The transmission of monetary policy tightening and medium-term growth prospects

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Activity and unemployment

Real GDP
(index: Q4 2019 = 100)

Sources: Eurostat, September 2023 ECB staff macroeconomic projections for the euro area (MPE) and December 2019 Eurosystem staff macroeconomic projections for the euro area (BMPE).

Unemployment rate
(percentages)

Sources: Eurostat and September 2023 ECB staff projections.
Note: The latest observation is for the second quarter of 2023.
Headline inflation, measures of underlying inflation, and inflation projections and expectations
(annual percentage changes)

Sources: Eurostat, ECB staff calculations and September 2023 ECB staff projections.
Notes: The measures in the range of underlying indicators include HICPX, HICP excluding energy and unprocessed food, HICPXX, Persistent and Common Component of Inflation (PCCI), PCCI excluding energy, Supercore, domestic inflation, trimmed mean 10%, trimmed mean 30% and weighted median. The latest observations are for October 2023 for HICP, HICPX (flash release) and September 2023 for the rest. Market-based indicators of inflation compensation are based on inflation-linked swap (ILS) data as on 30 October 2023. The cut-off date for technical assumptions in the September 2023 ECB staff projections was 22 August 2023 and the macroeconomic projections for the euro area (MPE) were finalised on 30 August 2023.
Measures of underlying inflation

(annual percentage changes)

Sources: Eurostat and ECB calculations.
Notes: The adjusted measures exclude energy and supply bottleneck shocks using a large structural vector autoregression identified with zero and sign restrictions (see Banbura, M., Bobeica, E. and Martínez-Hernández, C. (2023), “What drives core inflation? The role of supply shocks”, forthcoming). Measures included: HICPX, HICPXX, HICP excluding energy, HICP excluding unprocessed food and energy, Supercore, PCCI and PCCI excluding energy. The latest observations are for October 2023 (flash estimate) for HICPX, HICP excluding energy and HICP excluding unprocessed food and energy (standard measures) and September 2023 for the rest.

Measures of underlying services inflation

(annual percentage changes)

Sources: Eurostat and ECB calculations.
Note: The latest observations are for October 2023 (flash estimate) for services and September 2023 for the rest.
Corporate Telephone Survey results for wages and profit margins

**CTS: wage expectations for 2023 and 2024**
(percentages)

Source: October 2023 Corporate Telephone Survey (CTS).

**CTS: implied profit margins**
(average of CTS scores)

Notes: The score is calculated as the difference between the selling price score and a simple average of the input cost and wage scores. While past and future selling and input price scores refer to developments in the previous and next quarters, past and future wage scores refer to developments in the previous and next year. The latest observations are for the third quarter of 2023.
Forward curve

**€STR forward curve**

(percentages per annum)

Sources: Bloomberg and ECB calculations.

Note: The latest observation for “Realised €STR” is for 6 November 2023.
Decomposition of changes in ten-year nominal OIS rate since previous Governing Council meetings

(basis points)

Term premia component
Expectations component
Ten-year nominal OIS rate

Sources: Refinitiv and ECB calculations.
Notes: The decomposition of the ten-year spot overnight index swap (OIS) rate into expected rates and term premia is based on an affine term structure model fitted to the euro area OIS curve. The estimation method follows Joslin, S., Singleton, K. and Zhu, H. (2011), “A New Perspective on Gaussian Dynamic Term Structure Models”, Review of Financial Studies, Vol. 24, No 3, pp. 926-970. The euro area real rate is calculated by subtracting the ILS rate from the nominal OIS rate. Differences between decompositions (bars) and observed changes (diamonds) reflect model residuals. The latest observations are for 30 October 2023.

Term structure of real forward rates

(percentages)

Latest (30 October 2023)
Sep GovC (13 September 2023)
Cutoff Sep MPE (22 August 2023)

Sources: Bloomberg, Refinitiv and ECB calculations.
Notes: The euro area real forward rates are calculated by subtracting the inflation-linked swap forward rates from the nominal OIS forward rates for each maturity. 13 September 2012 is for the September Governing Council meeting. 22 August 2023 is for the cut-off of the September ECB staff macroeconomic projections. The latest observations are for 30 October 2023.
Net debt financing flows of firms
(left scale: average monthly flows in EUR billions; right scale: annual percentage changes)

Changes in credit standards for loans to firms and contributing factors
(net percentages)

Changes in demand for loans to firms and contributing factors
(net percentages)

Sources: ECB (BSI, CSEC) and ECB calculations.
Notes: The seasonal adjustment for the net issuance of debt securities is not official. Monetary financial institution (MFI) loans are adjusted for sales, securitisation and cash pooling. The latest observations are for September 2023.

Source: ECB (BLS).
Notes: “Other factors” refer to further factors mentioned by banks as having contributed to changes in credit standards. The latest observations are for the third quarter of 2023.
Bank loans to households
(Left scale: average monthly flows in EUR billions; right scale: annual percentage changes)

Household loans, credit standards and loan demand

Changes in credit standards for loans to households and contributing factors
(net percentages)

Changes in demand for loans to households and contributing factors
(net percentages)

Sources: ECB (BSI) and ECB calculations.
Notes: MFI loans are adjusted for sales and securitisation. The latest observations are for September 2023.

Source: ECB (BLS).
Notes: "Other factors" refer to further factors mentioned by banks as having contributed to changes in credit standards. The latest observations are for the third quarter of 2023.

