



EUROPEAN CENTRAL BANK

EUROSYSTEM

Debate on "Is the inflation surge over and what are the lessons for monetary policy?"

The ECB and Its Watchers
XXIV, Frankfurt

20 March 2024

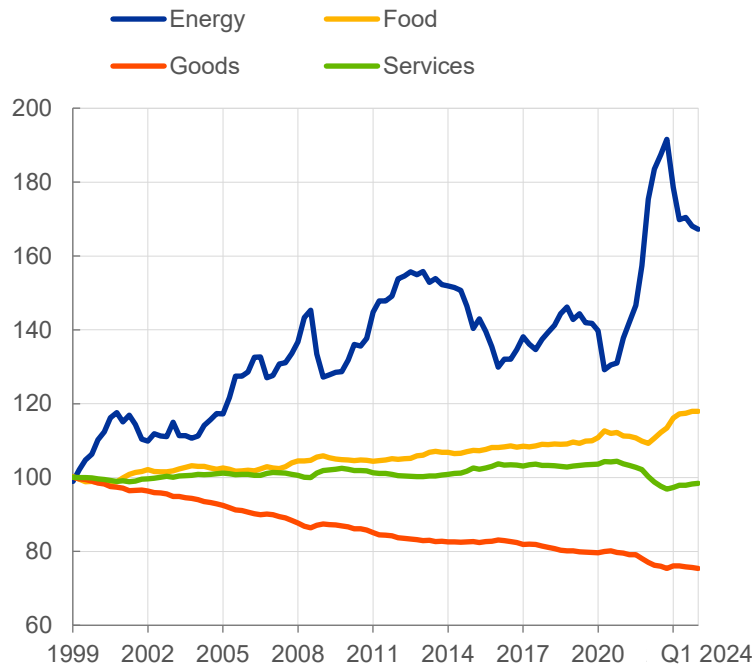
Philip R. Lane
Member of the Executive Board



Relative price developments

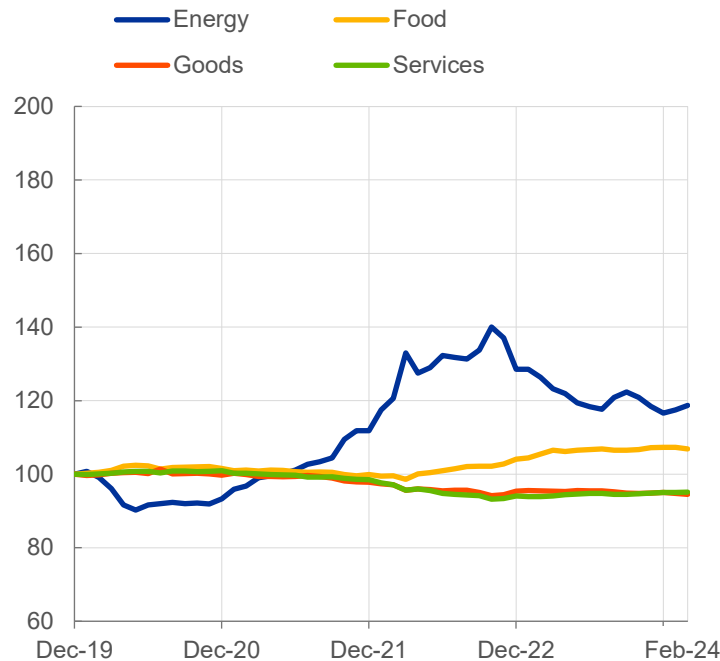
Price developments relative to HICP for various sub-components

(index: Q4 1998=100)



