of Accounts (ESA 2010) manual.

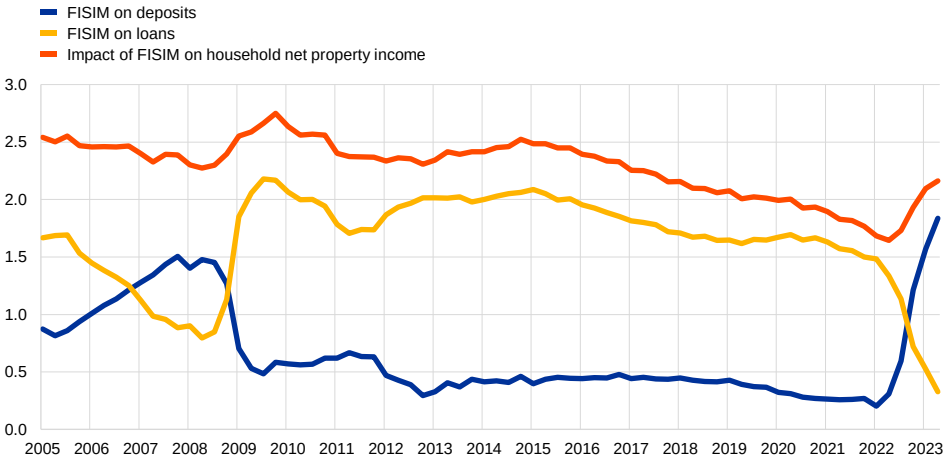
8 This is the rate at which it is assumed that both the household as lender and the household as borrower would be willing to conclude a transaction.

9 For an assessment of the impact of FISIM in the case of France with a focus on consumer prices, see INSEE, "Economic Outlook - Cooling", *Conjoncture in France*, December 2022.

Chart C

Financial intermediation services indirectly measured

(percentages of household disposable income)



Sources: ECB and Eurostat quarterly sector accounts and ECB calculations.
Notes: FISIM on deposits is calculated as the difference between the interest households received after the FISIM allocation and the interest actually received, while FISIM on loans is the difference between the interest actually paid and the interest paid after the FISIM allocation. The net impact of FISIM on the net interest income of households and thus on household net property income is then the sum of FISIM on deposits and loans. The latest observation is for the second quarter of 2023.

Household disposable income also includes imputed rents, which affect household gross operating surplus. The gross operating surplus of households as recorded in the national accounts measures the output of housing services for households' own consumption less the intermediate consumption required to produce this output (e.g. FISIM on mortgage loans) and taxes. The output of housing services for households' own consumption is the imputed rents that households would have received if they had rented out their owner-occupied dwelling.[10]

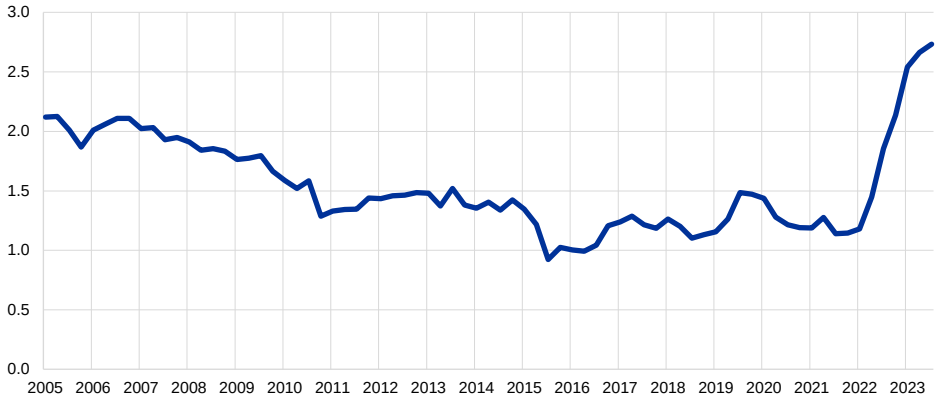
The exceptionally strong increase in the gross operating surplus in the first half of 2023 is attributable to both higher imputed rents and lower FISIM for mortgage loans. Imputed rents are likely to have been positively affected by the increase in rent inflation, which, according to the rent price index that, for the purposes of the Harmonised Index of Consumer Prices, measures rents actually paid by tenants, rose from an average of 2% in the second half of 2022 to 2.6% in the first half of 2023, reaching historically high levels (Chart D). At the same time, FISIM on mortgage loans is likely to have declined considerably in parallel with the decline in FISIM on total loans in the first half of 2023 (Chart C). Both factors, i.e. the increase in imputed rents and the decrease in FISIM on mortgage loans, can explain

[10] The inclusion of imputed rents in the national accounts is important in order to achieve full coverage of real estate activities (renters and owner-occupiers). By doing so, the international comparability of GDP and national income is ensured, as home ownership rates may differ significantly across countries. However, as imputed rents cannot be observed, an estimate must be made.

the significant increase in households' gross operating surplus in the first half of 2023.[11]

Chart D
Rent inflation

(annual percentage changes; quarterly averages)



Sources: Eurostat and ECB calculations.
Note: The latest observation is for the third quarter of 2023 and refers to October 2023.

The muted outlook for private consumption appears to be in line with the negative assessment by consumers of recent developments in real income.
Although FISIM and imputed rents are added to household disposable income in the national accounts, they do not contribute to households' cash flow and may therefore not be taken into account in households' perceptions of income. As such, these sources of income are unlikely to play a major role in developments in private consumption.[12] One indicator of the growth in household income that should come closer to what households actually perceive as income is labour income. Indeed, the deflation of compensation of employees and compensation per employee with the private consumption price deflator suggests that real income growth, as it is most likely perceived by households, was weaker than real disposable income growth as measured in the national accounts (Chart E). This, in turn, is in line with the pessimistic assessment by consumers of recent developments in real income according to surveys (as shown in Chart A) and thus the subdued outlook for private consumption.[13]

11 The fact that FISIM on mortgage loans is added to household disposable income via net property income and deducted from household income via gross operating surplus (and via mixed income for households that are actually landlords) means that it has no effect on household disposable income, so that the overall effect of FISIM on household disposable income is effectively determined by FISIM on deposits and on consumer loans. This impact does not correspond to the FISIM reported in Chart B and Chart C, which show the impact of FISIM on the net property income of households for which official data are available.

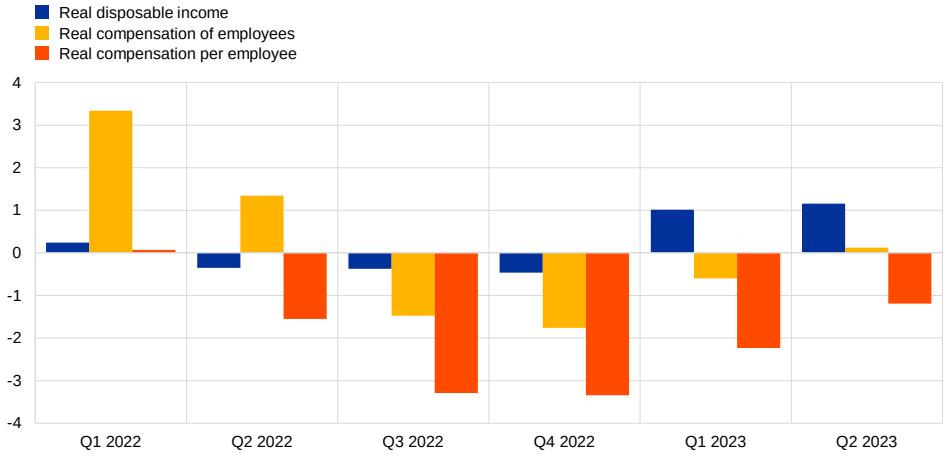
12 This is in line with the finding that the propensity to consume appears to be highest for the most liquid income items (such as labour income), and vice versa. See de Bondt, G., Gieseck, A., Herrero, P. and Zekaite, Z., "Disaggregate income and wealth effects in the largest euro area countries", *Working Paper Series*, No 2343, ECB, December 2019.

13 For an assessment of the outlook for private consumption, see the section on economic activity developments in this issue of the Economic Bulletin.

Chart E

Developments in real household income

(annual percentage changes)



Sources: Eurostat and ECB calculations.
Note: Developments in real income are derived by using the private consumption price deflator to deflate nominal income.

6 Liquidity conditions and monetary policy operations from 2 August to 31 October 2023

Prepared by Denis Lungu and Kristian Tötterman

This box describes liquidity conditions and the Eurosystem's monetary policy operations during the fifth and sixth reserve maintenance periods of 2023. Together, these two maintenance periods ran from 2 August to 31 October 2023 (the "review period").

The Governing Council raised the ECB's three policy rates by 25 basis points at each of its meetings on 27 July and 14 September 2023. These increases took effect in the fifth and sixth reserve maintenance periods of 2023 respectively. At its meeting on 27 July, the Governing Council also decided to reduce the remuneration of minimum reserves that banks are required to hold with their Eurosystem national central bank to 0%. This reduction came into force at the beginning of the sixth maintenance period.

Excess liquidity in the euro area banking system continued to decline during the review period. This decrease was due mainly to the maturing of the fifth operation under the third series of targeted longer-term refinancing operations (TLTRO III) and early repayments by banks of other TLTRO funds on 27 September 2023. To some extent, it was also the result of the fall in asset purchase programme (APP) holdings since the Eurosystem's discontinuation of the reinvestments under the programme from 1 July. However, the reduction in liquidity provision was partly offset by the continued decline in net autonomous factors that had started with the end of the negative interest rate environment in July 2022, owing primarily to a drop in government deposits.

Liquidity needs

The average daily liquidity needs of the banking system, defined as the sum of net autonomous factors and reserve requirements, decreased by €101.3 billion to €1,735.0 billion in the review period. Compared with the third and fourth maintenance periods of 2023, this was due entirely to a €101.3 billion fall in net autonomous factors to €1,570.0 billion (see the section of Table A entitled "Other liquidity-based information"), driven by a decline in liquidity-absorbing autonomous factors and an increase in liquidity-providing autonomous factors. Minimum reserve requirements remained unchanged at €165 billion.

Liquidity-absorbing autonomous factors decreased by €83.0 billion to €2,720.6 billion in the review period, owing primarily to a decline in government deposits and other autonomous factors. Government deposits (see the section of Table A entitled "Liabilities") fell on average by €32.8 billion over the review period to €222.6 billion, with most of the decline taking place in the fifth maintenance period. This decline reflects the continued normalisation in the overall volume of cash

buffers held by national treasuries and, within those buffers, an adjustment in their cash management strategies owing to the changes in the remuneration of government deposits with the Eurosystem that made it more financially attractive to place funds in the market.

More specifically, the ECB lowered the ceiling for the remuneration of government deposits held with the Eurosystem to the euro short-term rate (€STR) minus 20 basis points as of 1 May 2023. Under the ceiling concept, Eurosystem national central banks may decide to deviate from the ceiling and remunerate government deposits at a rate lower than the ceiling. For instance, the Deutsche Bundesbank set a 0% interest rate for the remuneration of domestic government deposits as of 1 October 2023. However, the downward effect of this change on the affected government deposits was offset by upward, seasonal-related changes in other government deposits. The normalisation of repo market conditions and higher repo rates relative to the €STR have also made market investment a more attractive option than deposits with the Eurosystem. The average value of banknotes in circulation decreased by €5.5 billion over the review period, down to €1,559.8 billion, reflecting a continuation of the reduction in banknote holdings observed since the ECB's policy rates were lifted out of negative territory. Other autonomous factors also declined by €44.7 billion on average. The decline reflects several changes in other sundry assets and in the revaluation account.

Liquidity-providing autonomous factors rose by €18 billion, to stand at €1,150.8 billion. Net assets denominated in euro increased by €28.5 billion in the review period. This increase was largely the result of a continued fall in liabilities to non-euro area residents denominated in euro. This in turn reflects an adjustment in the cash management strategies of customers of the Eurosystem reserve management services (ERMS), since the remuneration of deposits held under the ERMS framework was also adjusted as of 1 May 2023. Net foreign assets decreased by €10.5 billion, partially offsetting the above-mentioned decline in other autonomous factors.

Table A provides an overview of the Eurosystem's liquidity conditions, including the changes in autonomous factors discussed above.[1]

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

Table A

Eurosystem liquidity conditions

Liabilities

(averages; EUR billions)

	Current review period: 2 August 2023-31 October 2023						Previous review period: 10 May 2023-1 August 2023	
	Fifth and sixth maintenance periods		Fifth maintenance period: 2 August-19 September		Sixth maintenance period: 20 September-31 October		Third and fourth maintenance periods	
Liquidity-absorbing autonomous factors	2,720.6	(-83.0)	2,735.5	(-48.0)	2,703.3	(-32.1)	2,803.6	(-128.3)
Banknotes in circulation	1,559.8	(-5.5)	1,564.2	(-2.8)	1,554.7	(-9.5)	1,565.4	(+8.2)
Government deposits	222.6	(-32.8)	222.5	(-31.9)	222.7	(+0.3)	255.4	(-114.3)
Other autonomous factors (net)[1]	938.2	(-44.7)	948.8	(-13.3)	925.8	(-23.0)	982.9	(-22.3)
Current accounts above minimum reserve requirements	9.5	(-5.1)	9.0	(-3.3)	10.0	(+1.0)	14.5	(-6.8)
Minimum reserve requirements[2]	165.0	(-0.0)	165.3	(+0.2)	164.5	(-0.7)	165.0	(-0.3)
Deposit facility	3,615.1	(-300.3)	3,647.4	(-57.0)	3,577.4	(-70.1)	3,915.4	(-130.0)
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.

Assets

(averages; EUR billions)

	Current review period: 2 August 2023-31 October 2023						Previous review period: 10 May 2023-1 August 2023	
	Fifth and sixth maintenance periods		Fifth maintenance period: 2 August-19 September		Sixth maintenance period: 20 September-31 October		Third and fourth maintenance periods	
Liquidity-providing autonomous factors	1,150.8	(+18.0)	1,139.5	(+19.6)	1,164.0	(+24.5)	1,132.8	(+61.8)
Net foreign assets	927.5	(-10.5)	924.3	(-3.4)	931.2	(+6.9)	938.0	(+6.1)
Net assets denominated in euro	223.3	(+28.5)	215.2	(+23.1)	232.8	(+17.7)	194.8	(+55.8)
Monetary policy instruments	5,359.5	(-406.7)	5,417.9	(-128.1)	5,291.5	(-126.4)	5,766.2	(-327.1)
Open market operations	5,359.4	(-406.7)	5,417.8	(-128.1)	5,291.4	(-126.4)	5,766.1	(-327.2)
Credit operations	568.2	(-329.3)	606.6	(-86.3)	523.5	(-83.1)	897.5	(-274.7)
MROs	6.8	(+0.5)	5.6	(-5.3)	8.1	(+2.6)	6.3	(+5.0)
Three-month LTROs	8.2	(+4.3)	8.9	(+3.4)	7.4	(-1.5)	3.8	(+1.4)
TLTRO III	553.3	(-334.2)	592.2	(-84.4)	508.0	(-84.1)	887.5	(-281.1)
Outright portfolios[1]	4,791.2	(-77.3)	4,811.2	(-41.8)	4,767.9	(-43.3)	4,868.6	(-52.5)
Marginal lending facility	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. "MROs" denotes main refinancing operations and "LTROs" denotes 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 August 2023-31 October 2023						Previous review period: 10 May 2023-1 August 2023	
	Fifth and sixth maintenance periods		Fifth maintenance period: 2 August-19 September		Sixth maintenance period: 20 September-31 October		Third and fourth maintenance periods	
Aggregate liquidity needs[1]	1,735.0	(-101.3)	1,761.4	(-67.8)	1,704.1	(-57.3)	1,836.3	(-190.4)
Net autonomous factors[2]	1,570.0	(-101.3)	1,596.1	(-68.0)	1,539.6	(-56.6)	1,671.3	(-190.1)
Excess liquidity[3]	3,624.5	(-305.3)	3,656.4	(-60.2)	3,587.3	(-69.0)	3,929.8	(-136.8)

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.

Interest rate developments

(averages; percentages and percentage points)

	Current review period: 2 August 2023-31 October 2023				Previous review period: 10 May 2023-1 August 2023			
	Fifth maintenance period: 2 August-19 September		Sixth maintenance period: 20 September-31 October		Third maintenance period		Fourth maintenance periods	
MROs	4.37	(+0.49)	4.25	(+0.25)	4.50	(+0.25)	3.88	(+0.61)
Marginal lending facility	4.62	(+0.49)	4.50	(+0.25)	4.75	(+0.25)	4.13	(+0.61)
Deposit facility	3.87	(+0.49)	3.75	(+0.25)	4.00	(+0.25)	3.38	(+0.61)
€STR	3.767	(+0.492)	3.652	(+0.251)	3.901	(+0.249)	3.275	(+0.607)
RepoFunds Rate Euro	3.797	(+0.529)	3.687	(+0.286)	3.926	(+0.239)	3.267	(+0.607)

Sources: ECB, CME Group and Bloomberg.
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 €406.7 billion to €5,359.5 billion during the review period (Chart A). The reduction in liquidity was driven primarily by a decline in credit operations.

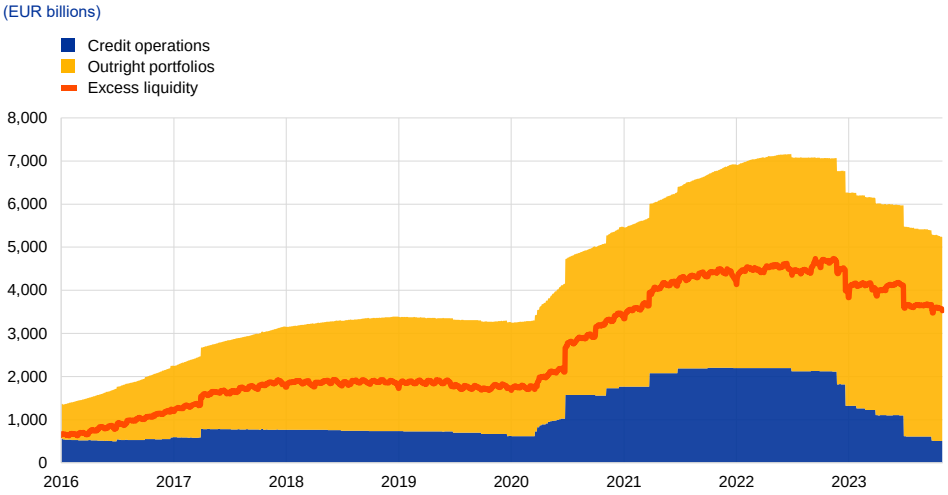
The average amount of liquidity provided through credit operations fell by €329.3 billion to €568.2 billion during the review period. This decrease largely reflects the decline in outstanding TLTRO III amounts owing to i) the maturing of the fifth operation under TLTRO III (€66.7 billion) and early repayments of other TLTRO funds (€34.2 billion) on 27 September, and ii) the maturing of the fourth operation under TLTRO III (€476.8 billion) and early repayments of other TLTRO funds (€29.5 billion) on 28 June, which were still affecting the average level of credit operations in the previous review period. Increasing on average by €0.5 billion and €4.3 billion respectively, the main refinancing operations and three-month longer-term refinancing operations offset only a small part of the liquidity drained by TLTRO III

repayments. The limited increases in these operations reflect banks' comfortable liquidity positions and the availability of alternative funding sources.

The average amount of liquidity provided via holdings of outright portfolios decreased by €77.3 billion during the review period. This decrease was due to the discontinuation of reinvestments of the principal payments from maturing securities under the APP from 1 July 2023. Under the pandemic emergency purchase programme, the principal payments from maturing securities have been fully reinvested since net purchases were discontinued at the end of March 2022.[2]

Chart A

Changes in liquidity provided through open market operations and excess liquidity



Source: ECB.
Note: The latest observations are for 31 October 2023.

Excess liquidity

Average excess liquidity decreased by €305.3 billion, to reach €3,624.5 billion (Chart A). Excess liquidity is the sum of the reserves banks hold in excess of 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 the liquidity needs of banks to cover minimum reserves. Since peaking at €4,748 billion in November 2022, average excess liquidity has decreased steadily, owing mainly to maturing operations and early repayments under TLTRO III. The discontinuation of reinvestments under the APP from 1 July 2023 has also been contributing to the decline.

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 outright portfolios.

Interest rate developments

The €STR increased by 47.8 basis points, from 3.404% on 1 August, the last day of the previous review period, to 3.882% on 31 October, the last day of the current review period, reflecting the increases in the ECB's policy rates.[3] The pass-through of the policy rate increases that took effect in August and September 2023 to unsecured overnight money market rates was immediate and complete. The end-of-quarter and end-of-month effects on the €STR were slightly more pronounced in September and October. This can be attributed to attempts by banks to optimise their minimum reserve base with a view to reducing their reserve requirements for the seventh and eighth reserve maintenance periods of 2023 respectively. The €STR traded at 12 and 11.8 basis points below the deposit facility rate at the end of September and October respectively, which was slightly higher than the average spread of 10.8 basis points for the quarter-ends and month-ends in 2023.

The euro area repo rate, as measured by the RepoFunds Rate Euro index, increased by 49.6 basis points, from 3.438% on 1 August to 3.934% on 31 October. Similarly to the unsecured money market, the pass-through of the ECB's policy rate hikes to the secured money market was immediate and complete. The functioning of the repo market remained orderly owing to several factors, including higher net issuance since the beginning of the year and the release of mobilised collateral on the back of the maturing TLTROs, as well as the decline in the outstanding APP holdings.

[3] The rate on 31 October was influenced by the end-of-month effect in that month.

7 Net interest income of households and firms[1]

Prepared by Gabe de Bondt, Georgi Krustev, Michal Slavik, and Mika Tujula

This box focuses on developments in the net interest income of households and firms amid rising interest rates. After a decade of low interest rates the ECB started a series of policy rate hikes in July 2022. Changes in policy rates affect the interest rates received on interest-bearing assets, such as bank deposits, and those paid on interest-bearing liabilities, such as loans and bonds. These, in turn, affect the interest income received and paid by households and firms, as does the size, remaining maturity and time to repricing of their interest-bearing assets and liabilities. Net interest income, i.e. interest received minus interest paid, captures a direct channel through which ECB policy rate changes are transmitted to savers and borrowers via the interest rates for the assets and liabilities they hold.[2] This is in addition to the incentives provided by the interest rates offered on new loans and savings instruments, as well as other transmission channels affecting households and firms that are beyond the scope of this box.[3]

Households and firms have had negative net interest income at the aggregate euro area level over recent years. Similarly, sectors such as the general government sector and, to a much lesser extent, the rest of the world have also had negative net interest income. This is in stark contrast to financial corporations, which have generated high positive net interest income. Since 2007 interest paid has outweighed interest received by up to 1% of GDP for households in the euro area and up to 2.5% for firms (Chart A). The adjustment of net interest income in the latest ECB interest rate hiking cycle differs across households and firms. Net interest income of euro area firms as a share of GDP has declined by 0.3 percentage points since the end of 2021, while the net interest income of households has increased by 0.1 percentage points. This contrasting development reflects a more gradual repricing of the interest paid by households on their outstanding stock of debt

1 This text has been updated on 30 January 2024 by deleting text associated with household net interest income developments in Spain. The previous version contained an error in Chart C for households in Spain, which led to an overstatement of developments in Spain.

2 The focus of this box is on net interest income before the allocation of financial intermediation services indirectly measured (FISIM), as this more accurately reflects the effective interest rates encountered for loans and deposits. This is unlike the measurement of net interest income in the national accounts, which is recorded after FISIM allocation, meaning interest paid and interest received are computed as if deposits and loans are paid based on a reference rate, or the interbank refinancing rate. FISIM is used in the national accounts to compute the value of intermediation services provided by financial institutions that do not have explicit service charges. For more information, see Chapter 14 of Regulation (EU) No. 549/2013 of the European Parliament and of the Council of 21 May 2013 on the European system of national and regional accounts in the European Union (OJ L 174, 26.6.2013, p. 1), and "Household Income", *Economic Outlook*, INSEE, 15 December 2022.