Source: ECB (BLS).
Notes: "Other financing needs" as unweighted average of "M&A and corporate restructuring" and "debt refinancing/restructuring and renegotiation"; "Use of alternative finance" as unweighted average of "internal financing", "loans from other banks", "loans from non-banks", "issuance/redemption of debt securities" and "issuance/redemption of equity". The latest observations are for the third quarter of 2023.
Survey of Monetary Analysts

Median deposit facility rate (DFR) expectations (percentages per annum)

Real GDP growth projections (percentages per annum)

Sources: Survey of Monetary Analysts (SMA), Bloomberg and ECB calculations.
Note: The premia and spread-adjusted €STR forward curve (red triangles) refers to the plain €STR forward curve adjusted for term premia and the spread between the DFR and €STR on 9 October 2023, which was 10 basis points.
Medium-term growth prospects

- Monetary policy and medium-term growth: roles of stable demand and stable financing conditions in stimulating investment and innovation
- Demographics: area-wide; country-level
- Labour market and education policies: participation rates; working from home; skill levels; adaptability
- Market dynamism; EU single market; digitisation; geo-economic fragmentation; institutional quality
- Preserving competitiveness: relative cost base
- Green transition and potential output
Dynamic response of cyclically adjusted total factor productivity (TFP) to a 100 basis point decrease in nominal interest rates

GDP growth and expected evolution of labour force

Contributions to euro area GDP growth
(four-year average annual percentage change and percentage point contributions)

Expected evolution of labour force
(millions)

Sources: ECB calculations based on data from AMECO, Eurostat.
Note: Annual value for 2023 calculated as an average of the first two quarters.

Institutional quality in EU Member States

(score ranging from -250 to 250)

Source: World Bank Worldwide Governance Indicators.
Notes: Scores reflect the average of the four measurable governance indicators: rule of law, regulatory quality, government effectiveness and control of corruption. Higher values indicate better governance. A score of 250 would reflect that a country is the global best performer in all four subcategories. Euro area average in unchanged composition. Euro area countries are in blue, non-euro area EU countries are in yellow.
Euro area countries of central and eastern Europe: inflation and unit labour costs

**HICP and components**
(percentage changes from January 2020 to August 2023 and percentage point contributions – deviations from the euro area)

**Unit labour costs and components**
(percentage changes from Q4 2019 to Q2 2023 and percentage point contributions)

Sources: Eurostat and ECB calculations.
## Impacts of climate change on components of potential output

<table>
<thead>
<tr>
<th>Climate impact type</th>
<th>Capital</th>
<th>Labour supply</th>
<th>Total factor productivity</th>
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<tbody>
<tr>
<td><strong>Extreme weather and climate events</strong></td>
<td>• Destruction of capital</td>
<td>• Higher rates of mortality and sickness</td>
<td>• Bankruptcies/lack of finance cause reallocation, for better or worse</td>
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<td>• Opportunity to replace old, destroyed capital with new technology</td>
<td>• Disaster-induced migration</td>
<td>• Rebuilding process distracts management</td>
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<td>• Greater uncertainty reduces willingness to invest over long run</td>
<td>• Loss of education and skills</td>
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<tr>
<td><strong>Long-run climate change</strong></td>
<td>• Sectoral impacts e.g. agriculture, tourism</td>
<td>• Higher rates of mortality and sickness</td>
<td>• Adaptation capital less productive, diverts resources from innovation</td>
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<td>• Regional impacts (heat, coastal areas)</td>
<td>• Climate-induced migration</td>
<td>• Reduced labour efficiency</td>
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<td><strong>Climate policies and green transition</strong></td>
<td>• Increase in stranded assets</td>
<td>• Skill mismatches increasing structural unemployment</td>
<td>• Reallocation of output between firms within sectors may prove more or less efficient</td>
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<td>• Higher energy costs from carbon taxes reduce funds for investment</td>
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<td>• Environmental regulations reduce productivity; offset by innovation?</td>
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Impact of carbon taxes on potential output growth in Europe

Impact of a USD 40/tCO2 carbon tax shock on potential output growth (percentage points)

Sources: AMECO, World Bank and ECB calculations.
Firm-level impulse response functions of a tightening of environmental policy on total factor productivity growth of high-emission firms (percentage points)


Notes: Impulse response function of a 1 percentage point tightening in environmental policy stringency on a firm’s total factor productivity growth over five years for market (e.g. taxes), non-market (e.g. emission limits) and technology support (e.g. R&D subsidies) policies. High-emission firms are identified as those in the top half of the carbon emission distribution. Shaded areas show the 68% and 90% confidence intervals. See Lopez-Garcia, P. (2023), “Testing the Porter hypothesis: environmental regulation and productivity growth in the euro area”, in Parker, M. (2023), “How climate change affects potential output”, Economic Bulletin, Issue 6, ECB.
Economic activity’s reliance on nature

Direct and indirect dependency of euro area non-financial corporations on ecosystem services
(dependency scores)

Sources: ENCORE, EXIOBASE, AnaCredit and ECB calculations.
Notes: The euro area dependency score is computed as the average of the dependency scores of euro area non-financial corporations. A distinction is made between direct dependency (Scope 1) and indirect dependency (upstream) associated with the supply chain. See Ceglar, A. (2023), “Economic activity’s reliance on nature”, in Parker, M. (2023), “How climate change affects potential output”, Economic Bulletin, Issue 6, ECB.