Price developments relative to HICP for various sub-components

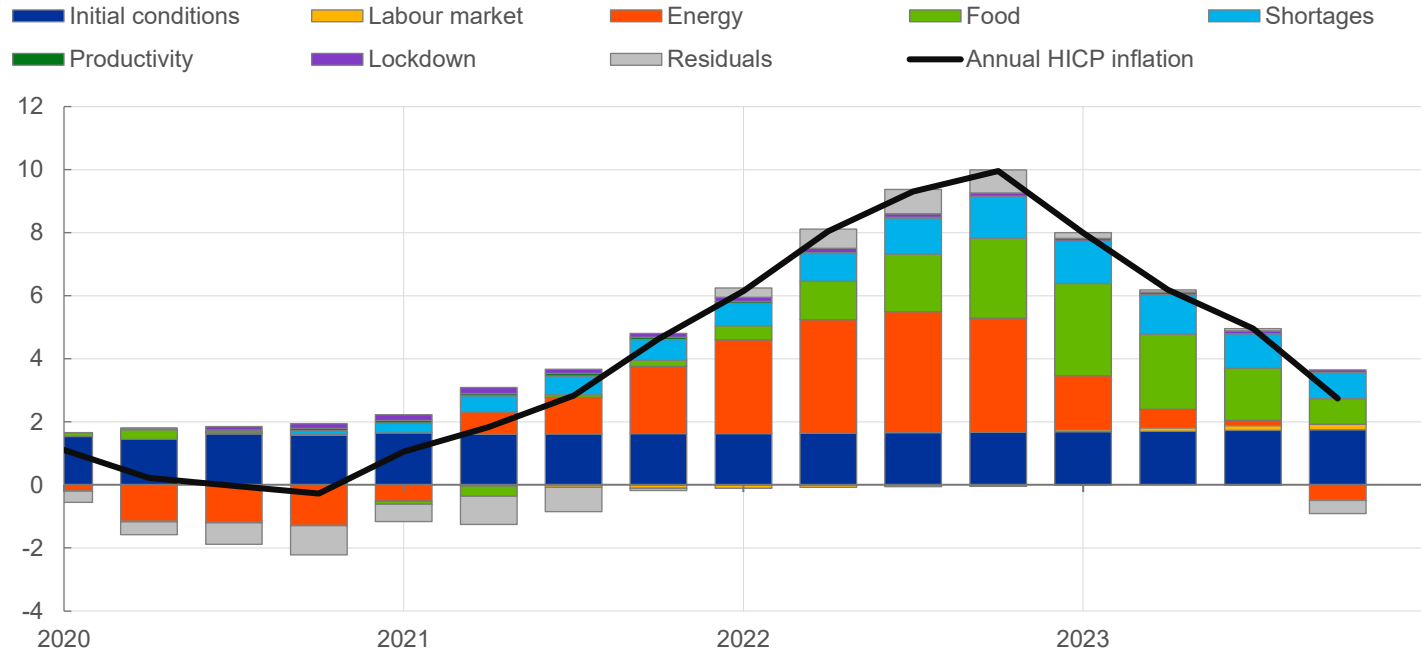
(index: December 2019=100)



Source: Eurostat.

Notes: Seasonally adjusted data for HICP, food, goods and services. Seasonally adjusted series for energy not available. Goods refers to non-energy industrial goods (NEIG). The latest observation is for Q1 2024 (based on January and February data) and February 2024.

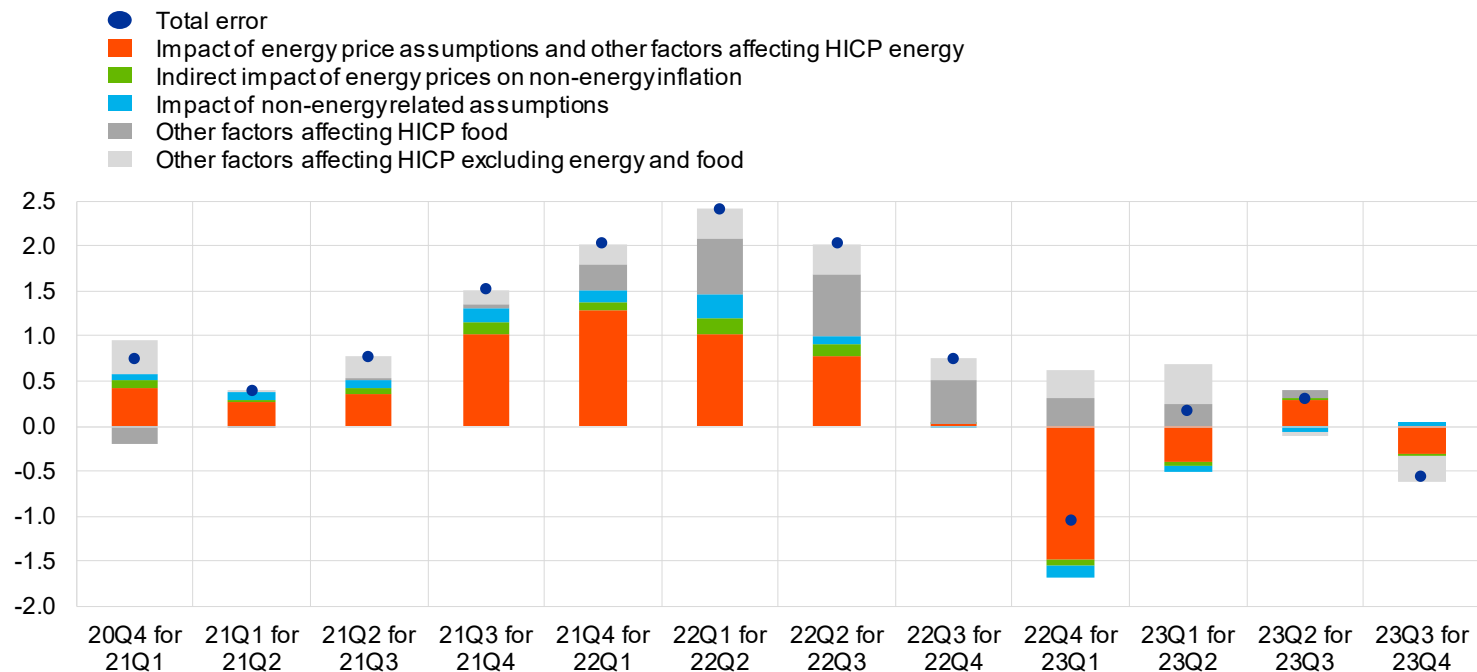
Sources of annual price inflation in the euro area (annual percentage changes and percentage point contributions)



Source: ECB calculations, based on Arce, Ó., Ciccarelli, M., Kornprobst, A., & Montes-Galdón, C. (2024). *What caused the euro area post-pandemic inflation?* ECB Occasional Paper, 343.