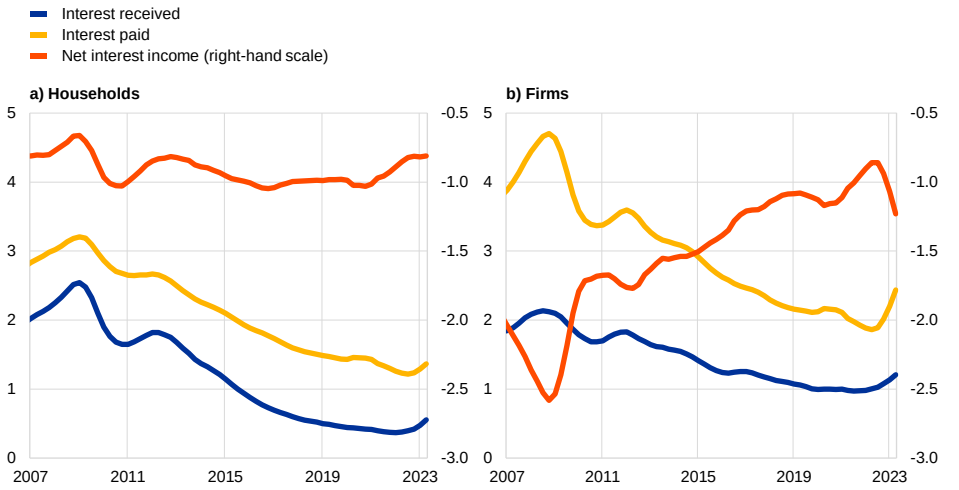
3 For more information on this topic, see the box entitled "Low interest rates and households' net interest income", *Economic Bulletin*, Issue 4, ECB, 2016. For a description of the main monetary policy transmission channels, see Lane, P. R., "The banking channel of monetary policy tightening in the euro area", remarks at the Panel Discussion on Banking Solvency and Monetary Policy, NBER Summer Institute 2023 Macro, Money and Financial Frictions Workshop, 12 July 2023.

compared to firms, which largely relates to households having a higher share of fixed-rate loans.[4]

Chart A

Euro area interest received, interest paid and net interest income of households and firms

(four-quarter flows in percentage of nominal gross domestic product)



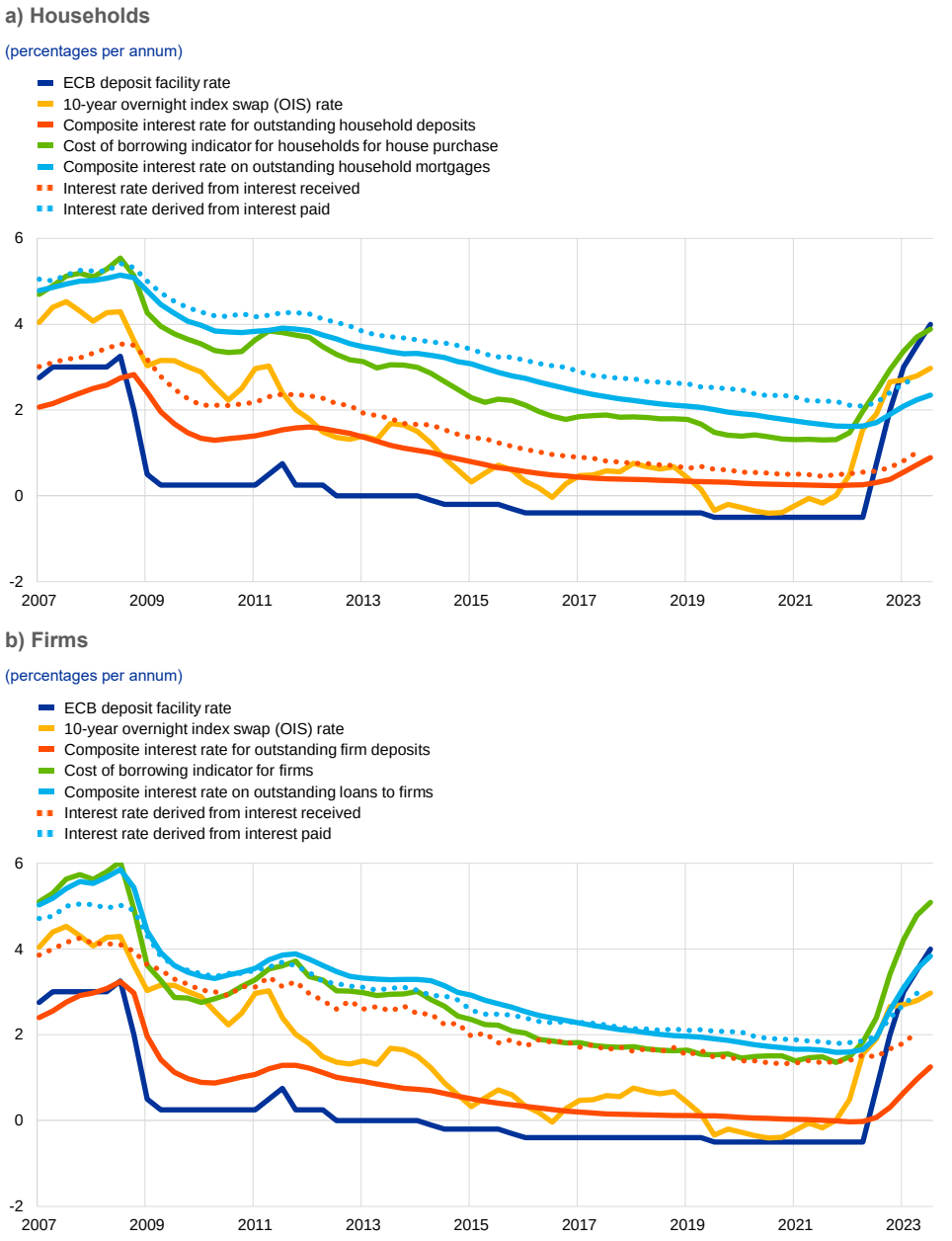
Sources: Eurostat and ECB quarterly sector accounts (QSA) data and authors' calculations.
Note: The latest observations are for the second quarter of 2023.

The difference between the interest rates received on assets and those paid on liabilities is an important driver of net income. Despite a positive nominal net asset position, the negative net interest income of households at the aggregate euro area level indicates that the average interest rate paid on outstanding debt is higher than the average interest rate received on outstanding deposits due to the maturity transformation services provided by financial corporations and the associated financial intermediation margins (Chart B). In terms of dynamics, since the end of 2021 euro area household net interest income has benefited from the gradual adjustment in rates for outstanding amounts of mortgages due to their longer durations. This is in spite of the fast increase observed in mortgage rates for new business. Although households are actively rebalancing their asset portfolios towards time deposits and debt securities, the interest received has been dampened by the high share of savings that are held in overnight deposits. These tend to have lower remuneration and are less reactive to policy rate changes. The interest rate derived from interest income received by households follows a similar pattern to the composite interest rate for outstanding household deposits. A comparable picture emerges for the interest rates paid and received by firms, though a much higher interest rate is derived from the interest income received compared with the composite interest rate for outstanding deposits. These deposits only account for around a third of firms' interest-bearing assets, and the majority relate to higher-yielding intercompany loans.

4 For the share of fixed-rate loans for households and firms in the euro area, see Lane, P. R., op. cit.

Chart B

Interest rates for deposits and loans to euro area households and firms



Sources: Eurostat and ECB QSA data, MFI interest rate data, BSI data and authors' calculations.
Notes: The latest observations are for the second quarter of 2023 for the derived interest rates, and the third quarter of 2023 for the other items. The composite deposit rate for households is a weighted average of the interest rates for overnight deposits, deposits with agreed maturity and deposits redeemable at notice. The composite deposit rate for firms is a weighted average of the interest rates for overnight deposits, deposits with agreed maturity and repurchase agreements, with their corresponding weights.

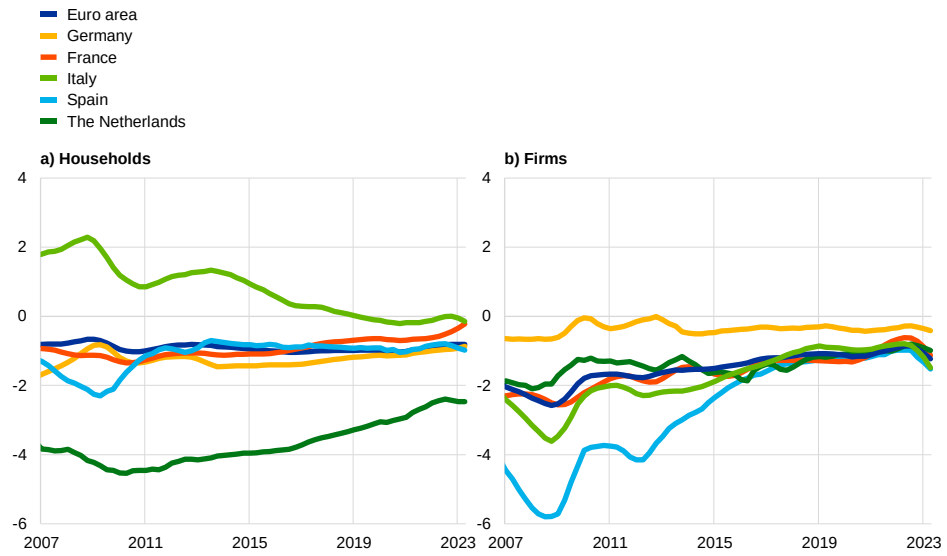
Net interest income at the euro area level masks striking cross-country differences, which primarily reflect differing net asset positions between sectors. Of the five largest euro area countries, household net interest income is notably more negative in the Netherlands (Chart C). In 2023 household net interest income was around -2% of GDP in the Netherlands, whereas the percentage was close to zero in the other large euro area countries. Italian households are at the other end of the spectrum, with long-standing positive net interest income that has

only turned slightly negative in 2020. Looking at recent quarters, household net interest income has been relatively flat in all the largest euro area countries. Net interest income for firms has fallen in all countries since the rate hiking cycle began in 2022, reflecting a large amount of corporate debt with short maturities or variable rates in aggregate, albeit with significant differences across countries.

Chart C

Net interest income in the largest euro area countries

(four-quarter flows in percentage of nominal gross domestic product)



Sources: Eurostat and ECB QSA data and authors' calculations.
Note: The latest observations are for the second quarter of 2023.

Net interest-bearing assets have also been a major driver of net interest income developments and display striking diversity across countries. For households, interest-bearing assets outweigh liabilities in all the largest euro countries apart from the Netherlands (Chart D).[5] Net interest-bearing assets have been consistently higher in Italy than in the other large euro area countries, reflecting a lower level of debt and higher holdings of interest-bearing assets, particularly debt securities issued by the general government. However, net interest-bearing assets as a percentage of GDP have declined in Italy since the end of 2009. This reflected a drop in the holdings of debt securities, which explains the convergence of the net interest income towards the euro area total. For the Netherlands, the past ubiquity of interest-only mortgages explains why liabilities exceed interest-bearing assets and why net interest income is below that of the euro area as a whole. Net interest-bearing assets have increased in Spain since the global financial crisis, reflecting a decline in indebtedness that, together with the high share of variable rate loans and declining interest rates, has led to an improvement in net interest income. For firms, interest-bearing liabilities outweigh assets in all the largest euro area countries. Net interest-bearing assets, as a percentage of GDP, have remained relatively

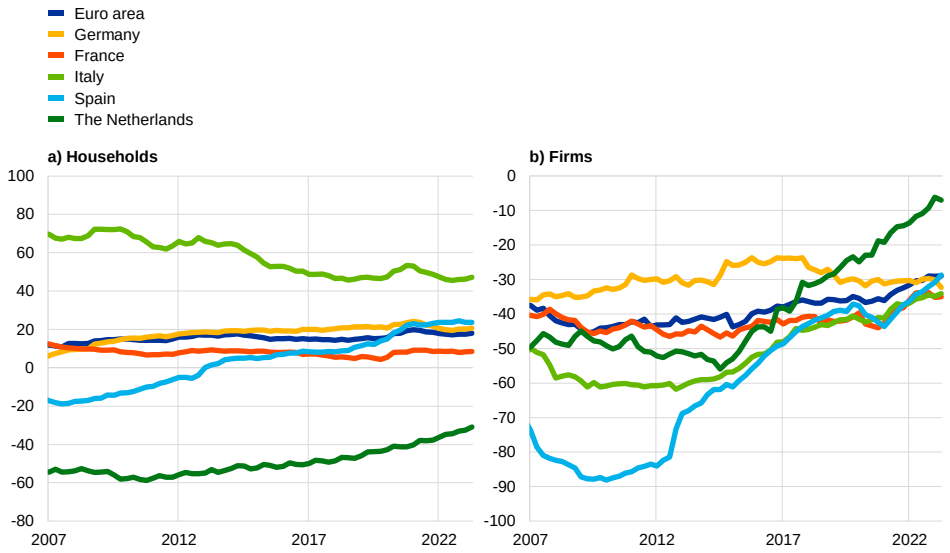
5 In addition to deposits and debt securities, households can also save by purchasing shares, investment fund shares, life insurance, pension products and real estate. Net asset positions for households, namely the difference between total assets held and total debt liabilities, stood between 420% and 607% of GDP in the five largest euro area member countries in the second quarter of 2023.

unchanged in Germany and France over the last decade, but steadily trended upwards in Spain, Italy and the Netherlands. In Spain and Italy, the improvement in net interest income since 2012 is primarily explained by a decline in indebtedness, together with high share of variable rate debt and lower interest rates.

Chart D

Net interest-bearing assets in the euro area and in the largest euro area countries

(outstanding amounts as a percentage of four-quarter flows of nominal gross domestic product)



Sources: Eurostat, ECB QSA data and authors' calculations.
Notes: Net interest-bearing assets are an institutional sector's total interest-bearing assets minus its debt liabilities. Interest-bearing assets include deposit holdings, directly held debt securities and loans granted. In the case of households, debt liabilities include loans received from all institutional sectors. For firms, debt liabilities also include issued debt securities. The latest observations are for the second quarter of 2023.

To summarise, the effect of interest rate increases on the net interest income depends on whether the institutional sector, on a net basis, acts as a lender or borrower. Rising rates negatively affect institutional sectors that need to borrow funds due to higher financing costs; conversely, net savers earn more because they can profit from higher interest rates on their assets. Moreover, changes in the interest rates received and paid on the stock of assets and liabilities occur only gradually, as variable rate instruments are repriced and legacy fixed-rate instruments mature. The net interest income of euro area households has increased by 0.1% of GDP since the end of 2021 and has slightly stimulated private consumption expenditure through the marginal propensity to consume out of interest income. However, its positive effect on consumption has been smaller than the negative effect of higher interest rates transmitted through other channels. In contrast, the net interest income of firms has declined by 0.3% of GDP since the end of 2021, resulting in lower investment due to cash flow sensitivity.

8 Monetary dynamics during the tightening cycle

Prepared by Ramón Adalid, Max Lampe and Silvia Scopel

The policy rate hiking cycle that started in mid-2022 has led banks to increase the deposit rates they offer. So far, the ECB has raised its three key interest rates by 450 basis points over the tightening cycle. Compared with the levels seen at the end of May 2022, shortly before the intention to hike interest rates was announced at the June press conference, interest rates on newly agreed time deposits have risen by 372 basis points and those on overnight deposits by 50 basis points.

Nevertheless, deposit rates remain somewhat below historical norms when compared with policy rates, especially for households and mainly for their overnight deposits. When interest rates are positive, the remuneration on time deposits tends to closely follow the policy rate.[1] In October 2023 euro area firms and households were on average offered an annual interest rate of 3.70% and 3.27% respectively, for newly agreed time deposits with a maturity of up to two years. This implies spreads relative to the policy rate of -30 and -73 basis points respectively. In October the spread for firms' time deposits was within the historical range while that for households' time deposits was somewhat wider but not unprecedented, being broadly similar to that observed in early 2001, at the height of the 2000-01 tightening cycle. In contrast to time deposits, the remuneration on overnight deposits typically remains well below the policy rate when interest rates are well above zero, reflecting the payment, liquidity and convenience services offered by sight deposits (Chart A, panel a).[2] The associated remuneration also moves slowly, meaning that the size of the resulting spread relative to the policy rate tends to widen during tightening cycles. This widening is consistent with the notion that high switching costs give banks market power, especially in the sight deposit market.[3] In October 2023 these deposits offered a negative spread considerably wider than in the 2007-08 period, when rates stabilised at the peak of hiking cycle but less so compared with the plateau reached in the 2000 cycle. However, it should be taken into account that deposit remuneration in the 2007-08 period might have been partly supported by banks' liquidity needs as the global financial crisis started to unfold. Symmetrically, the dynamics in the current cycle appear to be also partly affected by the low funding needs of banks in the context of weak lending and less competition in some segments of the deposits market.[4]

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1 The policy rate is the interest rate that a central bank uses to signal its monetary policy stance. The main refinancing rate was used as the reference rate to calculate the spreads relative to deposit rates in the first decade of the euro as, in an environment of very low levels of excess liquidity, the rate on the main refinancing operations was the main reference for market interest rates. For most of the past decade, by contrast, the interest rate on the deposit facility has become the main anchor for market interest rates in the prevailing environment of ample excess liquidity. Accordingly, that rate has been used to calculate the spreads relative to deposit rates for that period.

2 See Drechsler, I., Savov, A. and Schnabl, P., "The deposits channel of monetary policy", *The Quarterly Journal of Economics*, Vol. 132, No 4, 2017, pp. 1819-1876.

3 See Polo, A., "Imperfect pass-through to deposit rates and monetary policy transmission", *Staff Working Paper*, No 933, Bank of England, 2021.

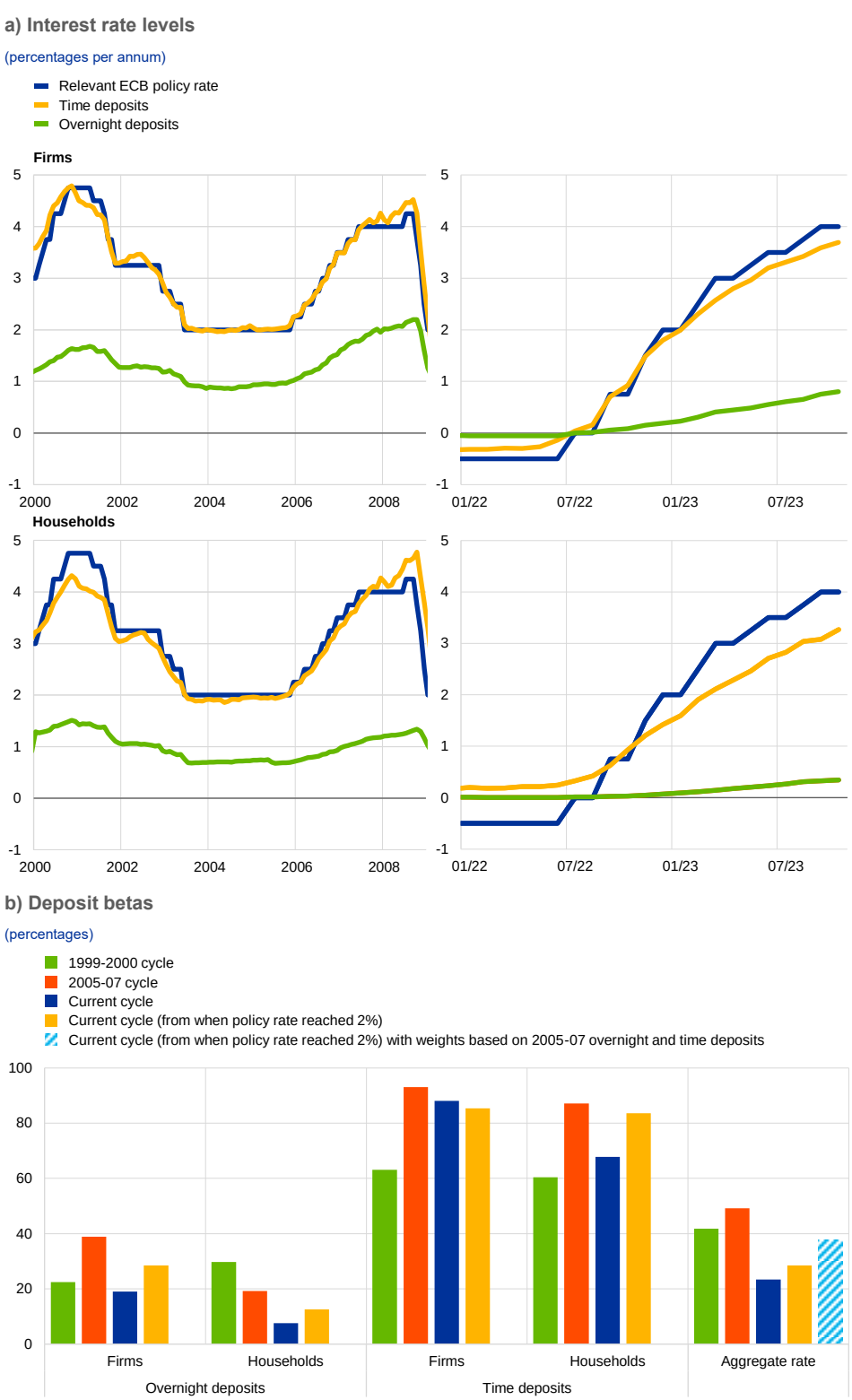
4 See Mayordomo, S. and Roibás, I., "The pass-through of market interest rates to bank interest rates", *Documentos Ocasionales*, No 2312, Banco de España, 2023.

Accumulated changes in deposit rates have been relatively weak, partly because deposit rates were above the policy rate during the time of negative interest rates preceding the current cycle, but also because of a genuine weaker transmission to overnight deposit rates for households. The ratio of the increase in deposit rates to the increase in policy rates is a measure widely used to compare the strength of the interest rate pass-through to deposit rates across tightening cycles. This ratio is usually referred to as the deposit beta. However, this measure is sensitive to the starting point, especially if the spread between the deposit rate and the policy rate at that point differs from the historical norm. This was the case at the beginning of the current tightening cycle as, in mid-2022, the spreads between deposit rates and policy rates were negative (Chart A, panel a, right graph). These inverted deposit spreads reflect the fact that banks were reluctant to pass on the negative interest rates to their retail depositors because of legal barriers and litigation risks or concerns about deposit withdrawals.[5] The end of the period of negative and very low interest rates allowed the spreads between the policy rate and the deposit rates to return towards their historical patterns, marking a period when policy rate hikes were matched by only minor increases in deposit rates. For this reason, it is important to exclude the period of low policy rates when using deposit betas to compare the strength of the deposit rate pass-through against past episodes. It would be possible, for example, to exclude the period when the policy rate was below 2%, the level at the start of the previous cycle. If this is done, deposit betas increase for all overnight deposits, as well as for those time deposits held by households. The fact that firms and households currently hold a higher share of overnight deposits than they used to is another factor that affects aggregate deposit betas, i.e. those that weight deposit rate increases across various deposit types based on their outstanding amounts (Chart B, panel b). Using the deposit shares from the 2005-07 tightening cycle (instead of the current shares) to blend the remuneration on overnight deposits and time deposits causes the resulting deposit beta to approach that of the previous hiking cycles, although it still remains somewhat lower (Chart A, panel b). This is mostly due to the genuinely weaker transmission of policy rate hikes to overnight household deposits.

[5] See the article entitled "Negative rates and the transmission of monetary policy", *Economic Bulletin*, Issue 3, ECB, 2020.

Chart A

Interest rate pass-through in the euro area



Source: ECB.
Notes: Time deposits are the rates on newly agreed contracts with a maturity of up to two years. Deposit betas are defined as the ratio of the increase in deposit rates against the increase in policy rates. The latest observations are for October 2023.

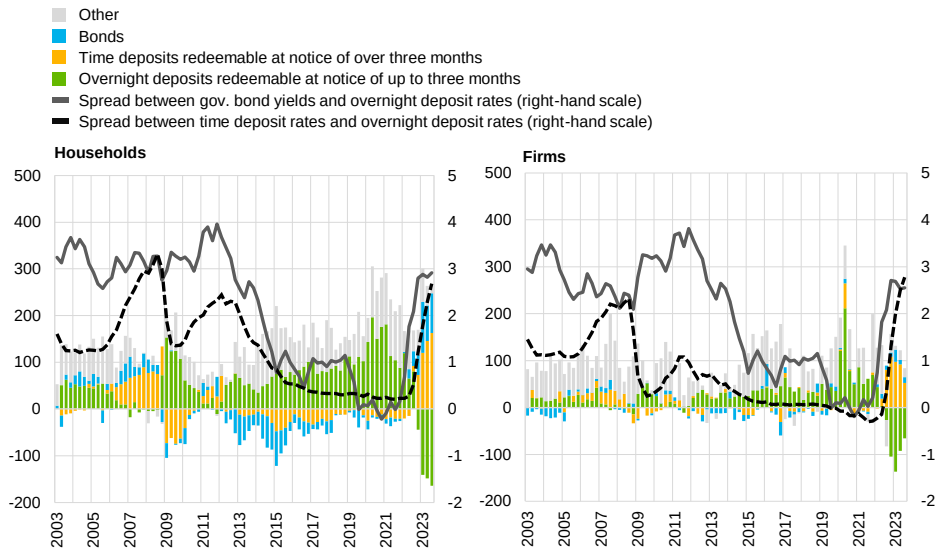
The increased remuneration of time deposits and bonds after a long period of low or negative interest rates has incentivised shifts to these instruments from overnight deposits and other low-remuneration deposits. During the period of low interest rates, the opportunity cost of holding overnight deposits was very low, causing households and firms to accumulate virtually all of their new money balances in overnight deposits (Chart B, panel a). The current monetary policy tightening, and its transmission to deposit rates and yields on other financial assets, has increased the opportunity cost of holding overnight deposits to levels similar to those seen in previous hiking cycles. This has led firms and households to move a significant portion of their unusually large stock of overnight deposits to time deposits and bonds. That stock has contracted compared with mid-2022 but remains high by historical standards. This is all the more evident for households than for firms (Chart B, panel b),[6] which could explain the moderation in deposit shifts by firms observed over the past two quarters.

[6] The time period Q4 2005 is taken as the relevant reference for comparison because it is the start of the 2005 tightening cycle. Using the average over a longer period (such as the one used in Chart A, panel a, right graph) as a benchmark would not change the conclusion that the weight of overnight deposits is still substantially higher than in the past, especially for the household sector.

Chart B
Portfolio rebalancing

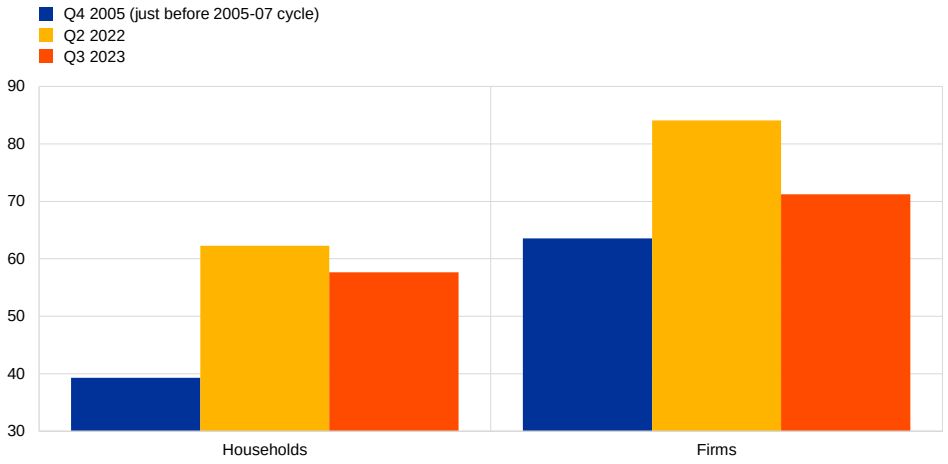
a) Financial investment by firms and households

(left-hand scale: quarterly flows, EUR billions; right-hand scale: percentage points)



b) Overnight deposits

(percentage share of total deposit holdings)



Source: ECB.

In general, in addition to affecting portfolio decisions by households and firms, changes in monetary policy affect money creation in a number of ways. First, via credit creation as, when banks provide credit, this is immediately reflected in an increase in the deposit balances of the borrowers, which they can then use for their payments and other transactions.[7] Second, in a similar fashion, broad money balances increase when the central bank acquires assets from euro area residents other than banks, and also when non-residents acquire goods, services and financial

[7] This does not imply that banks can create unlimited deposits. First, the deposits created may well end up at other banks. Second, in order to grant credit, banks need among other things to take into account their broader funding and solvency position and the risk inherent in their exposures and comply with regulatory constraints.

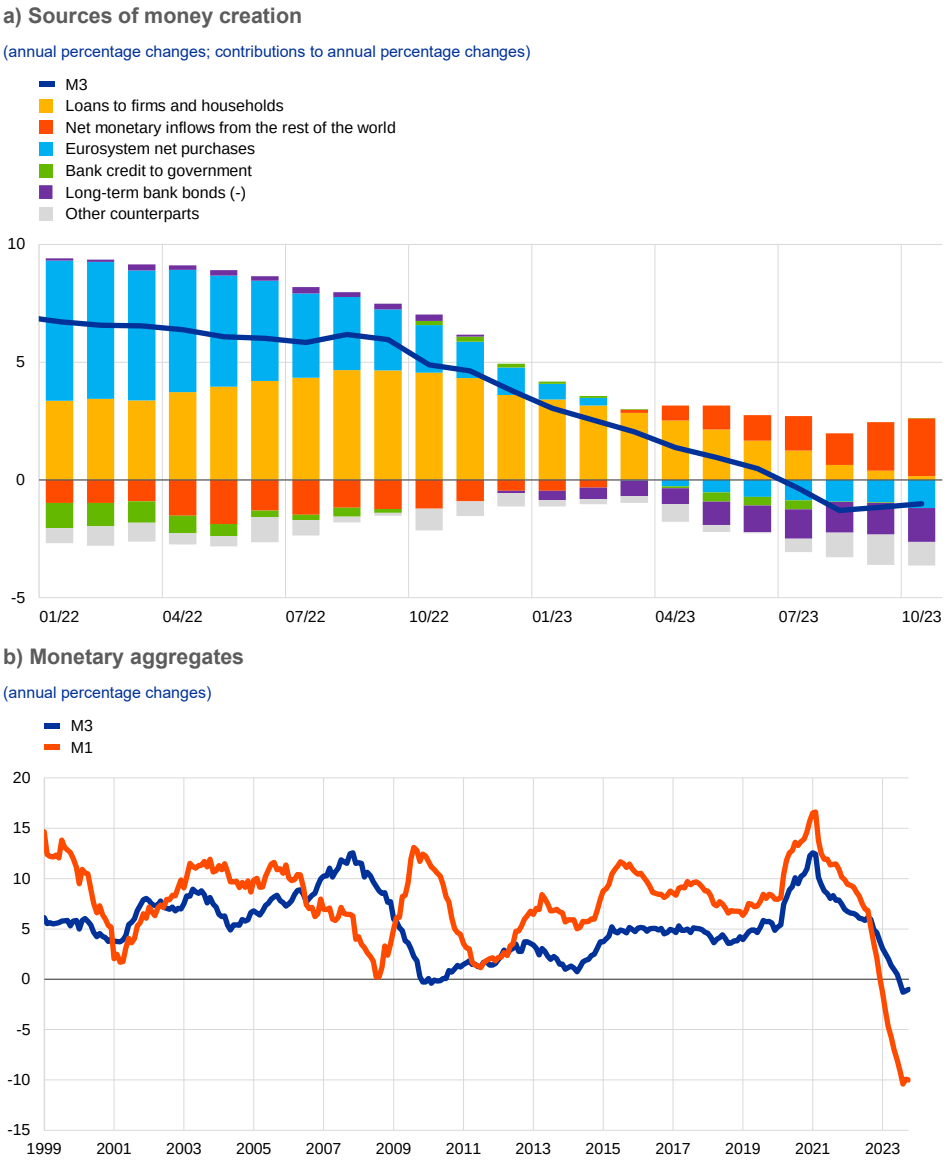
assets from euro area residents other than banks.[8] Finally, central bank credit to banks can also lead to money creation to the extent that it substitutes for bond funding, thereby freeing up funds that depositors can keep in their accounts.

The current monetary policy tightening has weakened broader money creation, pushing it into negative territory at a historically low level. Since the current tightening cycle started, higher interest rates have brought down both loan demand and loan supply considerably. This has drastically reduced credit volumes, which is a typical source of money creation. Furthermore, the contraction of the Eurosystem balance sheet has reinforced the decline in credit supply and has had a direct dampening effect on M3 via two channels: (i) TLTRO repayments, which incentivise banks to issue long-term bonds, thus reducing money balances as depositors acquire these bonds; and (ii) the progressive redemptions of the asset purchase programme portfolio, which remove money from circulation.[9] As a result, the contribution to annual M3 from loans to firms and households fell from 4 percentage points in mid-2022 to around zero in October 2023, while bank bond issuance is currently sapping around 1.5 percentage points from the annual M3 stock. The direct contribution from Eurosystem purchases turned negative, from close to 6 percentage points in early 2022 to -1 percentage point in October 2023. This has, however, largely been offset by purchases of government bonds by foreign investors, although household purchases of bonds are currently weighing somewhat on monetary dynamics. The recovery in the current and capital accounts surplus, which also reflects the weakening of domestic demand for foreign goods, has also further supported net monetary inflows from abroad since late 2022 (Chart C, panel a).

8 M3 predominantly comprises short-term and liquid liabilities issued by monetary financial institutions and held by the money holding sector.

9 See Lane, P., "The banking channel of monetary policy tightening in the euro area", remarks at the Panel Discussion on Banking Solvency and Monetary Policy, NBER Summer Institute 2023 Macro, Money and Financial Frictions Workshop, 12 July 2023.

Chart C
Monetary aggregates



Source: ECB.
Note: The latest observations are for October 2023.

Deposit shifts and the contraction of broad money have resulted in negative growth of unprecedented size in the narrow monetary aggregate M1. As overnight deposits are the main component of M1, shifts away from them have resulted in an unprecedented contraction of this aggregate (by roughly 10% since the summer; Chart C, panel b). Given that M1 growth has historically been a good predictor of real GDP growth, this has raised concerns about a further slowdown in economic activity.[10] In part, this connection operates via consumption, savings and investment decisions, because M1 is a relevant indicator of the degree of liquidity in the economy. In the current situation, however, the ongoing shift away from

[10] See the box entitled "The predictive power of real M1 for real economic activity in the euro area", *Economic Bulletin*, Issue 3, ECB, 2019.

overnight deposits and the previous strong growth of M1 since 2015 – which was largely linked to the combination of net asset purchases and low interest rates – may be blurring the usual signal. In other words, a reduction in M1 resulting from a portfolio shift away from overnight deposits should, in principle, have a more contained impact on agents' spending capacity. It should therefore have a smaller negative impact on GDP than that of a typical decline in M1, particularly given that the stock of overnight deposits remains relatively high by historical standards. However, this does not mean that M1 should be dismissed altogether, especially if accompanied by tensions in financial markets and heightened demand for liquidity.

Article

1 Central bank money settlement of wholesale transactions in the face of technological innovation

Prepared by Holger Neuhaus and Mirjam Plooij

1 Introduction

Through its TARGET Services, the Eurosystem facilitates the settlement of wholesale financial transactions in central bank money, the safest and most liquid settlement asset. The possibility to settle such transactions in central bank money (that is, in the form of reserves held by financial institutions at the central bank) helps to reduce risks to the financial system and to support financial stability and trust in the currency. The provision of settlement infrastructures is part of how the Eurosystem carries out its basic task of promoting the smooth operation of payment systems.[1]

The Eurosystem is continuing to modernise its settlement infrastructures and adapt them to changing user needs. The Eurosystem is committed to providing euro central bank money for settlement via infrastructures that are fit for purpose and that make use of a single central bank money liquidity pool; even if banks hold several accounts within the TARGET Services, they should be able to manage their liquidity across these accounts such that they function, in effect, as a single pool. In line with this commitment, the Eurosystem has consolidated, from a technical and functional perspective, its wholesale payments (formerly TARGET2, now replaced by T2) and securities settlement services (T2S). It also plans to launch a unified system – the Eurosystem Collateral Management System – for managing assets used as collateral in Eurosystem credit operations, replacing the current systems used by national central banks.

The Eurosystem is analysing the potential impact of emerging technologies, including distributed ledger technology (DLT), on the settlement of wholesale financial transactions. This work was initiated in response to increasing interest within the financial industry in the possible applications of DLT in areas such as securities-related transactions settlement on a delivery versus payment (DvP) basis and cross-currency payments settlement on a payment versus payment (PvP) basis. Should there be a significant adoption of DLT by market participants, this may require changes on the side of the central banks, to ensure that wholesale transactions can continue to be settled in central bank money.

The initial analysis by the Eurosystem consisted of market outreach and analysing possible responses in the event of a significant uptake of DLT. The

[1] Article 127 of the Treaty on the Functioning of the European Union (OJ C 326, 26.10.2012, p. 47).

Eurosystem asked financial market stakeholders for their views on the potential future use of DLT for wholesale financial transactions, and how these transactions could potentially be settled in central bank money. Should the use of DLTs become more prevalent for wholesale financial transactions, possible Eurosystem responses could include enabling market DLT platforms to interact smoothly with Eurosystem infrastructures based on existing technology, or making central bank money available in a new form that can be recorded and transferred on a DLT platform. These responses are not mutually exclusive.

Following this initial analysis, the Eurosystem has started exploratory practical work. The aim of this work is to gain further insights into how the interaction between existing or new DLT-based infrastructures for settlement in central bank money and market DLT platforms could be facilitated. The exploratory work consists of experiments, in which only mock transactions will be settled in a test environment, and trials, in which a limited number of actual transactions will be settled.

This article discusses the rationale for the Eurosystem exploring central bank money settlement of transactions registered on DLT platforms, the results of its analysis so far and the envisaged next steps. Section 2 provides background on the role of central bank money in the settlement of wholesale financial transactions. Section 3 discusses market developments regarding the use of new technologies, such as DLT, for wholesale financial transactions. Section 4 discusses the implications of a potential market uptake of DLT for the Eurosystem's wholesale central bank money settlement infrastructures. Section 5 outlines the Eurosystem's plans to further explore how wholesale financial transactions recorded on DLT platforms could be settled in central bank money.

2 Central bank money at the heart of the financial system

The importance of central bank money settlement

Financial market infrastructures (FMIs) – that is, payment systems, central securities depositories, securities settlement systems, central counterparties and trade repositories – are the backbone of the financial system. These facilitate financial transactions between the customers of different financial institutions, and between financial institutions themselves. The safe and efficient functioning of systemically important market infrastructures is pertinent for financial stability.

To preserve and strengthen financial stability, international standards prescribe that an FMI should conduct its settlements in central bank money where practical and available. This is laid down in the 12 Principles for financial market infrastructures established by the BIS's Committee on Payment and

Settlement Systems and the International Organization of Securities Commissions.[2] Central bank money refers to central bank liabilities, issued for use as money. Digitally, central bank money is made available to commercial banks in the form of reserves (that is, funds held in accounts at the central bank). Commercial banks in turn issue their own liabilities, namely commercial bank money, to their customers. When the customer of one bank makes a transfer to the customer of another bank, this can be settled via a funds transfer between the banks' accounts at the central bank. Interbank transactions could also be settled in commercial bank money. In this case, credit and liquidity risks may arise, for example if the settlement bank becomes insolvent. The 12 Principles therefore require FMIs that settle in commercial bank money to strictly control and minimise credit and liquidity risks arising from commercial settlement banks. Using central bank money (whenever practicable and available) for settlements within FMIs makes the use of commercial bank money by banks' clients safer by reducing exposures between banks that could ultimately result in losses for their clients. While the clients will pay or receive payment in the commercial bank money of their respective banks, the use of central bank money in payments between their respective banks reinforces and demonstrates the convertibility of commercial bank and central bank money at par. This supports public trust in the currency as the value of a euro is the same, regardless of its issuer.[3]

Using central bank money is particularly relevant for the settlement of wholesale financial transactions, typically carried out between banks and other financial market participants, which stand out because of their high value. The average transaction value in T2, the Eurosystem's large-value payment system, is €5.5 million. While half of the transactions in T2 are below €6,500, at the upper end of the distribution much higher transaction values can be found. For example, in 2022 almost 219 payments with a value of more than €1 billion were made per day, even though these accounted for only 0.05% of payment flows (in terms of number of transactions).[4] Moreover, the structure of the wholesale financial market can lead to a concentration of payment activities and associated exposures within individual banks. Settling wholesale financial transactions in central bank money, rather than in commercial bank money, reduces risks associated with such a concentration.

Wholesale central bank money services or "wholesale central bank digital currency"?

Central bank digital currencies (CBDCs) are a hotly debated topic. In such discussions, a distinction is often made between retail and wholesale CBDCs. The former is relatively well understood, since a digital form of central bank money available to the general public is a new concept, and it can be clearly distinguished

2 See Committee on Payment and Settlement Systems and Technical Committee of the International Organization of Securities Commissions, "Principles for financial market infrastructures", Bank for International Settlements and OICV-IOSCO, April 2012.

3 See Committee on Payment and Settlement Systems, "The role of central bank money in payment systems", Bank for International Settlements, August 2003.

4 See "TARGET Annual Report 2022", ECB, Frankfurt am Main, June 2023.

from other types of money, such as central bank money in physical form (cash) and existing digital forms of money that are either not central bank money or not available to the general public. The concept of wholesale CBDCs lends itself to misunderstandings.

Wholesale CBDC is often presented as a new concept, but central bank money has in fact been available in digital form for wholesale transactions for decades. The Eurosystem enables this through its TARGET Services, which ensure the free flow of cash, securities and collateral across Europe.

The debate is therefore not about whether to provide digital central bank money for wholesale transactions, but about possible technological changes in how this money is provided. For this reason, the Eurosystem has announced that it is exploring new technologies for wholesale central bank money settlement, rather than wholesale CBDC. Therefore, the latter term will not be used in the remainder of this article.[5]

Other central banks around the world are also exploring the potential use of new technologies for wholesale central bank money settlement. A BIS survey[6] of 86 central banks, carried out in late 2022, showed that the majority of these banks were involved in researching wholesale CBDC (to use the terminology of the survey), with many of these also involved in practical experimentation. Some central banks are now taking the next step of testing real transactions with market participants. The Swiss National Bank, for example, recently announced a pilot project involving six commercial banks, in which it will make central bank money available on a regulated third-party platform.[7] Likewise, the Monetary Authority of Singapore announced a pilot project with live transactions between commercial banks, allowing them to issue commercial bank money tokens to their customers and settle associated interbank transactions in central bank money.[8]

Regular improvement of TARGET Services

The role of central bank money as the preferred settlement asset for wholesale financial transactions requires reliable and up-to-date infrastructures. As the following paragraphs recall, the Eurosystem therefore makes continuous efforts to modernise its market infrastructure services, ensuring that they are future-proof and can meet the needs and expectations of market participants.

Over the past two decades, the Eurosystem has made significant progress in integrating and modernising its wholesale settlement infrastructures. Through the transition from the national real-time gross settlement systems to TARGET in

5 See "Eurosystem to explore new technologies for wholesale central bank money settlement", *Press Release*, ECB, 28 April 2023.

6 See Kosse, A. and Mattei, I., "Making headway – Results of the 2022 BIS survey on central bank digital currencies and crypto", *BIS Papers*, No 136, Bank for International Settlements, July 2023.

7 See "SNB launches pilot project with central bank digital currency for financial institutions", *Press Release,* Swiss National Bank, 2 November 2023.

8 See "Shaping the Financial Ecosystem of the Future", Speech by Mr Ravi Menon, Managing Director, Monetary Authority of Singapore, at the Singapore FinTech Festival 2023, 16 November 2023.

1999, and then to TARGET2 in 2007, the Eurosystem created the first pan-European integrated market infrastructure for wholesale payments. This service was complemented by TARGET2-Securities (T2S), in order to harmonise post-trade services for securities transactions. T2S provides a common platform through which securities and cash can be transferred on a DvP basis. In 2018 TARGET Instant Payment Settlement (TIPS) was launched to allow instant retail payments between banks across the EU to be settled in central bank money in real time on a 24/7/365 basis.

Moreover, in December 2017 the Eurosystem began a major project to consolidate the technical and functional aspects of TARGET2 and T2S, resulting in the launch of the new T2 platform in March 2023. This consolidation further harmonises and integrates TARGET Services through a move to the ISO 20022 message standard, a global standard for financial information that is being increasingly adopted by FMIs worldwide, as it facilitates the exchange of richer and more structured data compared with most current proprietary standards.[9] Moreover, the T2 platform contains a set of common components that are shared across TARGET Services, such as a harmonised interface for participants to access the Services. The consolidated platform also offers enhanced cyber resilience and enables participants to steer, manage and monitor liquidity across all TARGET Services. It will be complemented by the Eurosystem Collateral Management System, a unified system for managing assets used as collateral in Eurosystem credit operations.

The Eurosystem is continuing its efforts to develop TARGET Services. The governance arrangements for the TARGET Services, including the change and release management processes, allow the Eurosystem to enhance capacity and resilience where needed, and to respond to business, regulatory and technological developments. Exploring the possible use of, or interactions with, new technologies is part of these continuous efforts to improve the Eurosystem's market infrastructures.

3 Potential use of new technologies such as DLT for settling wholesale financial transactions in central bank money

New technologies: DLT

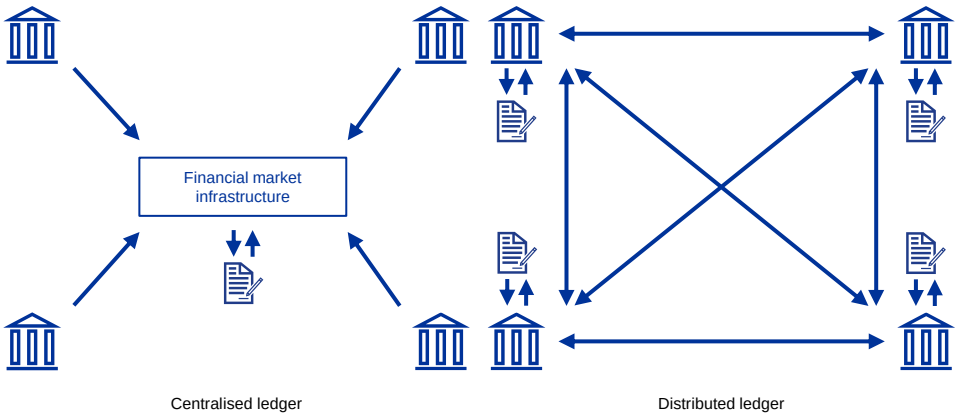
The emergence of DLT could potentially change the market for, and environment of, wholesale financial transactions. A series of private and public initiatives has emerged globally, with the aim of exploring new business opportunities and improving the functioning of market processes through the use of DLT. The potential large-scale adoption of DLT by market participants, for instance for securities transactions, would require the provision of central bank money in a way

9 See Committee on Payments and Market Infrastructures, "Harmonised ISO 20022 data requirements for enhancing cross-border payments", *Report to the G20*, Bank for International Settlements, October 2023.

that is compatible with the new DLT ecosystems, in order to support the settlement of the cash leg of those transactions.

DLT refers to a family of technologies that enable participating entities to validate data and to update a shared ledger, without relying on central coordination. In contrast to existing payments and securities settlement systems, which are generally based on centralised infrastructures where market participants connect to a central database, in DLT networks a database is shared across a network and its data are accessible to the network's members, who can also actively participate in the network's operation. Figure 1 contrasts centralised ledgers (as typically used in existing FMIs) and distributed ledgers.

Figure 1
Differences between centralised and distributed ledgers



Source: Santander InnoVentures, Oliver Wyman and Anthemis, "The Fintech 2.0 Paper: rebooting financial services", 2015.

In a DLT network, any kind of asset (financial or otherwise) can, in principle, be registered in the form of a digital token that could be directly exchanged between participants without the need for a trusted third party to manage accounts. Such a token is a unit of digital information that may represent a real-world asset, such as a security that is registered in a central securities depository. Alternatively, the digital token may be the asset itself, for example a security issued directly as a DLT token.

Many DLT platforms include the possibility to programme "smart contracts". Smart contracts are automatable, "contractual" arrangements embedded in computer software, which the latter can validate, execute and record automatically, as soon as certain predefined conditions have been met, based on information from the distributed ledger itself or a predefined (external) source. The use of such smart contracts could make processes more seamless, depending on the concrete setup of the infrastructure and the smart contracts themselves; for example, frictions could arise due to the need to retrieve information from an external source or to execute transactions across multiple (DLT or non-DLT) platforms that cannot interoperate smoothly.

Market experiences with DLT for wholesale financial transactions

In recent years, a number of market participants in the financial sector have been increasingly exploring the opportunities of DLTs to generate new business models and to improve the functioning of market processes. The Eurosystem has gathered information on relevant market initiatives from market stakeholders and their associations (through surveys and meetings). National central banks of the Eurosystem have provided further information on market and public sector initiatives related to the use of new technologies such as DLT in wholesale payments and securities settlement (including national initiatives, initiatives focusing on the EU or euro area, and global initiatives).

Based on market experiences, two success factors emerge: cooperation between financial institutions in shared projects, and having a clear business case that is built on market needs. Cooperation allows market players to pool their resources and minimise costs or possible losses, while simultaneously avoiding the risk of being left behind in the event of the successful uptake of DLTs. Key to developing a clear business case is the early involvement of potential users to identify use cases that they consider promising – for example, to address existing inefficiencies.

Factors that may contribute to the failure of a DLT project are varied and include both internal and external factors. Internal factors include erroneous design choices (technology readiness, complexity of the project) and suboptimal vendor management. External factors that have been reported by market stakeholders as potential contributors to the failure of a DLT project include the absence of reliable solutions for the settlement of the cash leg of DLT transactions in central bank money, as well as adverse regulatory developments (for instance, April 2022 guidance from the U.S. Securities and Exchange Commission restricts, in practice, the ability of US entities and groups to hold digital assets in custody).[10] Possibly the most important element, however, is the reverse of one of the key success factors: the absence of a clear business case for using DLT. If existing inefficiencies are not technology-based, a change to a different technology may not be the appropriate solution.

Potential benefits and challenges of DLT

Market stakeholders that consider using DLT for wholesale transactions see potential for this technology to improve efficiency by reducing reliance on intermediaries. The main potential benefits explored by market stakeholders relate to the distributed nature of DLT platforms; this enables the shared operation of the relevant platform by its participants, together with the possibility of automating processes through smart contracts. Activities for which participants currently rely on centralised operators could then be conducted by the participants themselves.

10 U.S. Securities and Exchange Commission, "Staff Accounting Bulletin No. 121", 11 April 2022.

On a DLT platform, two-leg transactions (that is, DvP or PvP settlement) could be technically automated without the need to rely on intermediaries. Particularly in a DLT context, this type of technical automation is often referred to as atomic settlement. While DvP and PvP transactions can be conducted with current technology, proponents of DLTs argue that smart contracts can function as a technical solution to ensure that either both or neither of the legs of the transactions are executed, and that both legs are executed as close to simultaneously as possible, without relying on a central validating entity. In addition, the legal finality of DvP/PvP would need to be ensured, as is the case today. Proponents argue that with such atomicity there would be less counterparty risk, fewer delays linked to multiple layers of matching and validation, fewer intermediaries and, therefore, lower costs.

As well as permitting the automation of two-leg transactions, DLT platforms could also allow market participants to define and set conditions for operations in the system, without needing to rely on intermediaries. These could be, for example, conditions for the execution of transactions or the generation of information flows. Like atomic settlement, this feature can be enabled using smart contracts. From a technical perspective, any authorised user of a DLT platform could deploy smart contracts and automate processes directly, if the operator allows it.

The need for reconciliation could be reduced through the use of a shared ledger, which is inherent in DLT. Market stakeholders expect that this feature of DLT could make reconciliation processes (aligning different systems and databases managed separately by each market participant and intermediary) easier, thereby fostering the traceability and auditability of transactions. Some stakeholders also point to the potential for improving the transparency of parties that do not currently have visible transactions in FMIs (including Eurosystem market infrastructures), such as auditors, corporate clients or even the general public (for example, to verify green investments).

In addition, many market stakeholders expect that DLT-based solutions would provide 24/7 instant settlement and the possibility of broader access to FMIs. They have these expectations for both market-operated and central bank-operated systems. These characteristics are, however, less closely linked to the technology itself than the three aspects mentioned above. The ability to operate 24/7 is not DLT-specific. Indeed, the Eurosystem already operates a 24/7 settlement system, TIPS, which is not based on DLT. Similarly, restrictions on access to TARGET Services are not due to technological limitations. Any decision on granting such access to additional parties would be a policy decision, not a technological one, and may be driven primarily by monetary policy implementation and financial stability considerations rather than by market infrastructure considerations.

Market feedback on the future of DLT

The majority of market stakeholders surveyed by the Eurosystem expect a significant uptake of DLT for wholesale payments and securities settlement,

with an indicative time horizon of between five and ten years. Those market stakeholders who expect DLT uptake for wholesale financial transactions generally believe this will take place across the board, in all forms of asset settlements. In their view, DLT settlement could potentially become systemically relevant for securities in general, as part of an overall industry move towards DLTs, in which increasing numbers of assets are registered on a DLT platform.

Those market stakeholders who see potential for DLT for wholesale financial transactions believe that this technology could significantly benefit segments they deem to be characterised by clear inefficiencies and constraints. In their view, international payments (cross-border, cross-currency and correspondent banking payments) could be improved in terms of speed and availability, and the settlement and servicing of illiquid/non-listed instruments could benefit from improved liquidity management and transparency of the registers. Instruments currently not serviced by FMIs (such as over-the-counter traded securities or credit claims) could, in the future, be registered on DLT platforms, thereby possibly making previously non-tradeable assets tradeable.

At the current stage of market explorations, there is considerable uncertainty about the future landscape of DLTs used for wholesale payments and securities settlement. In the longer term, some market stakeholders expect consolidation to only a few major platforms, possibly with an important role for a central bank-run platform. A few expect a fragmented landscape with many (over 50) DLT platforms being used for different types of assets. Most market stakeholders, however, anticipate a landscape between these two extremes, expecting no more than ten DLT platforms to be significant for wholesale financial transactions. In the meantime, market participants will have to make technological choices; while a range of different DLT platforms is available, it is not yet clear which platforms would be most suitable for scalable applications of DLT. Moreover, while sharing a database across a network promotes transparency, the broad adoption of DLT will require the assurance of sufficient privacy for users' data.

The use of multiple DLT platforms, as well as the coexistence of DLT platforms with other infrastructures, may lead to market fragmentation. As noted above, the use of multiple DLT platforms that cannot smoothly interoperate can hamper the seamless processing of transactions. With a view to the overall efficiency of the market, it is therefore important for market stakeholders and the Eurosystem to consider how such an outcome can be averted. As is the case for existing technologies, the ability to agree on industry standards will be important.

Avoiding fragmentation does not necessarily imply a move to a single platform; interoperability and harmonisation can also play an important role. Central banks could bring value through their involvement in harmonising certain aspects of the DLT ecosystem to help bring about interoperability (for example, through regulation and harmonisation of protocols and data taxonomies).

4 Implications of market DLT uptake for Eurosystem TARGET Services and settlement in central bank money

Implications of market DLT uptake

Market stakeholders do not often mention central bank money settlement itself as a service to be improved through the use of DLT. Instead, their interest in new central bank money settlement solutions is driven by their explorations of DLT for other parts of the transaction chain, such as securities settlement.

Should there be a significant industry uptake of DLT for wholesale financial transactions, it would be important to ensure that central bank money can continue to be used to settle the cash leg of such transactions. The Eurosystem has therefore been exploring the suitability of its current services in such a scenario, and whether new solutions might be better able to meet the needs of market participants that are using DLT to register and transfer financial assets. These new solutions may, but need not, involve the provision of central bank money in the form of DLT tokens.

Many market stakeholders state that, in the absence of a DLT-compatible central bank money settlement solution, they would look for alternatives. In such a situation, market stakeholders may consider using alternative settlement assets, such as commercial bank money or stablecoins. Such alternatives would not provide the same level of safety as central bank money. A partial move from central bank money to other settlement assets could also increase liquidity fragmentation and have adverse implications for financial stability.

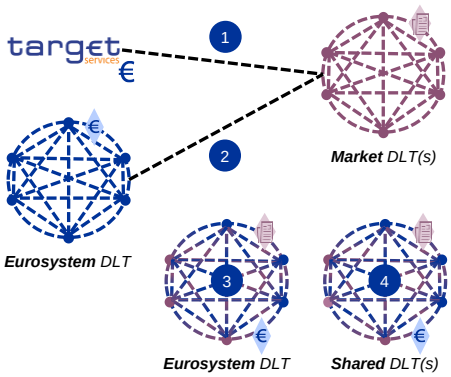
At the same time, some market stakeholders argue that the speed of DLT adoption, if not its success, might to some extent depend on the involvement of the central banking community. The ability to settle transactions in central bank money could be a requirement for certain market participants, preventing them from adopting DLT as long as a suitable central bank money settlement solution is not in place. In addition, central bank involvement could be perceived as support for DLT as an innovation in financial services.

Possible Eurosystem responses

The Eurosystem has analysed possible responses to a potential market DLT uptake for settling wholesale financial transactions and has identified four conceptual solutions. Each of these solutions would enable euro central bank money settlement between banks for transactions where transfers are made using DLT. Figure 2 depicts these four conceptual solutions in a stylised manner. This figure and the paragraphs below describe the example of a securities transaction, but similar solutions could also be used for foreign exchange transactions.

Figure 2

Conceptual solutions for central bank money settlement of wholesale transactions registered on DLT platforms



1) CeBM settlement in TARGET Services based on current technology, interoperable with market DLTs for **securities** settlement ***(Trigger/Bridge)***

2) CeBM settlement on Eurosystem DLT interoperable with market DLTs for **securities** settlement ***(Interoperability)***

3) CeBM and **securities** settlement on Eurosystem DLT ***(Integration)***

4) CeBM and **securities** settlement on DLTs shared between Eurosystem and other stakeholders ***(Distribution)***

Source: ECB.
Notes: Blue lines, dots and icons represent central bank money (CeBM). Purple lines, dots and icons represent securities.

A first option would be to create a technical interface between a DLT platform on the market side and a non-DLT infrastructure (such as the existing TARGET Services) on the Eurosystem side. This technical interface should enable communication between those two infrastructures so that either both or neither of the legs (the securities leg on the market DLT platform and the cash leg in the Eurosystem infrastructure) are settled. Such solutions are referred to as *Trigger/Bridge* solutions.

A second option would be to offer a Eurosystem DLT platform for euro central bank money settlement, combined with a technical interface between that platform and market DLT platforms. This is conceptually very similar to the first option: again, the securities leg would settle on the market DLT platform, and the cash leg in a Eurosystem infrastructure. The key difference is that in this case the Eurosystem infrastructure would be based on DLT. This type of solution is referred to as a full-DLT *Interoperability* solution.

A third option would be to offer a Eurosystem DLT platform where both euro central bank money and securities are settled. This is conceptually similar to the existing T2S platform, but based on DLT. This type of solution is referred to as a full-DLT *Integration* solution.

A fourth option would be to use a platform (or several platforms) jointly operated by the Eurosystem and other parties for the settlement of both euro central bank money and securities. This type of solution is referred to as a full-DLT *Distribution* solution.

Same-platform settlement solutions, such as the Integration and Distribution solutions described above, are similar to the concept of a "unified ledger" proposed by the BIS in its 2023 Annual Economic Report.[11] In a unified ledger,

[11] See Bank for International Settlements, "Blueprint for the future monetary system: improving the old, enabling the new", *BIS Annual Economic Report*, 20 June 2023.

as researched and theoretically described by the BIS, various types of assets (central bank money, commercial bank money and other assets) are represented in the form of programmable tokens to enable seamless automation and integration of complex transactions. This would not, however, imply one global ledger for all assets and use cases. As noted by the BIS, there could be a multiplicity of individual unified ledgers, potentially connected to each other and to existing systems.

The governance of platforms with a wider scope in terms of assets, participants or use cases would presumably be more complex than for platforms with a narrower scope. Issuers and holders of different types of assets will each have their own requirements and may need to play their part in the governance arrangements for the platform. The design of such platforms and their governance would therefore be likely to take more time, and if the requirements of different users and operators of a platform are too divergent, it may not be possible to come to an agreement that suits all of them.

In any solution that may ultimately be implemented, the Eurosystem will need to ensure that both the provision of euro central bank money for settlement and the settlement itself take place under the ultimate control of the Eurosystem. With regard to the current TARGET Services, the Eurosystem is responsible for the overall direction, management and control, including common cost and pricing methodology, security and policies, for example regarding which entities are allowed to hold central bank money for wholesale purposes. The provision of any new Eurosystem solution for the central bank money settlement of DLT-based transactions must not come at the expense of the Eurosystem's control over the central bank money it issues.

The solutions described here are not mutually exclusive. Any solution for the provision of central bank money settlement would be relevant only if and when DLT becomes more widely adopted by market participants. It could be an option to initially offer one solution in response to short-term demand, while another – more complex – solution is launched, potentially offering more advanced functionalities or catering for more use cases. It is also conceivable that different use cases may call for different solutions, in which case multiple solutions may coexist in the long term.

The conceptual solutions described above have already been developed and tested, individually, by some national central banks within the Eurosystem. In the Trigger solution developed by the Deutsche Bundesbank, euro central bank money settlement would take place in the existing TARGET Services, specifically in T2. In the TIPS Hash-Link solution developed by the Banca d'Italia, settlement would take place in an infrastructure based on TIPS, which is currently used for settling instant retail payments (that is, payments between individuals and non-financial institutions). Finally, in the full-DLT solutions developed by the Banque de France, euro central bank money settlement would take place on a DLT platform, operated

by the central bank or jointly with other parties. Further information on these solutions can be found in publications from the respective national central banks.[12]

5 Next steps: Eurosystem exploratory work

In April 2023 the Eurosystem announced that it would embark on a Eurosystem-level exploration of how wholesale financial transactions recorded on DLT platforms could be settled in central bank money. This Eurosystem-coordinated work will build on the previous experiments by individual national central banks and the earlier market outreach and analysis carried out at Eurosystem level.

Together with interested market players, the Eurosystem intends to test three cross-platform settlement solutions.[13] These solutions will be provided by the three national central banks mentioned above. The Eurosystem as a whole will analyse the results of these explorations, using common metrics for all three solutions. Through this coordinated analysis, the Eurosystem aims to gain further insights into the merits of these solutions in terms of their ability to allow users to reap the envisaged benefits of DLTs and to support various wholesale use cases.

The envisaged exploratory work includes experiments, in which only mock transactions will be settled in a test environment, and trials, in which a limited number of real transactions will be settled. These trials could be used, for example, by participants in the EU's DLT Pilot Regime, a temporary regulatory regime for infrastructures for the trading, clearing and settlement of DLT-based financial instruments.[14]

With this initiative, the Eurosystem aims to expand its knowledge and gain consistent and coordinated feedback on the solutions from market players. Some of the previous explorations by individual national central banks also involved market players. However, so far market players have not been able to test all three solutions and compare their merits for the use cases relevant to them. The Eurosystem-coordinated exploratory work will give them the opportunity to do so.

This exploratory work does not prejudge any future decision on the potential implementation of any of the solutions offered in trials and experiments. The Eurosystem will use insights from the exploratory work when developing its vision for

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12 See Deutsche Bundesbank, "Digital money: options for payments", *Monthly Report*, April 2021; Diehl, M. and Drott, C., "Empowering central bank money for a digital future", *SUERF Policy Note*, Issue No 312, June 2023; La Rocca, R., Mancini, R., Benedetti, M., Caruso, M., Cossu, S., Galano, G., Mancini, S., Marcelli, G., Martella, P., Nardelli, M. and Oliviero, C., "Integrating DLTs with market infrastructures: analysis and proof-of-concept for secure DvP between TIPS and DLT platforms", *Research Papers*, No 26, Banca d'Italia Markets, Infrastructures, Payment Systems, July 2022; Banque de France, "Wholesale Central Bank Digital Currency experiments with the Banque de France: Results and key findings", November 2021; and Banque de France, "Wholesale central bank digital currency experiments with the Banque de France: New insights and key takeaways", July 2023.

13 A Call for Expression of Interest to participate in these trials and experiments has been published on the ECB's website.

14 Regulation (EU) 2022/858 of the European Parliament and of the Council of 30 May 2022 on a pilot regime for market infrastructures based on distributed ledger technology, and amending Regulations (EU) No 600/2014 and (EU) No 909/2014 and Directive 2014/65/EU (OJ L 151, 2.6.2022, p. 1).

the future wholesale financial transactions ecosystem. It will also further monitor and assess to what extent market players are indeed adopting DLT to overcome existing inefficiencies or to create new business opportunities. The impact of a potential uptake of DLT on the structure of the market, including the risk of market fragmentation, also requires further analysis. Without pre-empting any future Eurosystem decision on whether to implement a solution using new technology, it is clear that any solution must support market integration.

The ultimate goal of these efforts is to ensure that central bank money remains a monetary anchor that supports the stability, integration and efficiency of the European financial system. The Eurosystem acknowledges the demand for central bank money as the safest settlement asset and thus remains committed to providing settlement in central bank money for wholesale transactions through infrastructures that are fit for purpose. The forthcoming exploratory work will be helpful for determining how (that is, in which way and form) central bank money settlement could be usefully offered in a scenario where DLT is widely adopted by the financial industry.

Statistics

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Further information

Data published by the ECB can be accessed from the ECB Data Portal:	https://data.ecb.europa.eu/
Detailed tables are available in the "Publications" section of the ECB Data Portal:	https://data.ecb.europa.eu/publications
Methodological definitions, general notes and technical notes to statistical tables can be found in the "Methodology" section of the ECB Data Portal:	https://data.ecb.europa.eu/methodology
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	-2.9	-2.2	-10.4	-4.1	2.2	-6.1	1.3	1.7	1.2	0.9	0.0	2.6	0.3
2021	6.5	5.8	8.7	2.6	8.4	5.9	4.0	3.0	4.7	2.6	-0.3	0.9	2.6
2022	3.2	1.9	4.3	1.0	3.0	3.4	9.5	6.7	8.0	9.1	2.5	1.9	8.4
2022 Q4	0.5	0.6	0.1	0.2	0.8	-0.1	10.1	7.5	7.1	10.8	3.8	1.8	10.0
2023 Q1	1.0	0.6	0.3	1.2	2.3	0.1	8.6	7.2	5.8	10.2	3.6	1.3	8.0
Q2	0.6	0.5	0.2	0.9	0.5	0.1	6.5	6.9	4.0	8.4	3.3	0.1	6.2
Q3	0.7	1.3	0.0	-0.7	1.3	-0.1	6.2	6.7	3.5	6.7	3.2	.	5.0
2023 June	-	-	-	-	-	-	5.7	6.6	3.0	7.9	3.3	0.0	5.5
July	-	-	-	-	-	-	5.9	6.7	3.2	6.8	3.3	-0.3	5.3
Aug.	-	-	-	-	-	-	6.4	6.8	3.7	6.7	3.2	0.1	5.2
Sep.	-	-	-	-	-	-	6.2	6.6	3.7	6.7	3.0	0.0	4.3
Oct.	-	-	-	-	-	-	5.6	6.5	3.2	4.6	3.3	-0.2	2.9
Nov. [3]	-	-	-	-	-	-	.	.	3.1	.	.	.	2.4

Sources: Eurostat (col. 6, 13); BIS (col. 9, 10, 11, 12); OECD (col. 1, 2, 3, 4, 5, 7, 8).
1) Quarterly data seasonally adjusted; annual data unadjusted.
2) Data refer to the changing composition of the euro area.
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	47.3	48.8	46.5	42.4	51.4	44.0	48.5	46.1	45.3	-4.1	-4.1	-4.0
2021	54.7	59.6	55.9	49.4	52.0	54.9	53.7	55.0	52.1	11.3	9.9	12.8
2022	50.6	50.7	53.0	50.3	48.2	51.4	49.9	51.0	47.8	2.6	4.3	0.9
2022 Q1	52.2	54.9	58.3	48.7	48.0	54.2	51.0	52.6	49.1	0.8	2.8	-1.3
Q2	51.7	54.0	55.0	52.1	44.9	54.2	50.2	52.1	48.8	-0.2	-0.2	-0.2
Q3	50.0	47.2	50.3	50.2	51.8	49.0	49.9	50.0	47.6	0.6	-0.4	1.7
Q4	48.4	46.5	48.5	50.1	47.9	48.2	48.7	48.3	47.0	-1.8	-1.9	-1.7
2022 July	50.9	47.7	52.1	50.2	54.0	49.9	50.7	50.9	48.6	1.1	0.6	1.8
Aug.	49.2	44.6	49.6	49.4	53.0	49.0	49.8	49.0	47.5	1.0	-0.4	2.5
Sep.	49.8	49.5	49.1	51.0	48.5	48.1	49.1	50.1	46.5	0.6	-0.4	1.7
Oct.	49.2	48.3	48.2	51.8	48.3	47.3	49.5	49.2	47.3	-0.1	-0.8	0.7
Nov.	48.0	46.4	48.2	48.9	47.0	47.8	48.1	47.9	47.0	-1.0	-1.5	-0.4
Dec.	47.9	45.0	49.0	49.7	48.3	49.3	48.6	47.7	46.7	-1.8	-1.9	-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 Economic activity

2.1 GDP and expenditure components

(quarterly data seasonally adjusted; annual data unadjusted)

	GDP											
	Total	Domestic demand								External balance [1]		
		Total	Private consumption	Government consumption	Gross fixed capital formation				Changes in inventories [2]	Total	Exports [1]	Imports [1]
						Total construction	Total machinery	Intellectual property products				
	1	2	3	4	5	6	7	8	9	10	11	12
	Current prices (EUR billions)											
2020	11,517.2	11,106.0	5,951.3	2,579.7	2,534.3	1,236.1	689.6	601.8	40.6	411.2	5,222.9	4,811.7
2021	12,475.1	11,979.7	6,351.9	2,737.4	2,728.4	1,390.3	761.2	570.3	162.0	495.5	6,171.6	5,676.2
2022	13,492.2	13,248.4	7,062.9	2,899.4	3,019.7	1,561.8	847.0	603.7	266.4	243.7	7,436.2	7,192.5
2022 Q4	3,457.9	3,383.8	1,828.1	742.7	774.6	398.3	219.0	155.6	38.3	74.1	1,912.6	1,838.5
2023 Q1	3,526.3	3,391.4	1,853.8	738.7	783.5	405.2	223.5	153.1	15.3	134.9	1,898.2	1,763.3
Q2	3,570.4	3,432.4	1,871.5	751.3	788.2	404.3	226.3	155.6	21.4	138.0	1,863.6	1,725.7
Q3	3,591.7	3,452.8	1,895.1	759.3	795.0	406.7	229.0	157.3	3.4	138.9	1,834.4	1,695.5
	as a percentage of GDP											
2022	100.0	98.2	52.3	21.5	22.4	11.6	6.3	4.5	2.0	1.8	-	-
	Chain-linked volumes (prices for the previous year)											
	quarter-on-quarter percentage changes											
2022 Q4	-0.1	-0.5	-0.8	0.5	-0.4	-0.6	-0.8	0.6	-	-	-0.3	-1.1
2023 Q1	0.1	-0.6	0.0	-0.5	0.4	0.8	2.0	-2.8	-	-	-0.3	-1.6
Q2	0.1	0.8	0.0	0.2	-0.1	-0.8	0.3	1.4	-	-	-1.1	0.0
Q3	-0.1	-0.1	0.3	0.3	0.0	-0.3	0.4	0.4	-	-	-1.1	-1.2
	annual percentage changes											
2020	-6.1	-5.7	-7.7	1.0	-5.9	-3.4	-11.6	-3.9	-	-	-9.1	-8.5
2021	5.9	4.7	4.4	4.2	3.5	5.9	8.0	-6.5	-	-	11.5	9.2
2022	3.4	3.5	4.2	1.6	2.6	1.4	4.9	2.8	-	-	7.2	7.9
2022 Q4	1.8	1.2	1.3	0.7	0.9	-0.2	7.1	-3.9	-	-	4.6	3.3
2023 Q1	1.3	0.6	1.3	-0.2	1.8	-1.0	5.6	3.5	-	-	2.7	1.5
Q2	0.6	0.7	0.6	0.1	1.2	-1.3	4.7	2.5	-	-	-0.4	-0.3
Q3	0.0	-0.5	-0.4	0.5	-0.1	-0.9	1.8	-0.4	-	-	-2.8	-3.8
	contributions to quarter-on-quarter percentage changes in GDP; percentage points											
2022 Q4	-0.1	-0.5	-0.4	0.1	-0.1	-0.1	-0.1	0.0	-0.1	0.4	-	-
2023 Q1	0.1	-0.6	0.0	-0.1	0.1	0.1	0.1	-0.1	-0.6	0.7	-	-
Q2	0.1	0.8	0.0	0.0	0.0	-0.1	0.0	0.1	0.7	-0.6	-	-
Q3	-0.1	-0.1	0.2	0.1	0.0	0.0	0.0	0.0	-0.3	0.0	-	-
	contributions to annual percentage changes in GDP; percentage points											
2020	-6.1	-5.5	-4.1	0.2	-1.3	-0.4	-0.8	-0.2	-0.3	-0.6	-	-
2021	5.9	4.8	2.4	1.0	0.9	0.7	0.5	-0.3	0.6	1.4	-	-
2022	3.4	3.5	2.2	0.4	0.6	0.2	0.3	0.1	0.3	0.0	-	-
2022 Q4	1.8	1.1	0.7	0.1	0.2	0.0	0.4	-0.2	0.1	0.8	-	-
2023 Q1	1.3	0.6	0.7	0.0	0.4	-0.1	0.3	0.2	-0.4	0.7	-	-
Q2	0.6	0.7	0.3	0.0	0.3	-0.1	0.3	0.1	0.1	-0.1	-	-
Q3	0.0	-0.5	-0.2	0.1	0.0	-0.1	0.1	0.0	-0.4	0.5	-	-

Sources: Eurostat and ECB calculations.

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

2) Including acquisitions less disposals of valuables.

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	10,378.7	175.2	2,009.2	549.4	1,807.3	546.9	486.6	1,210.9	1,203.5	2,066.4	323.2	1,138.5
2021	11,192.0	186.6	2,220.3	594.6	2,021.6	598.5	515.1	1,247.2	1,297.7	2,173.0	337.6	1,283.1
2022	12,153.0	213.1	2,456.7	655.3	2,330.2	633.3	523.6	1,304.0	1,396.7	2,269.7	370.4	1,339.2
2022 Q4	3,134.3	55.8	639.2	169.3	600.9	161.8	138.2	335.5	359.8	579.7	94.2	323.5
2023 Q1	3,197.7	56.3	663.7	178.1	604.7	164.0	144.4	344.5	364.2	581.1	96.7	328.6
Q2	3,232.4	54.4	662.9	179.2	610.7	168.5	149.1	349.1	371.0	589.3	98.2	338.0
Q3	3,245.7	55.3	653.4	180.9	612.7	170.0	150.3	352.9	373.3	597.4	99.5	346.0
	as a percentage of value added											
2022	100.0	1.8	20.2	5.4	19.2	5.2	4.3	10.7	11.5	18.7	3.0	-
	Chain-linked volumes (prices for the previous year)											
	quarter-on-quarter percentage changes											
2022 Q4	-0.1	0.1	-0.3	-0.2	-0.7	0.2	0.3	0.2	0.2	0.3	-1.2	0.0
2023 Q1	0.2	1.0	-1.1	1.9	0.2	0.9	-0.4	0.9	0.1	0.3	2.0	-0.7
Q2	0.0	0.1	-0.4	-0.9	0.0	1.4	0.6	-0.2	0.5	0.1	0.6	1.0
Q3	0.0	-0.9	-1.0	-0.1	0.0	1.0	-0.1	0.2	0.1	0.2	1.6	-0.7
	annual percentage changes											
2020	-5.9	-1.8	-6.0	-5.3	-13.9	2.2	-0.5	-0.9	-5.4	-2.9	-18.1	-7.3
2021	5.8	1.1	8.8	2.9	7.9	9.3	5.6	1.9	6.6	3.5	4.3	7.1
2022	3.5	-3.2	1.3	1.1	7.5	5.8	0.2	2.3	4.7	1.9	11.9	2.5
2022 Q4	2.2	-3.2	1.5	-0.6	2.9	4.2	0.4	1.7	3.0	2.1	7.4	-0.9
2023 Q1	1.7	0.2	-0.1	0.7	2.5	5.1	0.2	1.9	1.8	1.7	6.6	-2.5
Q2	0.7	1.0	-1.0	-0.2	0.2	4.7	0.6	1.1	1.4	1.2	3.2	-0.5
Q3	0.1	0.3	-2.8	0.7	-0.4	3.5	0.4	1.1	1.0	0.9	2.9	-0.4
	contributions to quarter-on-quarter percentage changes in value added; percentage points											
2022 Q4	-0.1	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.1	0.0	-
2023 Q1	0.2	0.0	-0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	-
Q2	0.0	0.0	-0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	-
Q3	0.0	0.0	-0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	-
	contributions to annual percentage changes in value added; percentage points											
2020	-5.9	0.0	-1.2	-0.3	-2.6	0.1	0.0	-0.1	-0.6	-0.5	-0.6	-
2021	5.8	0.0	1.8	0.2	1.4	0.5	0.3	0.2	0.8	0.7	0.1	-
2022	3.5	-0.1	0.3	0.1	1.4	0.3	0.0	0.3	0.5	0.4	0.4	-
2022 Q4	2.2	-0.1	0.3	0.0	0.5	0.2	0.0	0.2	0.3	0.4	0.2	-
2023 Q1	1.7	0.0	0.0	0.0	0.5	0.3	0.0	0.2	0.2	0.3	0.2	-
Q2	0.7	0.0	-0.2	0.0	0.0	0.2	0.0	0.1	0.2	0.2	0.1	-
Q3	0.1	0.0	-0.6	0.0	-0.1	0.2	0.0	0.1	0.1	0.2	0.1	-

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										
		Employees	Self-employed	Agriculture, forestry and fishing	Manufacturing, energy and utilities	Construction	Trade, transport, accommodation and food services	Information and communication	Finance and insurance	Real estate	Professional, business and support services	Public administration, education, health and social work	Arts, entertainment and other services
	1	2	3	4	5	6	7	8	9	10	11	12	13
Persons employed													
as a percentage of total persons employed													
2020	100.0	86.0	14.0	3.0	14.6	6.2	24.4	3.0	2.4	1.0	13.8	24.8	6.6
2021	100.0	86.1	13.9	3.0	14.4	6.3	24.1	3.1	2.4	1.0	14.0	25.0	6.6
2022	100.0	86.2	13.8	2.9	14.2	6.4	24.4	3.2	2.3	1.0	14.1	24.8	6.5
annual percentage changes													
2020	-1.4	-1.5	-1.1	-2.5	-1.9	0.7	-3.9	1.9	0.4	0.7	-2.0	1.0	-3.0
2021	1.4	1.6	0.4	0.2	0.0	3.2	0.3	4.5	0.6	0.4	2.9	2.1	0.9
2022	2.3	2.4	1.2	-0.9	1.2	3.1	3.4	5.8	0.0	2.9	3.0	1.6	1.4
2022 Q4	1.5	1.7	0.8	-1.3	1.0	2.1	1.8	4.7	0.5	3.2	2.0	1.3	0.9
2023 Q1	1.6	1.7	1.4	-1.4	1.3	1.5	2.3	4.7	1.2	2.6	2.0	1.2	1.1
Q2	1.4	1.4	1.4	-2.3	1.1	0.7	2.0	3.8	1.2	2.7	2.1	1.1	0.3
Q3	1.3	1.3	1.5	-1.1	0.8	1.1	2.2	2.4	1.3	1.7	1.5	1.2	-0.1
Hours worked													
as a percentage of total hours worked													
2020	100.0	82.0	18.0	4.3	15.1	7.0	24.1	3.3	2.6	1.1	13.7	23.1	5.7
2021	100.0	81.8	18.2	4.1	15.0	7.3	24.3	3.4	2.5	1.1	14.0	22.6	5.8
2022	100.0	81.9	18.1	3.9	14.6	7.3	25.2	3.5	2.4	1.1	14.1	22.0	5.9
annual percentage changes													
2020	-8.0	-7.3	-11.2	-3.5	-7.6	-6.1	-14.7	-1.8	-2.2	-5.4	-8.2	-2.0	-12.7
2021	5.9	5.7	6.7	1.1	5.1	9.8	6.8	7.9	3.0	5.9	8.2	3.9	6.5
2022	3.4	3.5	3.0	-1.5	0.9	3.2	7.5	5.9	-0.1	4.6	4.0	0.6	5.8
2022 Q4	2.1	2.2	1.9	-1.3	1.1	3.0	3.1	5.0	1.2	3.8	2.8	1.0	2.6
2023 Q1	2.0	2.3	0.6	-1.0	1.7	1.4	2.9	4.4	1.3	1.9	2.3	1.3	2.1
Q2	1.5	1.6	1.0	-2.7	1.3	1.1	1.7	3.8	1.5	2.2	2.3	1.5	1.0
Q3	1.3	1.3	1.1	-1.3	0.6	1.4	1.8	1.7	1.2	2.0	1.5	1.3	0.9
Hours worked per person employed													
annual percentage changes													
2020	-6.7	-5.9	-10.2	-0.9	-5.8	-6.7	-11.3	-3.7	-2.6	-6.0	-6.4	-3.1	-10.0
2021	4.4	4.1	6.3	0.9	5.1	6.4	6.4	3.2	2.3	5.4	5.1	1.7	5.6
2022	1.1	1.1	1.7	-0.5	-0.3	0.1	4.0	0.2	-0.1	1.7	1.0	-0.9	4.3
2022 Q4	0.6	0.5	1.1	0.0	0.2	0.9	1.3	0.3	0.7	0.5	0.8	-0.4	1.7
2023 Q1	0.3	0.6	-0.8	0.5	0.4	-0.1	0.6	-0.3	0.1	-0.7	0.3	0.1	1.1
Q2	0.1	0.2	-0.4	-0.3	0.2	0.4	-0.3	0.0	0.3	-0.5	0.2	0.4	0.7
Q3	0.0	0.0	-0.4	-0.3	-0.1	0.3	-0.4	-0.7	-0.1	0.3	0.1	0.2	0.9

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		51.2		48.8		
2020	162.758	3.5	12.964	8.0	3.0	10.381	7.0	2.584	18.2	6.644	7.6	6.320	8.3	1.8
2021	165.051	3.4	12.787	7.8	3.2	10.303	6.9	2.483	16.9	6.517	7.4	6.270	8.1	2.4
2022	167.815	3.1	11.338	6.8	2.7	9.080	6.0	2.259	14.6	5.687	6.4	5.651	7.2	3.1
2022 Q4	168.610	3.0	11.205	6.6	2.5	8.947	5.9	2.258	14.4	5.592	6.2	5.613	7.1	3.1
2023 Q1	169.441	3.0	11.102	6.6	2.5	8.909	5.8	2.193	13.9	5.580	6.2	5.522	7.0	3.1
Q2	169.791	3.0	10.962	6.5	2.3	8.714	5.7	2.248	14.1	5.532	6.1	5.430	6.8	3.0
Q3	.	.	.	6.5	.	.	5.7	.	14.6	.	6.2	.	6.9	2.9
2023 May	-	-	10.995	6.5	-	8.755	5.7	2.240	14.1	5.516	6.1	5.478	6.9	-
June	-	-	10.974	6.5	-	8.733	5.7	2.241	14.1	5.542	6.1	5.432	6.8	-
July	-	-	11.156	6.6	-	8.834	5.7	2.322	14.6	5.632	6.2	5.524	6.9	-
Aug.	-	-	11.042	6.5	-	8.716	5.7	2.326	14.6	5.584	6.2	5.458	6.9	-
Sep.	-	-	11.100	6.5	-	8.748	5.7	2.352	14.7	5.589	6.2	5.512	6.9	-
Oct.	-	-	11.120	6.5	-	8.722	5.7	2.398	14.9	5.583	6.2	5.537	6.9	-

Sources: Eurostat and ECB calculations.

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

2) Not seasonally adjusted.

3) The job vacancy rate is equal to the number of job vacancies divided by the sum of the number of occupied posts and the number of job vacancies, expressed as a percentage. Data are non-seasonally adjusted and cover industry, construction and services (excluding households as employers and extra-territorial organisations and bodies).

2.5 Short-term business statistics

	Industrial production						Con-struction produc-tion	Retail sales				Services production [1]	New passenger car regis-trations
	Total (excluding construction)		Main Industrial Groupings					Total	Food, beverages, tobacco	Non-food	Fuel		
		Manu-facturing	Inter-mediate goods	Capital goods	Consumer goods	Energy							
	1	2	3	4	5	6	7	8	9	10	11	12	13
% of total in 2015	100.0	88.7	32.1	34.5	21.8	11.6	100.0	100.0	40.4	52.5	7.1	100.0	100.0
annual percentage changes													
2020	-7.7	-8.2	-7.2	-11.2	-4.3	-4.4	-5.3	-0.8	3.7	-2.3	-14.4	-9.8	-24.3
2021	8.9	9.8	9.6	11.7	8.1	1.5	6.0	5.1	0.9	7.8	9.6	8.1	-2.9
2022	2.3	3.0	-1.3	5.5	5.4	-3.7	2.4	0.7	-2.8	2.5	6.3	10.0	-4.3
2022 Q1	1.6	2.1	1.0	0.3	6.3	-1.4	6.1	6.0	-1.5	11.5	12.4	12.4	-12.3
Q2	2.0	2.6	-0.3	4.5	3.3	-1.8	2.7	1.1	-2.8	3.2	7.6	13.3	-16.2
Q3	3.4	4.0	-1.7	9.9	3.1	-1.7	0.8	-0.6	-1.6	-0.7	3.1	9.2	1.5
Q4	2.2	3.5	-4.4	7.2	8.9	-9.3	0.3	-2.8	-5.1	-1.9	3.4	6.2	15.3
2023 May	-2.4	-2.0	-5.5	2.7	-3.4	-6.7	0.4	-2.1	-2.8	-1.5	-0.9	4.3	20.3
June	-1.1	-0.4	-6.3	4.9	-0.9	-7.3	-0.5	-0.8	-2.6	0.7	-0.9	3.3	19.0
July	-2.2	-1.9	-5.1	0.7	-1.4	-6.0	1.3	-0.8	-2.1	1.3	-1.6	3.6	16.5
Aug.	-5.3	-5.1	-5.2	-7.0	-2.7	-5.8	0.0	-1.8	-2.4	0.0	-7.3	2.8	23.6
Sep.	-6.8	-6.9	-4.7	-9.4	-5.9	-6.0	-0.3	-2.9	-0.9	-3.4	-6.7	2.5	8.8
Oct.	-6.6	-7.1	-4.1	-9.7	-7.6	-0.5	.	-1.2	-1.5	0.1	-6.4	.	14.1
month-on-month percentage changes (s.a.)													
2023 May	0.1	0.2	0.4	0.7	0.4	-2.2	0.4	0.4	0.2	0.5	0.5	2.6	-0.2
June	-0.1	1.1	-1.0	-0.1	-1.2	0.5	-1.1	0.1	0.1	0.2	-0.4	-0.9	2.2
July	-1.3	-4.2	0.1	-3.1	0.6	1.2	0.8	-0.1	0.2	0.2	-0.5	0.5	3.6
Aug.	0.6	0.2	-0.3	0.4	0.2	-0.2	-1.1	-0.7	-0.5	-0.8	-2.2	0.5	4.6
Sep.	-1.0	-0.6	-0.4	0.3	-1.3	-1.5	0.4	-0.1	1.0	-0.9	0.4	-0.1	0.0
Oct.	-0.7	-0.5	-0.6	-1.4	0.5	1.1	.	0.1	-1.1	0.8	-0.8	.	-2.2

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

1) Excluding trade and financial services.

2 Economic activity

2.6 Opinion surveys
(seasonally adjusted)

	European Commission Business and Consumer Surveys (percentage balances, unless otherwise indicated)								Purchasing Managers' Surveys (diffusion indices)			
	Economic sentiment indicator (long-term average = 100)	Manufacturing industry		Consumer confidence indicator	Construction confidence indicator	Retail trade confidence indicator	Service industries		Purchasing Managers' Index (PMI) for manufacturing	Manufacturing output	Business activity for services	Composite output
		Industrial confidence indicator	Capacity utilisation (%)				Services confidence indicator	Capacity utilisation (%)				
	1	2	3	4	5	6	7	8	9	10	11	12
1999-20	99.7	-4.3	80.7	-10.8	-12.4	-7.0	7.3	-	51.4	52.5	52.7	52.6
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	101.9	4.8	82.0	-21.9	5.2	-3.8	9.3	90.1	52.1	49.3	52.1	51.4
2022 Q4	95.3	-0.9	81.4	-24.3	3.1	-4.7	4.9	90.4	47.1	45.9	49.0	48.2
2023 Q1	99.2	0.0	81.3	-19.6	1.2	-1.0	9.3	90.0	48.2	49.8	52.8	52.0
Q2	96.9	-5.1	80.6	-17.0	-0.8	-4.1	7.5	90.3	44.7	46.4	54.5	52.3
Q3	93.9	-9.3	79.7	-16.3	-4.9	-5.1	4.8	90.4	43.2	43.1	49.2	47.5
2023 June	95.3	-7.1	-	-16.1	-2.6	-6.0	5.8	-	43.4	44.2	52.0	49.9
July	94.6	-9.1	80.0	-15.1	-3.7	-4.5	5.5	90.6	42.7	42.7	50.9	48.6
Aug.	93.7	-9.9	-	-16.0	-5.3	-5.1	4.5	-	43.5	43.4	47.9	46.7
Sep.	93.4	-8.9	-	-17.7	-5.8	-5.7	4.2	-	43.4	43.1	48.7	47.2
Oct.	93.5	-9.2	79.4	-17.8	-5.5	-7.4	4.6	90.1	43.1	43.1	47.8	46.5
Nov.	93.8	-9.5	-	-16.9	-4.8	-7.0	4.9	-	44.2	44.6	48.7	47.6

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]	Housing wealth	Profit rate [3]	Saving rate (gross)	Debt ratio [4]	Financial investment	Non-financial investment (gross)	Financing
	Percentage of gross disposable income (adjusted) [1]		Annual percentage changes					Percentage of gross value added		Percentage of GDP	Annual percentage changes		
	1	2	3	4	5	6	7	8	9	10	11	12	13
2020	19.6	95.5	-0.1	4.2	-1.5	5.5	4.9	45.8	24.6	78.4	3.8	-11.9	2.6
2021	17.5	95.1	2.1	3.8	19.3	8.6	8.8	49.0	27.1	76.0	5.5	9.8	3.4
2022	13.7	92.8	-0.2	2.5	12.2	1.5	7.0	48.9	24.8	71.7	3.0	8.7	1.9
2022 Q3	14.0	94.3	-0.4	2.7	9.8	3.0	9.3	49.2	25.2	73.6	3.9	24.0	2.7
Q4	13.7	92.8	-0.5	2.5	5.3	1.5	7.0	48.9	24.8	71.7	3.0	1.2	1.9
2023 Q1	13.5	90.9	1.0	2.3	5.5	2.8	5.5	48.5	24.9	69.6	2.4	-1.0	1.3
Q2	13.8	89.4	1.2	2.1	2.1	4.5	4.4	48.1	24.6	68.8	1.7	18.4	0.8

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 Q4	1,377.4	1,384.8	-7.4	755.1	756.4	313.0	268.8	266.1	277.0	43.2	82.5	58.8	34.0
2023 Q1	1,390.3	1,352.7	37.6	752.5	697.3	324.0	299.2	273.2	281.1	40.6	75.1	36.0	30.9
Q2	1,394.1	1,332.8	61.3	721.6	668.0	326.9	294.8	301.9	285.0	43.7	85.0	25.2	21.3
Q3	1,382.6	1,299.0	83.7	727.9	636.5	319.6	292.6	293.2	287.1	41.9	82.7	26.8	14.4
2023 Apr.	444.3	435.8	8.5	225.7	216.4	107.3	99.4	97.2	91.5	14.1	28.5	7.1	8.0
May	470.7	455.0	15.7	244.2	229.4	110.2	99.2	100.9	98.6	15.4	27.7	5.8	6.4
June	479.1	442.0	37.0	251.6	222.2	109.3	96.2	103.9	94.9	14.3	28.7	12.2	7.0
July	444.7	423.1	21.6	232.4	208.3	104.0	93.2	94.3	93.5	14.1	28.1	7.9	6.1
Aug.	476.6	445.7	30.8	254.5	218.2	107.9	100.2	100.0	100.0	14.1	27.3	8.5	4.5
Sep.	461.3	430.1	31.2	241.0	209.9	107.7	99.2	98.9	93.7	13.7	27.3	10.3	3.8
12-month cumulated transactions													
2023 Sep.	5,544.4	5,369.3	175.1	2,957.1	2,758.3	1,283.5	1,155.5	1,134.4	1,130.2	169.4	325.3	146.7	100.7
12-month cumulated transactions as a percentage of GDP													
2023 Sep.	39.2	38.0	1.2	20.9	19.5	9.1	8.2	8.0	8.0	1.2	2.3	1.0	0.7

1) The capital account is not seasonally adjusted.

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

(seasonally adjusted, unless otherwise indicated)

	Total (n.s.a.)		Exports (f.o.b.)					Imports (c.i.f.)					
			Total				Memo item:	Total				Memo items:	
	Exports	Imports		Intermediate goods	Capital goods	Consump-tion goods	Manu-facturing		Intermediate goods	Capital goods	Consump-tion goods	Manu-facturing	Oil
	1	2	3	4	5	6	7	8	9	10	11	12	13
Values (EUR billions; annual percentage changes for columns 1 and 2)													
2022 Q4	15.3	20.3	736.0	361.4	139.1	221.7	609.3	799.9	481.9	114.6	170.4	521.1	97.1
2023 Q1	8.5	1.1	721.7	346.3	138.1	224.0	595.8	728.9	429.0	114.4	161.9	503.4	78.6
Q2	-1.9	-13.7	708.0	332.6	143.5	216.4	586.1	706.5	409.9	113.5	164.4	502.9	74.0
Q3	-5.7	-22.3	701.7	.	.	.	582.1	677.9	.	.	.	483.9	.
2023 Apr.	-3.5	-11.8	233.3	110.1	47.2	71.9	193.2	240.8	141.2	37.9	55.3	169.2	25.5
May	-2.4	-13.0	238.2	110.7	49.3	72.6	195.1	237.4	137.3	39.2	55.4	169.7	24.1
June	-0.1	-16.0	236.4	111.8	46.9	71.9	197.8	228.3	131.5	36.4	53.8	164.1	24.4
July	-3.1	-18.2	232.5	109.4	46.2	71.3	194.4	229.0	131.6	37.8	53.7	164.0	26.7
Aug.	-4.4	-24.6	235.2	110.6	48.7	71.8	194.0	224.0	128.7	36.6	52.5	161.0	27.3
Sep.	-9.4	-23.9	234.0	.	.	.	193.7	224.8	.	.	.	159.0	.
Volume indices (2000 = 100; annual percentage changes for columns 1 and 2)													
2022 Q4	1.7	2.9	107.5	104.2	109.1	114.7	107.2	120.5	117.3	120.5	122.4	120.7	144.6
2023 Q1	1.6	-1.4	106.6	102.4	105.6	116.9	106.1	116.9	114.9	120.8	116.1	117.8	143.9
Q2	-2.9	-6.0	105.0	100.0	108.5	113.1	105.4	116.4	114.6	122.1	118.1	119.7	157.3
Q3	.	.	.	.	.	.	.	.	.	.	.	.	.
2023 Mar.	2.5	-6.1	106.5	103.0	107.0	115.4	106.6	113.4	111.4	119.6	114.0	116.0	135.7
Apr.	-6.2	-5.9	103.2	98.8	107.4	112.1	103.4	118.1	116.2	124.4	118.8	121.3	158.8
May	-3.0	-5.5	106.8	100.7	111.3	114.5	107.3	117.9	115.2	126.2	120.4	121.7	151.8
June	0.1	-6.4	105.0	100.5	106.8	112.6	105.5	113.1	112.4	115.6	115.2	116.1	161.2
July	-1.6	-5.7	102.9	99.5	105.1	109.8	103.0	115.4	113.9	120.5	118.2	119.0	168.2
Aug.	-2.3	-11.8	105.0	100.2	110.8	110.7	105.2	112.0	110.6	116.8	116.3	116.4	173.2

Sources: ECB and Eurostat.

1) Differences between ECB's b.o.p. goods (Table 2.8) and Eurostat's trade in goods (Table 2.9) are mainly due to different definitions.

2) Product groups as classified in the Broad Economic Categories.

3 Prices and costs

3.1 Harmonised Index of Consumer Prices [1)]

(annual percentage changes, unless otherwise indicated)

	Total					Total (s.a.; percentage change vis-à-vis previous period) [2)]						Administered prices	
	Index: 2015 = 100	Total		Goods	Services	Total	Processed food	Unprocessed food	Non-energy industrial goods	Energy (n.s.a.)	Services	Total HICP excluding administered prices	Administered prices
			Total excluding food and energy										
	1	2	3	4	5	6	7	8	9	10	11	12	13
% of total in 2023	100.0	100.0	69.8	56.5	43.5	100.0	15.5	4.5	26.3	10.2	43.5	86.8	13.2
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 Q4	120.8	10.0	5.1	14.0	4.3	2.3	3.7	3.0	1.6	4.6	1.5	10.0	9.5
2023 Q1	121.3	8.0	5.5	10.3	4.7	0.8	3.3	2.6	1.6	-6.0	1.2	8.1	7.3
Q2	123.2	6.2	5.5	6.8	5.2	0.6	1.8	0.8	0.6	-4.3	1.3	6.1	6.8
Q3	123.9	5.0	5.1	4.5	5.3	1.0	1.2	1.3	0.7	1.3	1.0	5.0	4.5
2023 June	123.5	5.5	5.5	5.5	5.4	0.3	0.4	0.8	0.2	-0.7	0.4	5.2	7.7
July	123.4	5.3	5.5	4.8	5.6	0.4	0.4	1.0	0.3	-0.2	0.4	5.2	6.3
Aug.	124.0	5.2	5.3	4.9	5.5	0.5	0.4	-0.2	0.3	3.3	0.2	5.3	5.2
Sep.	124.4	4.3	4.5	4.0	4.7	0.3	0.4	0.3	-0.1	1.5	0.3	4.6	2.2
Oct.	124.5	2.9	4.2	1.7	4.6	0.1	0.2	0.4	0.0	-1.1	0.3	3.2	0.6
Nov. [3)]	123.9	2.4	3.6	.	4.0	-0.3	0.1	0.9	-0.1	-2.2	-0.1	.	.

	Goods						Services					
	Food (including alcoholic beverages and tobacco)			Industrial goods			Housing		Transport	Communication	Recreation and personal care	Miscellaneous
	Total	Processed food	Unprocessed food	Total	Non-energy industrial goods	Energy		Rents				
	14	15	16	17	18	19	20	21	22	23	24	25
% of total in 2023	20.0	15.5	4.5	36.5	26.3	10.2	9.5	5.6	7.3	2.2	15.2	9.2
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 Q4	13.5	13.4	13.7	14.2	6.2	33.9	3.0	2.1	5.6	-0.7	7.1	2.8
2023 Q1	14.9	15.4	13.3	7.8	6.7	10.0	3.6	2.5	5.8	0.2	7.2	3.8
Q2	12.5	13.5	9.5	3.7	5.8	-1.8	3.7	2.7	6.1	0.4	7.5	4.1
Q3	9.8	10.3	7.9	1.7	4.6	-4.6	3.7	2.7	5.7	0.0	7.2	4.2
2023 June	11.6	12.4	9.0	2.2	5.5	-5.6	3.7	2.7	7.4	0.0	7.2	4.3
July	10.8	11.3	9.2	1.6	5.0	-6.1	3.7	2.7	7.1	0.0	7.5	4.3
Aug.	9.7	10.3	7.8	2.2	4.7	-3.3	3.7	2.8	6.2	0.0	7.3	4.3
Sep.	8.8	9.4	6.6	1.4	4.1	-4.6	3.7	2.7	3.9	0.0	6.7	4.1
Oct.	7.4	8.4	4.5	-1.4	3.5	-11.2	3.6	2.8	3.9	0.3	6.4	4.1
Nov. [3)]	6.9	7.1	6.4	.	2.9	-11.5	.	.	.	.	.	.

Sources: Eurostat and ECB calculations.

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

2) In May 2016 the ECB started publishing enhanced seasonally adjusted HICP series for the euro area, following a review of the seasonal adjustment approach as described in Box 1, *Economic Bulletin*, Issue 3, ECB, 2016 (https://www.ecb.europa.eu/pub/pdf/ecbu/eb201603.en.pdf).

3) Flash estimate.

3 Prices and costs

3.2 Industry, construction and property prices

(annual percentage changes, unless otherwise indicated)

	Industrial producer prices excluding construction [1]										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	16.6	5.9	27.9			
2020	102.0	-2.6	-1.7	-0.1	-1.6	0.9	0.9	1.1	0.6	-9.7	1.7	5.3	1.6
2021	114.5	12.3	7.4	5.8	10.9	2.5	2.1	3.3	1.8	32.2	5.6	8.1	0.5
2022	153.8	34.3	16.9	14.1	20.3	7.2	12.1	16.4	7.7	85.2	11.5	7.0	0.6
2022 Q4	161.9	27.2	14.5	13.1	15.4	7.6	15.3	19.9	9.3	56.1	11.6	2.9	-2.8
2023 Q1	156.2	10.9	9.0	9.8	8.7	7.2	14.1	17.4	8.5	11.5	10.0	0.4	-4.8
Q2	147.2	-1.4	0.9	3.7	-1.1	5.7	9.4	9.6	6.5	-13.1	7.0	-1.7	-10.0
Q3	145.9	-10.5	-0.3	1.1	-4.4	4.5	6.4	5.5	4.5	-28.9	5.0	.	.
2023 May	146.4	-1.6	0.6	3.4	-1.5	5.7	9.4	9.4	6.4	-13.5	-	-	-
June	145.8	-3.4	-1.1	2.5	-2.8	5.3	8.4	8.1	5.8	-16.5	-	-	-
July	145.0	-7.6	-0.8	1.6	-4.0	4.8	7.4	6.6	5.0	-24.2	-	-	-
Aug.	146.0	-11.5	0.0	1.1	-4.5	4.5	6.4	5.5	4.5	-30.6	-	-	-
Sep.	146.8	-12.4	0.0	0.5	-4.8	4.1	5.4	4.3	3.9	-31.2	-	-	-
Oct.	147.1	-9.4	-1.5	-0.2	-5.3	3.7	4.2	2.8	3.0	-25.0	-	-	-

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

1) Domestic sales only.

2) Input prices for residential buildings.

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

3.3 Commodity prices and GDP deflators

(annual percentage changes, unless otherwise indicated)

	GDP deflators								Oil prices (EUR per barrel)	Non-energy commodity prices (EUR)					
	Total (s.a.; index: 2015 = 100)	Total	Domestic demand				Exports [1]	Imports [1]		Import-weighted [2]			Use-weighted [2]		
			Total	Private 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	-1.3	-2.7	37.0	1.5	3.3	-0.2	-0.9	-0.3	-1.7
2021	109.7	2.2	2.9	2.2	1.8	3.9	5.9	7.9	59.8	29.5	21.4	37.1	29.0	22.0	37.0
2022	114.8	4.6	6.8	6.7	4.3	7.8	12.5	17.6	95.0	18.3	28.8	9.6	19.4	27.7	10.9
2022 Q4	117.4	5.6	6.8	8.6	5.7	7.6	10.0	12.8	86.6	5.4	13.9	-2.1	5.2	12.6	-2.7
2023 Q1	119.6	6.1	5.6	8.0	4.1	6.5	5.4	4.1	75.8	-10.5	-5.8	-14.6	-11.5	-7.7	-15.6
Q2	120.9	6.1	4.0	6.9	4.5	4.6	0.4	-3.6	71.6	-18.0	-16.1	-19.9	-18.4	-16.4	-20.8
Q3	121.8	5.8	3.0	5.8	3.8	3.6	-1.8	-7.0	79.8	-13.7	-14.5	-12.9	-14.8	-15.2	-14.3
2023 June	-	-	-	-	-	-	-	-	69.0	-15.4	-15.6	-15.3	-15.7	-15.6	-15.9
July	-	-	-	-	-	-	-	-	72.5	-13.5	-13.7	-13.2	-15.0	-15.1	-14.8
Aug.	-	-	-	-	-	-	-	-	78.8	-15.7	-15.9	-15.6	-16.5	-16.0	-17.1
Sep.	-	-	-	-	-	-	-	-	88.1	-11.9	-13.9	-9.8	-12.9	-14.4	-11.1
Oct.	-	-	-	-	-	-	-	-	86.2	-12.6	-14.9	-10.2	-13.2	-14.6	-11.3
Nov.	-	-	-	-	-	-	-	-	76.9	-9.5	-10.7	-8.3	-10.4	-11.4	-9.1

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

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

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

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
1999-20	4.4	5.5	-	-2.9	27.9	56.5	56.1	-	50.0
2020	-0.3	2.0	-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 Q4	40.2	51.9	29.0	41.6	78.1	65.8	74.3	63.7	62.0
2023 Q1	23.8	43.6	25.9	27.1	78.4	51.3	69.9	57.8	61.2
Q2	7.4	29.9	18.1	11.8	76.9	41.6	64.3	49.2	58.0
Q3	3.3	22.1	16.2	5.8	73.3	39.1	62.0	45.7	55.5
2023 June	4.3	25.1	16.1	7.8	74.9	39.5	61.3	47.0	56.3
July	3.4	23.0	16.5	5.0	73.5	35.8	61.0	45.0	56.1
Aug.	3.0	22.5	16.7	6.1	72.9	39.7	62.2	46.2	55.6
Sep.	3.3	20.6	15.5	6.4	73.6	41.9	62.7	45.8	54.7
Oct.	3.5	19.8	15.8	7.8	72.5	42.5	62.0	46.4	54.1
Nov.	2.3	17.5	17.6	9.4	68.9	42.7	62.5	47.2	54.5

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: 2020 = 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 2020	100.0	100.0	75.3	24.7	69.0	31.0	
2020	100.0	3.1	3.6	1.5	2.8	3.9	1.8
2021	101.0	1.0	1.1	0.6	0.9	1.2	1.3
2022	105.7	4.6	3.9	6.9	4.9	3.9	2.9
2022 Q4	114.2	5.9	5.3	7.9	5.8	6.0	3.1
2023 Q1	102.6	5.2	4.9	6.2	5.6	4.4	4.4
Q2	113.8	4.5	4.6	4.0	4.5	4.3	4.4
Q3	.	.	.	.	.	.	4.7

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

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	2.4	2.0	5.2	7.9	-0.2	0.8	1.3	3.4	6.2	16.7
2021	110.1	-0.2	1.8	-3.7	5.6	-1.9	1.2	-1.5	5.0	1.1	0.9	-0.1
2022	113.8	3.4	7.4	3.5	6.2	2.1	3.2	2.9	4.7	3.5	3.4	-3.0
2022 Q4	116.5	4.7	7.8	3.1	7.8	4.2	4.0	3.3	4.2	5.1	4.9	-1.3
2023 Q1	118.9	5.9	4.3	7.1	5.5	6.5	4.5	6.0	4.8	7.1	3.7	0.0
Q2	119.6	6.3	2.6	7.4	6.4	7.8	4.7	4.9	5.8	6.9	4.8	3.1
Q3	121.5	6.6	4.0	9.6	5.7	7.8	4.2	5.3	3.8	6.7	4.8	3.2
Compensation per employee												
2020	107.1	-0.3	3.2	-2.3	-1.0	-3.3	0.0	-0.2	-0.2	-0.2	2.1	-1.5
2021	111.6	4.2	2.7	4.7	5.2	5.5	5.8	3.3	6.6	4.7	2.3	3.3
2022	116.6	4.5	5.0	3.6	4.1	6.2	3.3	3.0	4.2	5.2	3.8	7.0
2022 Q4	119.1	5.0	5.8	3.5	4.9	5.4	3.5	3.1	2.6	6.1	5.7	5.1
2023 Q1	121.1	5.5	6.0	5.6	4.6	6.7	4.9	5.0	4.0	6.9	4.2	5.5
Q2	121.8	5.5	6.1	5.2	5.5	6.0	5.5	4.3	4.2	6.2	4.9	6.0
Q3	123.3	5.2	5.4	5.8	5.3	5.1	5.3	4.3	3.1	6.2	4.4	6.3
Labour productivity per person employed												
2020	97.1	-4.7	0.8	-4.2	-5.9	-10.4	0.2	-0.9	-1.5	-3.5	-3.9	-15.6
2021	101.4	4.4	0.9	8.8	-0.3	7.5	4.6	4.9	1.5	3.6	1.3	3.4
2022	102.5	1.1	-2.3	0.1	-2.0	4.0	0.1	0.2	-0.5	1.7	0.3	10.3
2022 Q4	102.3	0.3	-1.9	0.5	-2.6	1.1	-0.4	-0.1	-1.5	1.0	0.7	6.5
2023 Q1	101.8	-0.4	1.7	-1.4	-0.8	0.2	0.4	-1.0	-0.7	-0.2	0.5	5.5
Q2	101.8	-0.8	3.4	-2.1	-0.8	-1.7	0.8	-0.6	-1.5	-0.6	0.1	2.9
Q3	101.5	-1.2	1.4	-3.5	-0.4	-2.5	1.1	-0.9	-0.6	-0.5	-0.3	3.0
Compensation per hour worked												
2020	114.0	5.9	5.9	3.3	5.1	7.6	3.1	1.8	4.9	5.9	4.9	7.1
2021	114.1	0.1	0.5	-0.1	-0.5	-0.6	2.7	1.2	2.2	0.1	0.8	-1.5
2022	118.0	3.4	6.3	4.0	4.4	1.9	3.2	3.1	2.9	3.9	4.8	3.4
2022 Q4	120.7	4.5	7.4	3.3	4.3	3.9	3.5	2.6	1.9	5.2	6.1	3.8
2023 Q1	122.0	4.9	4.7	5.2	4.4	5.5	5.1	4.9	4.4	6.2	4.0	4.5
Q2	122.6	5.2	6.5	4.9	5.1	6.2	5.4	4.2	4.8	5.9	4.4	4.9
Q3	124.5	5.2	5.1	5.7	5.2	5.4	5.5	4.6	4.3	6.1	4.3	4.9
Hourly labour productivity												
2020	104.7	2.1	1.7	1.6	0.8	1.0	4.1	1.7	4.8	3.1	-0.9	-6.2
2021	104.7	0.0	0.0	3.5	-6.3	1.0	1.3	2.5	-3.7	-1.5	-0.4	-2.1
2022	104.7	0.0	-1.7	0.4	-2.1	0.0	-0.1	0.3	-2.3	0.7	1.3	5.8
2022 Q4	104.6	-0.3	-1.9	0.3	-3.5	-0.2	-0.7	-0.9	-2.0	0.1	1.1	4.7
2023 Q1	103.8	-0.7	1.2	-1.7	-0.7	-0.3	0.7	-1.1	0.0	-0.5	0.4	4.4
Q2	103.7	-0.9	3.8	-2.3	-1.2	-1.5	0.8	-0.9	-1.1	-0.9	-0.3	2.1
Q3	103.6	-1.2	1.7	-3.4	-0.6	-2.2	1.8	-0.8	-0.9	-0.6	-0.5	2.0

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)	1-month deposits (EURIBOR)	3-month deposits (EURIBOR)	6-month deposits (EURIBOR)	12-month deposits (EURIBOR)	Secured overnight financing rate (SOFR)	Tokyo overnight average rate (TONAR)
	1	2	3	4	5	6	7
2020	-0.55	-0.50	-0.43	-0.37	-0.31	0.36	-0.04
2021	-0.57	-0.56	-0.55	-0.52	-0.49	0.04	-0.02
2022	-0.01	0.09	0.35	0.68	1.10	1.63	-0.03
2023 May	3.08	3.15	3.37	3.68	3.86	5.02	-0.05
June	3.24	3.34	3.54	3.83	4.01	5.06	-0.07
July	3.40	3.47	3.67	3.94	4.15	5.10	-0.05
Aug.	3.64	3.63	3.78	3.94	4.07	5.30	-0.06
Sep.	3.75	3.76	3.88	4.03	4.15	5.31	-0.05
Oct.	3.90	3.86	3.97	4.11	4.16	5.31	-0.02
Nov.	3.90	3.84	3.97	4.06	4.02	5.32	-0.02

Source: Refinitiv and ECB calculations.

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

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
2023 May	3.07	3.02	2.64	2.29	2.38	-0.63	-1.55	-0.53	2.65	2.02	2.23	2.65
June	3.39	3.45	3.12	2.58	2.51	-0.94	-1.59	-0.96	3.21	2.45	2.25	2.56
July	3.48	3.42	3.02	2.53	2.54	-0.87	-1.43	-0.86	3.04	2.31	2.33	2.70
Aug.	3.46	3.38	2.95	2.52	2.57	-0.81	-1.30	-0.80	2.96	2.24	2.39	2.77
Sep.	3.70	3.51	3.16	2.78	2.88	-0.64	-0.89	-0.63	3.14	2.56	2.69	3.17
Oct.	3.82	3.39	2.99	2.68	2.82	-0.56	-0.53	-0.48	2.87	2.41	2.67	3.19
Nov.	3.78	3.26	2.81	2.41	2.53	-0.74	-0.83	-0.72	2.67	2.14	2.33	2.88

Source: ECB calculations.

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

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
2023 May	456.4	4,319.3	975.3	301.8	180.5	116.0	178.9	824.6	858.8	379.9	296.5	835.4	4,146.2	30,147.5
June	455.5	4,324.4	952.1	302.2	170.0	112.7	179.3	835.9	904.5	376.5	277.4	806.2	4,345.4	32,754.5
July	460.1	4,364.5	964.7	305.9	172.9	111.0	185.8	838.3	899.6	375.8	277.8	814.8	4,508.1	32,694.1
Aug.	453.9	4,296.8	966.3	297.6	167.8	115.8	188.6	816.5	867.9	362.6	269.1	828.5	4,457.4	32,167.4
Sep.	447.3	4,227.2	963.8	286.2	161.2	123.9	189.5	787.3	835.7	363.4	280.6	825.2	4,409.1	32,725.6
Oct.	430.8	4,104.0	922.9	274.1	155.6	123.1	186.7	748.8	810.5	344.5	269.0	775.7	4,269.4	31,381.0
Nov.	448.0	4,275.0	963.3	282.6	162.0	123.3	192.5	790.5	885.3	368.0	279.3	742.2	4,460.1	32,960.3

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					
	Overnight	Redeemable at notice of up to 3 months	With an agreed maturity of:				By initial period of rate fixation		APRC [3)]		By initial period of rate fixation				APRC [3)]	Composite cost-of-borrowing indicator
			Up to 2 years	Over 2 years			Floating rate and up to 1 year	Over 1 year			Floating rate and up to 1 year	Over 1 and up to 5 years	Over 5 and up to 10 years	Over 10 years		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2022 Nov.	0.04	0.75	1.21	1.81	5.79	15.97	6.27	6.55	7.11	3.96	2.95	3.04	3.30	2.55	3.11	2.89
Dec.	0.07	0.80	1.42	1.91	5.92	15.90	6.51	6.42	6.98	3.99	3.08	3.16	3.29	2.61	3.18	2.95
2023 Jan.	0.09	0.86	1.60	2.08	6.32	15.99	7.20	6.97	7.58	4.28	3.47	3.32	3.39	2.77	3.39	3.10
Feb.	0.11	1.17	1.91	2.20	6.54	16.08	7.21	7.08	7.78	4.58	3.67	3.48	3.52	2.94	3.55	3.24
Mar.	0.14	1.20	2.11	2.26	6.71	16.07	7.63	7.23	7.90	4.70	3.88	3.78	3.56	3.14	3.72	3.37
Apr.	0.17	1.25	2.28	2.42	6.97	16.23	8.06	7.43	8.11	4.91	4.13	3.85	3.61	3.19	3.81	3.48
May	0.21	1.30	2.47	2.48	7.14	16.34	8.16	7.60	8.31	5.08	4.24	3.98	3.65	3.31	3.93	3.58
June	0.23	1.37	2.71	2.59	7.27	16.27	7.02	7.49	7.99	5.12	4.40	4.07	3.71	3.41	4.05	3.70
July	0.27	1.42	2.82	2.86	7.49	16.40	8.38	7.73	8.41	5.23	4.55	4.14	3.72	3.45	4.09	3.76
Aug.	0.31	1.50	3.04	3.10	7.59	16.47	8.72	7.83	8.49	5.36	4.69	4.21	3.79	3.51	4.16	3.85
Sep.	0.33	1.54	3.08	3.12	7.76	16.54	8.47	7.83	8.56	5.40	4.72	4.24	3.86	3.57	4.24	3.89
Oct. [(p)]	0.35	1.59	3.27	3.31	7.90	16.54	8.25	7.87	8.54	5.58	4.81	4.28	3.78	3.60	4.27	3.91

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 Nov.	0.15	1.49	2.34	2.90	3.34	3.76	4.01	3.12	3.37	3.06	2.89	3.30	3.29	3.11
Dec.	0.19	1.80	2.61	3.20	3.74	3.99	4.19	3.47	3.56	3.28	3.29	3.59	3.29	3.41
2023 Jan.	0.23	1.99	2.72	3.57	4.13	4.20	4.39	3.77	3.92	3.45	3.41	3.75	3.39	3.63
Feb.	0.31	2.30	2.81	3.81	4.40	4.54	4.71	4.06	4.09	3.70	3.69	3.54	3.58	3.86
Mar.	0.41	2.57	2.95	4.11	4.70	4.83	4.88	4.33	4.48	3.84	4.08	4.32	3.88	4.22
Apr.	0.44	2.80	3.11	4.39	4.87	4.74	4.96	4.60	4.58	3.98	4.32	4.37	3.69	4.39
May	0.49	2.96	3.13	4.56	5.04	5.07	5.16	4.76	4.84	4.01	4.47	4.58	4.01	4.57
June	0.55	3.20	3.10	4.78	5.24	5.43	5.26	4.95	4.99	4.14	4.71	4.88	4.11	4.78
July	0.60	3.31	3.58	4.88	5.52	5.52	5.43	5.13	5.02	4.30	4.86	5.01	4.32	4.94
Aug.	0.65	3.42	3.53	5.02	5.46	5.65	5.55	5.24	5.16	4.38	5.00	4.89	4.01	4.99
Sep.	0.75	3.59	3.79	5.19	5.58	5.72	5.64	5.40	5.22	4.40	5.04	4.99	4.20	5.09
Oct. [(p)]	0.80	3.70	3.81	5.31	5.66	5.87	5.73	5.49	5.28	4.52	5.22	5.08	4.54	5.26

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 corporations other than MFIs	FVCs	Non-financial corporations		of which central government			Financial corporations other than MFIs	FVCs	Non-financial corporations		of which central government
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Short-term														
2020	1,489.4	430.3	126.3	51.6	96.7	836.1	722.5	.	.	.	.	.	.	.
2021	1,406.7	427.2	126.9	50.1	87.9	764.7	674.9	387.1	138.3	79.1	26.3	32.1	137.6	104.8
2022	1,372.3	467.6	143.1	51.9	94.7	667.0	621.7	481.7	182.5	117.2	48.2	48.1	133.9	97.1
2023 June	1,486.2	584.5	135.1	50.4	93.7	672.9	634.3	518.1	223.5	116.5	37.0	45.7	132.4	107.1
July	1,489.0	580.9	138.2	51.3	99.2	670.7	634.6	509.5	187.0	119.0	36.5	56.6	146.9	122.5
Aug.	1,514.6	593.6	141.8	51.5	98.9	680.4	647.9	518.7	230.4	121.8	40.2	40.5	126.0	108.3
Sep.	1,530.3	592.1	136.0	50.3	91.8	710.4	676.2	519.8	213.7	115.7	42.2	46.8	143.6	126.5
Oct.	1,517.2	578.7	135.5	47.8	94.8	708.2	671.7	486.6	199.0	115.0	36.3	51.0	121.6	92.2
Nov.	1,518.8	597.1	128.4	44.4	90.9	702.4	667.4	467.5	191.6	114.3	38.1	40.8	120.9	100.3
Long-term														
2020	19,284.3	4,076.4	3,096.8	1,254.1	1,545.4	10,565.6	9,778.7	.	.	.	.	.	.	.
2021	19,923.4	4,182.2	3,377.3	1,340.4	1,599.7	10,764.2	9,943.2	316.2	67.9	83.3	33.6	23.1	141.9	128.4
2022	17,895.4	3,972.7	3,253.3	1,338.6	1,396.7	9,272.7	8,560.9	298.8	78.5	73.0	29.1	16.6	130.6	121.2
2023 June	18,690.0	4,203.2	3,353.2	1,381.1	1,428.6	9,705.0	8,984.9	400.4	114.2	82.5	31.1	31.2	172.5	160.8
July	18,779.8	4,299.8	3,359.5	1,373.0	1,433.5	9,687.1	8,967.0	347.4	140.9	55.7	15.8	18.8	132.0	127.2
Aug.	18,807.3	4,315.0	3,349.4	1,355.9	1,429.5	9,713.3	8,990.8	206.3	52.5	47.9	12.0	8.4	97.4	93.9
Sep.	18,666.1	4,304.1	3,385.6	1,361.5	1,431.8	9,544.6	8,831.0	353.7	92.6	93.8	21.3	29.3	137.9	128.1
Oct.	18,700.6	4,348.3	3,382.1	1,357.8	1,433.3	9,536.8	8,824.6	338.2	94.3	72.1	19.7	14.9	156.8	150.6
Nov.	19,083.2	4,421.5	3,407.2	1,337.3	1,468.0	9,786.4	9,065.1	300.2	87.1	81.0	17.5	27.0	105.1	100.1

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	20,773.7	4,506.7	3,223.1	1,305.7	1,642.1	11,401.8	10,501.2	8,521.7	473.8	1,339.2	6,707.7
2021	21,330.1	4,609.3	3,504.2	1,390.5	1,687.6	11,528.9	10,618.1	10,412.4	600.0	1,555.8	8,255.6
2022	19,267.8	4,440.3	3,396.4	1,390.5	1,491.3	9,939.7	9,182.6	8,744.5	524.9	1,356.6	6,862.3
2023 June	20,176.2	4,787.7	3,488.3	1,431.5	1,522.3	10,377.9	9,619.2	9,672.3	587.2	1,478.2	7,606.3
July	20,268.8	4,880.7	3,497.7	1,424.4	1,532.7	10,357.8	9,601.5	9,823.8	619.1	1,524.4	7,679.7
Aug.	20,321.9	4,908.6	3,491.2	1,407.4	1,528.4	10,393.7	9,638.7	9,553.7	582.2	1,496.3	7,474.7
Sep.	20,196.4	4,896.2	3,521.6	1,411.8	1,523.6	10,255.0	9,507.2	9,190.6	576.1	1,430.2	7,183.9
Oct.	20,217.7	4,927.0	3,517.6	1,405.6	1,528.1	10,245.0	9,496.2	8,871.6	562.5	1,431.3	6,877.3
Nov.	20,602.0	5,018.6	3,535.6	1,381.7	1,559.0	10,488.8	9,732.4	9,425.7	611.2	1,468.1	7,346.0
Growth rate [1]											
2023 Apr.	4.5	8.4	2.6	-1.2	0.7	4.1	4.8	0.0	-2.2	0.5	0.1
May	4.6	9.2	3.5	2.1	0.6	3.6	4.5	-0.2	-2.6	0.5	-0.1
June	5.4	10.4	4.4	3.3	0.9	4.3	5.1	-0.9	-2.4	1.7	-1.3
July	6.1	12.3	4.2	2.0	1.8	4.7	5.3	-1.0	-2.1	0.9	-1.2
Aug.	6.0	12.3	4.1	1.8	1.1	4.6	5.3	-1.0	-2.0	1.0	-1.2
Sep.	6.5	11.3	5.1	3.7	1.6	5.5	6.2	-0.9	-3.1	0.9	-1.0
Oct.	6.1	10.8	5.1	3.2	2.1	5.0	5.5	-1.3	-3.0	0.7	-1.5
Nov.	5.6	10.4	4.2	0.0	2.0	4.4	4.9	-1.2	-4.0	0.8	-1.4

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	93.7	93.8	90.1	74.5	88.5	119.2	93.9
2021	99.6	93.7	93.5	89.4	68.4	86.6	120.5	94.3
2022	95.3	90.8	93.4	84.4	63.8	81.8	116.1	90.9
2022 Q4	95.7	92.1	95.0	85.1	63.0	82.5	116.7	91.9
2023 Q1	97.1	93.0	96.8	86.9	65.8	84.5	119.4	93.3
Q2	98.2	93.8	98.0	88.1	65.0	84.9	121.4	94.6
Q3	98.9	94.9	98.8	.	.	.	123.5	95.9
2023 June	98.2	93.8	98.1	-	-	-	121.8	94.7
July	99.2	95.0	98.9	-	-	-	123.7	96.2
Aug.	99.0	95.1	98.8	-	-	-	123.7	96.1
Sep.	98.5	94.7	98.5	-	-	-	123.0	95.5
Oct.	98.0	94.2	98.5	-	-	-	122.5	95.0
Nov.	98.7	94.4	99.4	-	-	-	123.4	95.2
Percentage change versus previous month								
2023 Nov.	0.7	0.3	0.9	-	-	-	0.7	0.2
Percentage change versus previous year								
2023 Nov.	3.1	2.3	4.6	-	-	-	5.8	3.5

Source: ECB.

1) For a definition of the trading partner groups and other information see the "Methodology" section of the ECB Data Portal.

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 Q4	7.258	24.389	7.438	410.825	144.238	4.727	0.870	4.9208	10.938	0.983	1.021
2023 Q1	7.342	23.785	7.443	388.712	141.981	4.708	0.883	4.9202	11.203	0.992	1.073
Q2	7.644	23.585	7.450	372.604	149.723	4.537	0.869	4.9488	11.469	0.978	1.089
Q3	7.886	24.126	7.453	383.551	157.254	4.499	0.860	4.9490	11.764	0.962	1.088
2023 June	7.765	23.695	7.449	370.602	153.149	4.461	0.859	4.9600	11.677	0.976	1.084
July	7.948	23.892	7.451	379.035	155.937	4.443	0.859	4.9411	11.634	0.966	1.106
Aug.	7.910	24.108	7.452	385.047	157.962	4.460	0.859	4.9411	11.812	0.959	1.091
Sep.	7.797	24.380	7.457	386.429	157.795	4.598	0.862	4.9656	11.842	0.960	1.068
Oct.	7.720	24.584	7.460	385.333	158.038	4.512	0.868	4.9682	11.647	0.955	1.056
Nov.	7.809	24.485	7.458	379.195	161.844	4.402	0.870	4.9703	11.547	0.963	1.081
Percentage change versus previous month											
2023 Nov.	1.1	-0.4	0.0	-1.6	2.4	-2.4	0.3	0.0	-0.9	0.9	2.3
Percentage change versus previous year											
2023 Nov.	6.7	0.5	0.3	-6.8	11.5	-6.3	0.2	1.1	6.1	-2.1	5.9

Source: ECB.

4 Financial market developments

4.10 Euro area balance of payments, financial account

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

	Total [1]			Direct investment		Portfolio investment		Net financial derivatives	Other investment		Reserve assets	Memo: Gross external debt
	Assets	Liabilities	Net	Assets	Liabilities	Assets	Liabilities		Assets	Liabilities		
	1	2	3	4	5	6	7	8	9	10	11	12
Outstanding amounts (international investment position)												
2022 Q3	32,465.6	31,763.8	701.8	12,872.8	10,594.4	11,264.6	12,769.9	-6.2	7,198.8	8,399.6	1,135.7	16,707.6
Q4	31,081.7	30,739.0	342.7	12,254.8	10,097.5	11,099.6	12,826.2	18.4	6,594.6	7,815.3	1,114.3	15,753.9
2023 Q1	31,574.0	31,465.0	109.0	12,250.4	10,030.2	11,332.9	13,397.1	-9.7	6,866.9	8,037.7	1,133.6	16,080.5
Q2	31,743.6	31,561.2	182.4	12,156.5	9,895.5	11,712.9	13,712.2	-35.7	6,804.2	7,953.6	1,105.7	16,059.1
Outstanding amounts as a percentage of GDP												
2023 Q2	227.4	226.1	1.3	87.1	70.9	83.9	98.2	-0.3	48.7	57.0	7.9	115.1
Transactions												
2022 Q4	-514.6	-569.8	55.2	-249.8	-282.3	100.9	88.8	0.2	-375.2	-376.3	9.3	-
2023 Q1	404.4	369.2	35.2	50.0	15.3	63.5	161.0	15.6	293.7	193.0	-18.4	-
Q2	26.5	-45.9	72.4	-98.1	-117.7	205.7	135.0	-5.1	-77.8	-63.2	1.9	-
Q3	77.1	-10.7	87.8	-14.3	0.1	50.5	77.0	11.9	31.3	-87.7	-2.2	-
2023 Apr.	13.8	5.9	7.9	-36.5	-32.2	68.3	1.3	-1.5	-14.6	36.8	-1.9	-
May	-10.9	-1.4	-9.5	-54.2	3.6	38.0	-12.1	7.4	-3.3	7.1	1.4	-
June	23.5	-50.4	73.9	-7.4	-89.1	99.4	145.8	-11.0	-59.9	-107.1	2.4	-
July	126.2	119.0	7.2	-10.1	18.8	40.4	27.4	-0.8	96.4	72.8	0.4	-
Aug.	96.2	54.9	41.3	7.4	-0.2	23.7	25.5	8.9	54.9	29.6	1.3	-
Sep.	-145.3	-184.7	39.4	-11.6	-18.6	-13.6	24.1	3.8	-120.0	-190.2	-3.9	-
12-month cumulated transactions												
2023 Sep.	-6.5	-257.2	250.7	-312.2	-384.7	420.7	461.8	22.5	-128.1	-334.2	-9.5	-
12-month cumulated transactions as a percentage of GDP												
2023 Sep.	0.0	-1.8	1.8	-2.2	-2.7	3.0	3.3	0.2	-0.9	-2.4	-0.1	-

Source: ECB.

1) Net financial derivatives are included in total assets.

5 Financing conditions and credit developments

5.1 Monetary aggregates [1)]

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

	M3											
	M2							M3-M2				
	M1			M2-M1								
	Currency in circulation	Overnight deposits		Deposits with an agreed maturity of up to 2 years	Deposits redeemable at notice of up to 3 months			Repos	Money market fund shares	Debt securities with a maturity of up to 2 years		
	1	2	3	4	5	6	7	8	9	10	11	12
Outstanding amounts												
2020	1,364.0	8,905.5	10,269.5	1,028.8	2,448.9	3,477.7	13,747.1	102.2	624.5	9.4	736.1	14,483.2
2021	1,470.4	9,825.2	11,295.6	918.8	2,504.9	3,423.7	14,719.3	118.7	644.1	25.3	788.1	15,507.4
2022	1,539.5	9,763.4	11,302.9	1,382.1	2,563.9	3,946.0	15,248.9	124.2	646.1	49.5	819.8	16,068.7
2022 Q4	1,539.5	9,763.4	11,302.9	1,382.1	2,563.9	3,946.0	15,248.9	124.2	646.1	49.5	819.8	16,068.7
2023 Q1	1,542.2	9,456.4	10,998.5	1,633.7	2,548.0	4,181.7	15,180.2	102.6	676.7	91.5	870.7	16,050.9
Q2	1,535.3	9,178.0	10,713.3	1,865.1	2,518.0	4,383.1	15,096.3	114.4	695.9	83.8	894.2	15,990.6
Q3	1,535.5	8,985.4	10,521.0	2,085.9	2,465.8	4,551.6	15,072.6	131.0	714.4	76.0	921.4	15,994.0
2023 May	1,537.0	9,274.6	10,811.6	1,770.9	2,529.1	4,300.1	15,111.6	112.4	690.1	91.3	893.8	16,005.5
June	1,535.3	9,178.0	10,713.3	1,865.1	2,518.0	4,383.1	15,096.3	114.4	695.9	83.8	894.2	15,990.6
July	1,534.5	9,084.0	10,618.5	1,922.2	2,506.8	4,428.9	15,047.4	121.8	694.6	77.8	894.2	15,941.6
Aug.	1,534.0	9,008.9	10,542.9	1,993.8	2,485.1	4,478.9	15,021.9	122.0	699.5	84.3	905.8	15,927.7
Sep.	1,535.5	8,985.4	10,521.0	2,085.9	2,465.8	4,551.6	15,072.6	131.0	714.4	76.0	921.4	15,994.0
Oct. [p)]	1,536.0	8,867.8	10,403.8	2,169.0	2,453.2	4,622.2	15,026.0	144.3	711.3	90.4	946.0	15,972.1
Transactions												
2020	139.5	1,266.9	1,406.4	-33.3	85.9	52.6	1,459.0	19.8	110.1	2.2	132.0	1,591.1
2021	107.7	910.7	1,018.4	-121.0	65.7	-55.3	963.1	12.3	20.3	13.2	45.8	1,008.9
2022	69.2	-45.8	23.4	428.9	55.5	484.3	507.7	3.9	2.4	76.6	82.8	590.5
2022 Q4	1.9	-331.4	-329.5	205.9	10.1	216.0	-113.6	6.2	43.0	0.7	50.0	-63.6
2023 Q1	1.3	-346.4	-345.1	245.9	-10.8	235.1	-110.0	-22.1	30.4	43.7	52.1	-57.9
Q2	-6.9	-276.7	-283.6	226.7	-30.1	196.6	-87.0	11.9	19.2	-5.3	25.8	-61.3
Q3	0.2	-201.9	-201.8	224.0	-52.3	171.8	-30.0	16.0	18.2	-8.7	25.6	-4.4
2023 May	-0.1	-98.1	-98.1	74.3	-9.7	64.7	-33.4	8.9	13.4	5.0	27.3	-6.1
June	-1.7	-92.1	-93.8	94.3	-11.1	83.2	-10.6	2.4	5.8	-5.1	3.1	-7.5
July	-0.9	-91.0	-91.9	58.6	-11.1	47.5	-44.4	7.7	-1.4	-5.0	1.3	-43.2
Aug.	-0.4	-82.4	-82.9	75.9	-21.7	54.2	-28.7	-0.1	4.8	4.8	9.4	-19.2
Sep.	1.5	-28.5	-27.0	89.5	-19.4	70.1	43.1	8.5	14.8	-8.4	14.9	58.0
Oct. [p)]	0.5	-115.4	-114.9	83.7	-12.4	71.3	-43.7	13.4	-3.2	13.6	23.8	-19.9
Growth rates												
2020	11.4	16.4	15.8	-3.1	3.6	1.5	11.8	24.5	21.2	-	21.7	12.3
2021	7.9	10.2	9.9	-11.7	2.7	-1.6	7.0	12.1	3.3	158.5	6.2	7.0
2022	4.7	-0.5	0.2	45.7	2.2	14.1	3.4	3.1	0.4	457.8	11.1	3.8
2022 Q4	4.7	-0.5	0.2	45.7	2.2	14.1	3.4	3.1	0.4	457.8	11.1	3.8
2023 Q1	1.4	-5.7	-4.7	69.2	1.3	20.0	1.0	-17.6	15.2	538.5	23.8	2.0
Q2	0.4	-9.3	-8.0	85.7	-0.3	24.0	-0.6	-2.4	14.4	325.9	22.4	0.5
Q3	-0.2	-11.4	-9.9	76.3	-3.3	21.9	-2.2	10.3	18.4	65.5	19.9	-1.2
2023 May	0.7	-8.1	-7.0	80.9	0.3	22.6	-0.1	-10.8	15.3	423.4	23.6	1.0
June	0.4	-9.3	-8.0	85.7	-0.3	24.0	-0.6	-2.4	14.4	325.9	22.4	0.5
July	0.1	-10.5	-9.1	85.2	-1.0	23.9	-1.4	-1.7	16.7	226.2	21.1	-0.4
Aug.	-0.2	-11.9	-10.4	85.9	-2.3	23.8	-2.4	-1.2	16.9	162.5	20.4	-1.3
Sep.	-0.2	-11.4	-9.9	76.3	-3.3	21.9	-2.2	10.3	18.4	65.5	19.9	-1.2
Oct. [p)]	-0.4	-11.5	-10.0	72.9	-3.9	21.4	-2.2	15.9	14.4	266.8	22.9	-1.0

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	2,966.3	2,514.2	308.7	140.0	3.5	7,664.8	4,965.6	438.4	2,260.0	0.9	1,118.2	237.4	498.6
2021	3,230.1	2,804.8	289.4	128.4	7.4	8,087.9	5,380.8	374.1	2,332.3	0.7	1,273.6	229.0	546.9
2022	3,360.6	2,722.2	497.0	134.9	6.4	8,373.7	5,536.8	444.9	2,391.1	0.9	1,301.8	236.9	560.6
2022 Q4	3,360.6	2,722.2	497.0	134.9	6.4	8,373.7	5,536.8	444.9	2,391.1	0.9	1,301.8	236.9	560.6
2023 Q1	3,332.4	2,596.4	594.8	132.6	8.6	8,377.5	5,433.2	566.2	2,377.1	0.9	1,227.5	230.5	572.6
Q2	3,333.1	2,502.8	687.3	132.1	11.0	8,364.0	5,311.6	701.6	2,350.0	0.8	1,185.3	229.1	564.0
Q3	3,323.4	2,439.0	737.6	131.9	14.8	8,351.4	5,205.9	847.5	2,297.1	0.8	1,215.4	212.6	565.3
2023 May	3,316.0	2,530.6	642.4	132.0	11.1	8,369.5	5,353.9	654.3	2,360.4	0.9	1,214.9	227.4	559.2
June	3,333.1	2,502.8	687.3	132.1	11.0	8,364.0	5,311.6	701.6	2,350.0	0.8	1,185.3	229.1	564.0
July	3,310.4	2,468.0	700.1	131.6	10.7	8,363.4	5,269.6	755.0	2,338.0	0.8	1,180.3	216.6	564.1
Aug.	3,311.3	2,448.4	720.1	132.1	10.8	8,360.0	5,238.0	804.5	2,316.7	0.8	1,160.9	217.5	560.3
Sep.	3,323.4	2,439.0	737.6	131.9	14.8	8,351.4	5,205.9	847.5	2,297.1	0.8	1,215.4	212.6	565.3
Oct. [p]	3,325.7	2,407.7	773.8	131.4	12.9	8,345.7	5,149.8	909.0	2,286.2	0.7	1,205.7	210.7	546.5
Transactions													
2020	511.4	465.7	55.5	-6.9	-3.0	612.6	561.7	-53.7	104.6	0.0	158.9	20.9	35.5
2021	249.9	274.5	-21.3	-6.9	3.6	422.2	411.3	-65.0	76.1	-0.2	160.0	-10.4	46.0
2022	119.9	-90.8	206.2	5.9	-1.4	296.5	167.9	74.6	53.9	0.1	3.2	8.2	14.6
2022 Q4	6.0	-106.3	112.5	1.5	-1.7	30.7	-52.9	75.1	8.6	-0.1	-151.3	-6.2	11.6
2023 Q1	-37.3	-136.4	97.5	-0.6	2.3	-25.3	-132.2	115.9	-9.1	0.1	-73.9	-5.1	8.2
Q2	1.0	-92.1	91.3	-0.5	2.4	-13.4	-121.4	135.2	-27.1	-0.1	-43.3	-1.2	-11.3
Q3	-13.1	-65.8	49.2	-0.2	3.7	-14.7	-111.1	149.3	-52.9	0.0	29.8	-17.3	1.1
2023 May	-15.3	-37.5	21.2	0.1	0.8	-2.9	-40.5	47.1	-9.4	0.0	-1.5	-1.6	-3.2
June	20.3	-24.7	44.8	0.1	0.0	-4.4	-41.6	47.6	-10.4	-0.1	-29.1	1.9	4.8
July	-20.8	-33.4	13.3	-0.4	-0.2	0.0	-41.7	53.7	-12.0	0.0	-2.8	-12.4	0.1
Aug.	-0.8	-20.9	19.6	0.4	0.0	-4.9	-36.7	53.1	-21.3	0.0	-19.2	0.6	-4.0
Sep.	8.5	-11.5	16.3	-0.2	3.9	-9.8	-32.7	42.5	-19.7	0.0	51.8	-5.5	5.0
Oct. [p]	4.2	-30.0	36.4	-0.4	-1.9	-5.4	-56.0	61.5	-10.9	-0.1	-8.9	-1.8	-18.8
Growth rates													
2020	20.6	22.5	21.6	-4.6	-45.1	8.7	12.8	-10.9	4.9	-5.4	15.9	9.6	7.7
2021	8.4	10.9	-6.9	-5.0	103.4	5.5	8.3	-14.8	3.4	-18.4	14.2	-4.3	9.3
2022	3.7	-3.2	70.1	4.6	-16.4	3.7	3.1	20.1	2.3	19.9	0.5	3.6	2.7
2022 Q4	3.7	-3.2	70.1	4.6	-16.4	3.7	3.1	20.1	2.3	19.9	0.5	3.6	2.7
2023 Q1	1.2	-9.4	105.8	3.1	-18.7	2.0	-1.3	56.8	1.4	-10.8	-8.4	0.3	3.2
Q2	0.7	-12.7	125.2	2.1	10.4	1.1	-4.5	97.1	-0.3	20.9	-14.1	0.5	-2.4
Q3	-1.3	-14.1	90.6	0.2	83.5	-0.3	-7.4	127.5	-3.4	-14.5	-16.3	-12.3	1.8
2023 May	0.4	-11.9	119.5	2.3	10.6	1.3	-3.6	83.2	0.3	18.6	-10.4	-1.4	-3.1
June	0.7	-12.7	125.2	2.1	10.4	1.1	-4.5	97.1	-0.3	20.9	-14.1	0.5	-2.4
July	-0.6	-14.1	118.3	1.9	12.7	0.6	-5.7	111.8	-1.1	6.4	-15.2	-9.3	-1.8
Aug.	-2.2	-15.6	107.5	0.8	37.5	0.2	-6.7	124.2	-2.4	-1.0	-18.8	-7.5	-2.4
Sep.	-1.3	-14.1	90.6	0.2	83.5	-0.3	-7.4	127.5	-3.4	-14.5	-16.3	-12.3	1.8
Oct. [p]	-2.0	-14.3	73.2	0.7	45.8	-0.5	-8.3	134.0	-4.0	-28.7	-10.7	-15.9	-2.9

Source: ECB.

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

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

3) Including non-profit institutions serving households.

4) 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	5,898.2	996.3	4,889.9	14,325.2	11,917.4	12,294.2	4,709.1	6,132.1	908.1	168.1	1,543.2	864.5
2021	6,531.5	994.3	5,535.3	14,805.8	12,340.5	12,722.7	4,864.8	6,372.6	941.9	161.1	1,577.2	888.1
2022	6,361.6	1,004.6	5,332.0	15,390.1	12,990.2	13,183.7	5,131.4	6,632.1	1,079.1	147.6	1,563.7	836.3
2022 Q4	6,361.6	1,004.6	5,332.0	15,390.1	12,990.2	13,183.7	5,131.4	6,632.1	1,079.1	147.6	1,563.7	836.3
2023 Q1	6,353.2	995.3	5,333.0	15,426.3	13,019.5	13,214.7	5,136.1	6,665.6	1,076.5	141.4	1,556.9	849.9
Q2	6,275.3	986.6	5,263.3	15,426.5	12,982.2	13,210.7	5,126.9	6,634.3	1,078.5	142.5	1,575.1	869.3
Q3	6,211.1	989.2	5,196.9	15,428.9	12,977.5	13,194.2	5,114.6	6,633.5	1,092.2	137.2	1,576.8	874.6
2023 May	6,269.2	990.4	5,253.1	15,439.5	12,999.3	13,229.3	5,133.3	6,632.0	1,092.7	141.3	1,577.8	862.4
June	6,275.3	986.6	5,263.3	15,426.5	12,982.2	13,210.7	5,126.9	6,634.3	1,078.5	142.5	1,575.1	869.3
July	6,239.5	984.3	5,229.8	15,438.4	12,988.8	13,215.7	5,125.2	6,628.6	1,099.6	135.4	1,573.3	876.4
Aug.	6,256.9	987.3	5,244.5	15,414.5	12,963.8	13,186.6	5,119.9	6,632.8	1,079.9	131.2	1,573.7	877.1
Sep.	6,211.1	989.2	5,196.9	15,428.9	12,977.5	13,194.2	5,114.6	6,633.5	1,092.2	137.2	1,576.8	874.6
Oct. [p)]	6,195.8	987.3	5,183.3	15,451.1	13,008.2	13,223.1	5,112.6	6,641.6	1,119.0	135.1	1,562.6	880.2
Transactions												
2020	1,037.1	12.8	1,024.1	736.4	538.3	558.9	288.5	209.1	22.6	18.0	170.0	28.1
2021	663.0	-0.9	673.6	563.0	475.8	509.2	176.9	261.7	47.4	-10.1	78.0	9.2
2022	175.9	9.4	165.7	634.1	623.7	679.9	269.4	242.2	125.5	-13.4	16.9	-6.4
2022 Q4	31.1	3.0	27.5	19.4	-8.4	37.1	-7.0	26.9	-16.5	-11.8	15.7	12.1
2023 Q1	-72.9	-17.5	-55.3	2.5	3.7	7.8	-2.2	14.8	-3.0	-5.9	-9.7	8.5
Q2	-75.1	-8.6	-67.0	0.9	-32.0	-1.0	-5.2	-28.6	0.8	1.0	17.6	15.3
Q3	-19.4	1.6	-20.7	8.0	-0.2	-11.6	-8.5	1.6	12.1	-5.3	2.4	5.8
2023 May	-57.2	6.8	-64.4	9.8	-13.2	10.6	3.9	-34.2	20.0	-2.8	16.5	6.5
June	10.8	-3.7	14.7	-8.3	-10.3	-13.1	-3.6	3.9	-11.9	1.3	-1.9	3.9
July	-34.9	-2.4	-32.6	15.0	11.0	8.5	0.7	-4.8	22.1	-7.0	-2.1	6.0
Aug.	14.9	2.4	12.9	-23.5	-24.1	-27.9	-3.9	4.2	-20.1	-4.3	0.3	0.3
Sep.	0.6	1.6	-0.9	16.5	12.9	7.8	-5.3	2.2	10.1	6.0	4.1	-0.5
Oct. [p)]	-17.2	0.9	-18.3	31.5	36.5	33.2	2.3	9.8	26.2	-1.8	-13.3	8.3
Growth rates												
2020	22.1	1.3	27.8	5.4	4.7	4.7	6.5	3.5	2.5	10.2	11.4	3.3
2021	11.3	-0.1	13.8	3.9	4.0	4.2	3.8	4.3	5.2	-4.6	5.2	1.0
2022	2.7	0.9	3.0	4.3	5.0	5.4	5.5	3.8	13.3	-7.9	1.1	-0.6
2022 Q4	2.7	0.9	3.0	4.3	5.0	5.4	5.5	3.8	13.3	-7.9	1.1	-0.6
2023 Q1	-0.1	-1.5	0.1	2.9	3.5	3.9	4.5	2.9	5.0	-9.7	-1.3	2.0
Q2	-2.5	-2.3	-2.5	1.5	1.4	2.0	2.4	1.1	0.6	-12.2	1.0	4.5
Q3	-2.1	-2.1	-2.2	0.2	-0.3	0.2	-0.4	0.2	-0.6	-13.9	1.7	5.0
2023 May	-2.2	-1.7	-2.3	2.2	2.1	2.8	3.2	1.5	3.4	-13.0	2.3	2.5
June	-2.5	-2.3	-2.5	1.5	1.4	2.0	2.4	1.1	0.6	-12.2	1.0	4.5
July	-2.8	-2.3	-3.0	1.3	1.1	1.6	1.6	0.7	3.2	-15.0	1.1	5.4
Aug.	-2.1	-2.1	-2.1	0.6	0.1	0.7	0.1	0.4	0.4	-13.9	1.7	5.2
Sep.	-2.1	-2.1	-2.2	0.2	-0.3	0.2	-0.4	0.2	-0.6	-13.9	1.7	5.0
Oct. [p)]	-2.6	-1.8	-2.8	0.4	0.0	0.4	-0.9	0.2	4.7	-14.2	1.3	5.0

Source: ECB.

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

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

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

4) Including non-profit institutions serving households.

5 Financing conditions and credit developments

5.4 MFI loans to euro area non-financial corporations and households [1)]

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

	Non-financial corporations [2)]					Households [3)]				
	Total		Up to 1 year	Over 1 and up to 5 years	Over 5 years	Total		Loans for consumption	Loans for house purchase	Other loans
		Adjusted loans [4)]					Adjusted loans [4)]			
	1	2	3	4	5	6	7	8	9	10
Outstanding amounts										
2020	4,709.1	4,830.6	897.6	1,008.9	2,802.6	6,132.1	6,401.8	700.5	4,724.9	706.7
2021	4,864.8	4,995.8	889.0	1,005.2	2,970.7	6,372.6	6,637.3	698.3	4,970.8	703.5
2022	5,131.4	5,139.0	967.2	1,078.9	3,085.3	6,632.1	6,831.4	717.2	5,214.6	700.3
2022 Q4	5,131.4	5,139.0	967.2	1,078.9	3,085.3	6,632.1	6,831.4	717.2	5,214.6	700.3
2023 Q1	5,136.1	5,150.3	940.7	1,092.7	3,102.6	6,665.6	6,870.6	723.6	5,236.0	706.0
Q2	5,126.9	5,147.0	924.2	1,088.2	3,114.5	6,634.3	6,868.1	726.0	5,207.9	700.4
Q3	5,114.6	5,124.5	902.8	1,085.4	3,126.5	6,633.5	6,863.0	731.6	5,210.5	691.4
2023 May	5,133.3	5,151.1	926.2	1,095.2	3,111.9	6,632.0	6,871.2	726.0	5,204.6	701.5
June	5,126.9	5,147.0	924.2	1,088.2	3,114.5	6,634.3	6,868.1	726.0	5,207.9	700.4
July	5,125.2	5,144.4	919.8	1,088.6	3,116.8	6,628.6	6,863.4	727.4	5,205.0	696.2
Aug.	5,119.9	5,124.1	902.0	1,085.2	3,132.8	6,632.8	6,863.9	729.8	5,209.0	693.9
Sep.	5,114.6	5,124.5	902.8	1,085.4	3,126.5	6,633.5	6,863.0	731.6	5,210.5	691.4
Oct. [p)]	5,112.6	5,120.1	896.8	1,087.4	3,128.4	6,641.6	6,861.9	731.0	5,222.6	687.9
Transactions										
2020	288.5	325.6	-53.8	138.4	203.9	209.1	193.4	-11.7	210.7	10.2
2021	176.9	208.8	-1.6	2.3	176.1	261.7	266.8	10.7	255.0	-3.9
2022	269.4	309.1	78.6	77.5	113.3	242.2	249.7	22.6	218.5	1.1
2022 Q4	-7.0	22.2	-28.7	18.4	3.4	26.9	35.8	4.9	22.6	-0.5
2023 Q1	-2.2	5.7	-24.1	11.1	10.9	14.8	22.0	4.6	15.0	-4.7
Q2	-5.2	-1.2	-15.0	-3.0	12.8	-28.6	-0.6	3.9	-27.6	-4.9
Q3	-8.5	-18.8	-21.8	-3.3	16.6	1.6	-2.2	7.6	2.7	-8.8
2023 May	3.9	1.2	-6.5	0.9	9.4	-34.2	-1.9	1.4	-33.2	-2.4
June	-3.6	-2.3	-0.5	-6.6	3.4	3.9	-1.5	0.5	4.1	-0.7
July	0.7	-0.9	-3.1	0.6	3.2	-4.8	-3.7	2.3	-2.9	-4.2
Aug.	-3.9	-18.7	-18.9	-3.2	18.2	4.2	0.6	2.7	3.9	-2.3
Sep.	-5.3	0.8	0.1	-0.6	-4.9	2.2	1.0	2.6	1.8	-2.2
Oct. [p)]	2.3	-0.9	-4.7	3.0	4.0	9.8	0.1	0.2	12.3	-2.7
Growth rates										
2020	6.5	7.1	-5.6	15.9	7.8	3.5	3.1	-1.6	4.7	1.5
2021	3.8	4.3	-0.2	0.2	6.3	4.3	4.2	1.5	5.4	-0.6
2022	5.5	6.4	8.8	7.7	3.8	3.8	3.8	3.2	4.4	0.2
2022 Q4	5.5	6.4	8.8	7.7	3.8	3.8	3.8	3.2	4.4	0.2
2023 Q1	4.5	5.3	4.0	9.1	3.1	2.9	2.9	3.1	3.3	-0.7
Q2	2.4	3.0	-1.9	6.3	2.5	1.1	1.7	2.5	1.3	-1.7
Q3	-0.4	0.2	-9.0	2.2	1.4	0.2	0.8	2.9	0.2	-2.7
2023 May	3.2	4.0	-0.6	8.2	2.7	1.5	2.1	2.8	1.8	-1.5
June	2.4	3.0	-1.9	6.3	2.5	1.1	1.7	2.5	1.3	-1.7
July	1.6	2.2	-3.1	5.0	2.0	0.7	1.3	2.6	0.8	-2.1
Aug.	0.1	0.7	-7.8	2.6	1.8	0.4	1.0	3.0	0.5	-2.5
Sep.	-0.4	0.2	-9.0	2.2	1.4	0.2	0.8	2.9	0.2	-2.7
Oct. [p)]	-0.9	-0.3	-9.6	1.5	1.1	0.2	0.6	2.8	0.3	-3.1

Source: ECB.

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

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

3) Including non-profit institutions serving households.

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

5 Financing conditions and credit developments

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

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

	MFI liabilities						MFI assets			
	Central government holdings [2)]	Longer-term financial liabilities vis-à-vis other euro area residents					Net external assets	Other		
		Total	Deposits with an agreed maturity of over 2 years	Deposits redeemable at notice of over 3 months	Debt securities with a maturity of over 2 years	Capital and reserves		Total	Repos with central counter-parties [3)]	Reverse repos to central counter-parties [3)]
	1	2	3	4	5	6	7	8	9	10
Outstanding amounts										
2020	711.2	6,952.7	1,915.1	42.1	1,988.5	3,006.9	1,441.7	482.0	136.7	141.1
2021	736.9	6,881.5	1,838.9	37.1	1,994.5	3,010.9	1,377.6	411.1	128.5	136.8
2022	649.3	6,746.8	1,782.6	45.9	2,116.1	2,802.3	1,333.4	379.6	137.8	147.6
2022 Q4	649.3	6,746.8	1,782.6	45.9	2,116.1	2,802.3	1,333.4	379.6	137.8	147.6
2023 Q1	574.1	6,915.1	1,791.9	55.5	2,171.6	2,896.2	1,426.2	334.4	152.1	165.8
Q2	485.8	6,985.8	1,806.8	61.7	2,231.2	2,886.1	1,465.2	295.1	168.6	172.6
Q3	456.3	7,137.4	1,825.0	72.9	2,361.9	2,877.6	1,635.2	312.4	153.8	163.3
2023 May	498.9	6,998.1	1,804.9	58.9	2,213.7	2,920.5	1,484.0	309.8	174.0	184.1
June	485.8	6,985.8	1,806.8	61.7	2,231.2	2,886.1	1,465.2	295.1	168.6	172.6
July	464.6	7,096.5	1,807.0	64.5	2,319.6	2,905.4	1,547.9	276.9	153.8	156.4
Aug.	439.8	7,138.2	1,807.1	68.0	2,340.6	2,922.4	1,580.4	253.8	165.9	161.8
Sep.	456.3	7,137.4	1,825.0	72.9	2,361.9	2,877.6	1,635.2	312.4	153.8	163.3
Oct. [p)]	440.3	7,216.8	1,819.5	77.7	2,411.0	2,908.6	1,740.9	241.4	163.0	151.4
Transactions										
2020	288.3	-36.9	-14.8	-8.0	-101.4	87.3	-66.8	135.9	-43.6	-47.5
2021	26.3	-38.6	-74.9	-5.0	-40.0	81.4	-111.2	-118.2	-8.3	-4.3
2022	-84.5	37.0	-89.7	-4.4	14.8	116.3	-71.2	-195.7	10.5	17.9
2022 Q4	2.2	57.3	-12.4	1.1	50.5	18.1	48.5	-103.2	-10.2	1.0
2023 Q1	-81.9	89.4	5.9	5.0	67.3	11.3	63.7	-43.6	15.0	18.9
Q2	-88.1	95.1	13.9	6.3	60.1	14.9	93.0	-73.1	16.5	6.7
Q3	-29.7	90.0	17.3	11.2	38.5	23.1	127.9	-60.5	-13.0	-6.0
2023 May	-73.9	38.1	-3.3	2.0	28.9	10.5	18.8	-13.4	20.7	22.2
June	-13.0	31.4	2.9	2.8	24.4	1.3	37.9	-29.4	-5.4	-11.5
July	-21.2	29.0	0.8	2.8	16.1	9.3	42.1	-57.5	-14.8	-16.2
Aug.	-24.8	27.1	0.1	3.5	15.6	7.9	28.1	-36.4	12.1	5.4
Sep.	16.3	33.9	16.3	4.9	6.8	5.9	57.8	33.3	-10.3	4.8
Oct. [p)]	-16.0	27.3	-4.6	4.8	26.5	0.7	64.5	-87.4	9.3	-12.0
Growth rates										
2020	82.2	-0.5	-0.8	-15.9	-4.7	3.0	-	-	-24.2	-25.2
2021	3.7	-0.6	-3.9	-11.9	-2.0	2.7	-	-	-6.0	-3.0
2022	-11.5	0.6	-4.8	-13.0	0.6	4.0	-	-	7.9	12.7
2022 Q4	-11.5	0.6	-4.8	-13.0	0.6	4.0	-	-	7.9	12.7
2023 Q1	-22.6	2.3	-3.4	-0.5	4.9	4.0	-	-	-4.2	1.3
Q2	-37.6	3.5	-2.2	25.4	8.7	3.0	-	-	1.7	10.2
Q3	-30.3	4.9	1.4	48.7	10.4	2.4	-	-	5.7	14.1
2023 May	-34.5	3.2	-2.5	17.8	7.5	3.5	-	-	-4.2	8.2
June	-37.6	3.5	-2.2	25.4	8.7	3.0	-	-	1.7	10.2
July	-38.9	3.9	-1.5	32.5	9.7	2.7	-	-	-10.9	-1.6
Aug.	-34.9	4.5	-0.4	37.0	10.1	2.9	-	-	5.9	11.5
Sep.	-30.3	4.9	1.4	48.7	10.4	2.4	-	-	5.7	14.1
Oct. [p)]	-34.5	5.4	1.7	57.7	11.1	2.7	-	-	14.8	-0.6

Source: ECB.

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

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

3) Not adjusted for seasonal effects.

6 Fiscal developments

6.1 Deficit/surplus

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

	Deficit (-)/surplus (+)					Memo item: Primary deficit (-)/ surplus (+)
	Total	Central government	State government	Local government	Social security funds	
	1	2	3	4	5	6
2019	-0.6	-1.0	0.1	0.1	0.3	1.0
2020	-7.1	-5.8	-0.4	0.0	-0.9	-5.5
2021	-5.2	-5.2	0.0	0.1	0.0	-3.8
2022	-3.6	-3.9	0.0	0.0	0.3	-1.9
2022 Q3	-3.2	.	.	.	.	-1.6
Q4	-3.6	.	.	.	.	-1.9
2023 Q1	-3.7	.	.	.	.	-2.0
Q2	-3.8	.	.	.	.	-2.1

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

6.2 Revenue and expenditure

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

	Revenue						Expenditure						
	Total	Current revenue				Capital revenue	Total	Current expenditure					Capital expenditure
			Direct taxes	Indirect taxes	Net social contributions				Compen-sation of employees	Intermediate consumption	Interest	Social benefits	
	1	2	3	4	5	6	7	8	9	10	11	12	13
2019	46.3	45.8	12.9	13.1	15.0	0.5	46.9	43.2	9.9	5.4	1.6	22.4	3.8
2020	46.4	45.9	12.9	12.7	15.5	0.5	53.5	48.9	10.6	5.9	1.5	25.3	4.6
2021	47.0	46.2	13.2	13.1	15.1	0.8	52.2	47.2	10.2	5.9	1.5	23.9	5.0
2022	46.9	46.1	13.5	12.9	14.8	0.8	50.5	45.4	9.9	5.9	1.7	22.8	5.1
2022 Q3	47.1	46.4	13.6	13.1	14.9	0.7	50.3	45.4	9.9	5.9	1.6	22.9	4.9
Q4	46.9	46.1	13.5	12.9	14.8	0.8	50.5	45.4	9.9	5.9	1.7	22.8	5.1
2023 Q1	46.7	45.9	13.5	12.8	14.8	0.8	50.3	45.3	9.8	5.8	1.7	22.7	5.1
Q2	46.5	45.7	13.4	12.7	14.8	0.8	50.3	45.2	9.8	5.8	1.7	22.7	5.1

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
2019	84.1	3.0	13.2	67.8	45.8	30.8	38.3	7.7	76.3	15.6	27.9	40.6	82.7	1.3
2020	97.2	3.2	14.5	79.5	54.6	39.1	42.5	11.1	86.0	18.9	30.9	47.3	95.5	1.7
2021	94.7	3.0	13.8	77.9	55.2	41.3	39.5	9.8	84.9	17.5	30.1	47.1	93.3	1.4
2022	90.9	2.7	13.2	75.0	53.4	40.2	37.5	8.8	82.1	16.5	28.7	45.7	90.0	0.9
2022 Q3	92.2	2.9	13.5	75.8	.	.	.	.	.	.	.	.	.	.
Q4	90.9	2.7	13.2	75.0	.	.	.	.	.	.	.	.	.	.
2023 Q1	90.7	2.5	12.8	75.3	.	.	.	.	.	.	.	.	.	.
Q2	90.3	2.5	12.5	75.3	.	.	.	.	.	.	.	.	.	.

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
2019	-2.0	-1.0	0.1	0.2	0.1	0.0	0.0	0.2	-0.1	0.0	-1.2	0.9
2020	13.1	5.5	2.2	2.5	2.0	0.4	-0.1	0.1	-0.3	0.0	5.3	9.6
2021	-2.4	3.8	-0.2	0.6	0.4	0.1	0.0	0.1	-0.1	-0.7	-6.0	5.1
2022	-3.8	1.9	-0.3	-0.2	-0.7	0.2	0.1	0.2	0.6	-0.6	-5.4	2.7
2022 Q3	-4.5	1.6	-0.2	0.1	-0.4	0.3	0.0	0.2	0.4	-0.6	-6.0	2.6
Q4	-3.8	1.9	-0.3	-0.2	-0.7	0.2	0.1	0.2	0.6	-0.6	-5.4	2.7
2023 Q1	-3.8	2.0	-0.7	-0.7	-1.1	0.1	0.1	0.1	0.7	-0.7	-5.1	2.3
Q2	-3.1	2.1	-0.8	-1.0	-1.4	0.2	0.2	0.1	0.7	-0.5	-4.5	2.3

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

6.5 Government debt securities [1)]

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

	Debt service due within 1 year [2)]					Average residual maturity in years [3)]	Average nominal yields [4)]						
	Total	Principal		Interest			Outstanding amounts					Transactions	
			Maturities of up to 3 months		Maturities of up to 3 months		Total	Floating rate	Zero coupon	Fixed rate	Maturities of up to 1 year	Issuance	Redemption
	1	2	3	4	5	6	7	8	9	10	11	12	13
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	14.0	12.7	4.2	1.3	0.3	7.9	1.6	1.1	-0.4	1.9	1.9	-0.1	0.5
2022	13.2	11.9	4.2	1.3	0.3	8.0	1.6	1.2	0.4	1.8	1.9	1.1	0.5
2022 Q3	13.0	11.7	3.7	1.3	0.3	8.1	1.6	1.1	0.0	1.9	1.9	0.6	0.4
Q4	13.2	11.9	4.2	1.3	0.3	8.0	1.6	1.2	0.4	1.8	1.9	1.1	0.5
2023 Q1	13.5	12.3	4.2	1.2	0.3	8.1	1.8	1.3	1.0	1.9	2.0	2.1	0.7
Q2	13.6	12.3	3.6	1.3	0.3	8.1	1.9	1.4	1.5	1.9	2.0	2.8	1.1
2023 May	13.4	12.1	3.4	1.3	0.3	8.2	1.8	1.3	1.2	1.9	2.0	2.6	1.0
June	13.6	12.3	3.6	1.3	0.3	8.1	1.9	1.4	1.5	1.9	2.0	2.8	1.1
July	13.6	12.3	4.0	1.3	0.3	8.1	1.9	1.3	1.5	2.0	1.9	3.0	1.2
Aug.	13.5	12.2	4.0	1.3	0.3	8.1	1.9	1.4	1.7	2.0	1.9	3.2	1.4
Sep.	13.8	12.4	3.8	1.3	0.3	8.1	1.9	1.2	1.8	2.0	1.7	3.4	1.5
Oct.	13.3	12.0	3.5	1.4	0.3	8.2	2.0	1.2	1.9	2.0	1.7	3.4	1.7

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

6 Fiscal developments

6.6 Fiscal developments in euro area countries

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

	Belgium	Germany	Estonia	Ireland	Greece	Spain	France	Croatia	Italy	Cyprus
	1	2	3	4	5	6	7	8	9	10
	Government deficit (-)/surplus (+)									
2019	-2.0	1.5	0.1	0.5	0.9	-3.1	-3.1	0.2	-1.5	0.9
2020	-8.9	-4.3	-5.4	-5.0	-9.7	-10.1	-9.0	-7.3	-9.6	-5.7
2021	-5.4	-3.6	-2.5	-1.5	-7.0	-6.7	-6.5	-2.5	-8.8	-1.9
2022	-3.5	-2.5	-1.0	1.7	-2.4	-4.7	-4.8	0.1	-8.0	2.4
2022 Q3	-3.5	-1.8	-0.3	1.6	-3.1	-4.1	-4.3	0.4	-7.7	2.4
Q4	-3.5	-2.5	-1.0	1.7	-2.4	-4.7	-4.8	0.1	-8.0	2.4
2023 Q1	-4.0	-3.1	-1.3	2.1	-2.5	-4.3	-4.5	-0.2	-8.1	3.1
Q2	-4.1	-3.4	-1.7	2.2	-2.4	-4.4	-4.7	-0.4	-8.0	3.4
	Government debt									
2019	97.6	59.6	8.5	57.1	180.6	98.2	97.4	70.9	134.2	93.0
2020	111.8	68.8	18.6	58.1	207.0	120.3	114.6	86.8	154.9	114.9
2021	108.0	69.0	17.8	54.4	195.0	116.8	112.9	78.1	147.1	99.3
2022	104.3	66.1	18.5	44.4	172.6	111.6	111.8	68.2	141.7	85.6
2022 Q3	105.6	66.8	15.9	48.5	175.9	114.0	113.5	69.8	143.1	89.7
Q4	104.3	66.1	18.5	44.4	171.4	111.6	111.8	68.2	141.7	85.6
2023 Q1	106.4	65.7	17.2	43.6	168.6	111.2	112.4	69.1	140.9	83.1
Q2	106.0	64.6	18.5	43.1	166.5	111.2	111.9	66.5	142.4	85.3

	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Austria	Portugal	Slovenia	Slovakia	Finland
	11	12	13	14	15	16	17	18	19	20
	Government deficit (-)/surplus (+)									
2019	-0.5	0.5	2.2	0.5	1.8	0.6	0.1	0.7	-1.2	-0.9
2020	-4.5	-6.5	-3.4	-9.6	-3.7	-8.0	-5.8	-7.6	-5.4	-5.6
2021	-7.2	-1.1	0.6	-7.5	-2.2	-5.8	-2.9	-4.6	-5.2	-2.8
2022	-4.6	-0.7	-0.3	-5.7	-0.1	-3.5	-0.3	-3.0	-2.0	-0.8
2022 Q3	-4.3	0.8	0.6	-5.4	-0.3	-3.0	1.0	-3.0	-2.7	-0.8
Q4	-4.6	-0.7	-0.3	-5.7	-0.1	-3.5	-0.3	-3.0	-2.0	-0.8
2023 Q1	-4.3	-1.2	-0.6	-4.9	-0.1	-3.5	0.1	-3.2	-2.6	-0.9
Q2	-3.0	-1.3	-0.8	-4.3	-0.2	-4.1	0.0	-3.1	-3.4	-1.5
	Government debt									
2019	36.7	35.8	22.4	40.0	48.6	70.6	116.6	65.4	48.0	64.9
2020	42.2	46.2	24.6	52.2	54.7	83.0	134.9	79.6	58.9	74.7
2021	44.0	43.4	24.5	54.0	51.7	82.5	124.5	74.4	61.1	72.5
2022	41.0	38.1	24.7	52.3	50.1	78.4	112.4	72.3	57.8	73.3
2022 Q3	40.1	37.0	24.7	51.9	48.2	81.3	118.4	74.4	57.5	71.8
Q4	41.0	38.1	24.7	52.3	50.1	78.4	112.4	72.3	57.8	73.3
2023 Q1	43.0	38.1	28.4	52.4	48.3	80.3	112.4	72.0	58.0	73.3
Q2	39.5	38.1	28.2	50.7	46.9	78.6	110.1	70.5	59.6	74.6

Source: Eurostat.

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

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