Notes: The figure shows a decomposition of the sources of annual HICP inflation between Q1 2020 and Q4 2023 based on the solution of the full model and the implied impulse response functions. The continuous line shows actual inflation, and the total net heights of the bars are the model's forecast of inflation in each period, given initial conditions up to the fourth quarter of 2019. The contributions of the residuals are computed as the difference between actual and simulated data. The dark blue portion of each bar shows the contribution of pre-2020 data. The coloured segments of each bar show the general equilibrium, fully dynamic contribution of each exogenous variable to inflation in that period, as implied by the estimated model. Shocks to the rate of change of the relative price of energy and food are constructed as deviations in the values of those variables from zero. Shocks to the shortages variable are constructed as deviations in the values from the sample mean. Shocks to the vacancy-to-unemployment ratio (labour market variable) are constructed as the actual value minus the value in the fourth quarter of 2019.

Decomposition of recent one-quarter-ahead HICP inflation errors in staff projections (percentage points)

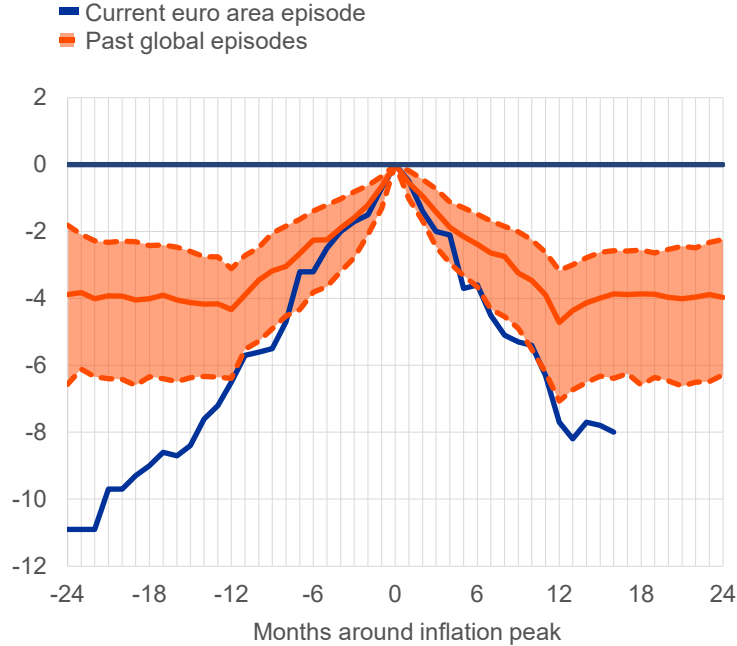


Source: ECB calculations.

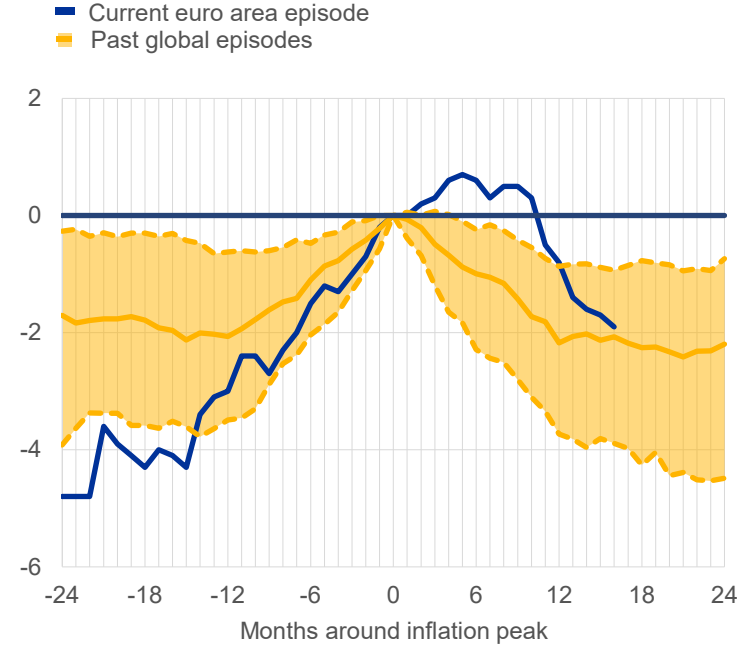
Notes: See also Chahad et al. (2023). "Total error" is the outturn minus the projection. "Indirect impact of energy prices on non-energy inflation" is the sum of the indirect effects of oil, gas and electricity prices. (For oil these are based on the elasticities derived from the Eurosystem staff macroeconomic models, and for gas and electricity these are computed assuming an elasticity proportional to the oil price shock.) "Impact of non-energy related assumptions" represents the assumptions for short and long-term interest rates, stock market prices, foreign demand, competitors' export prices, food prices and the exchange rate.

Historical comparison of inflation episodes in the euro area – headline and core

Headline (percentage points)



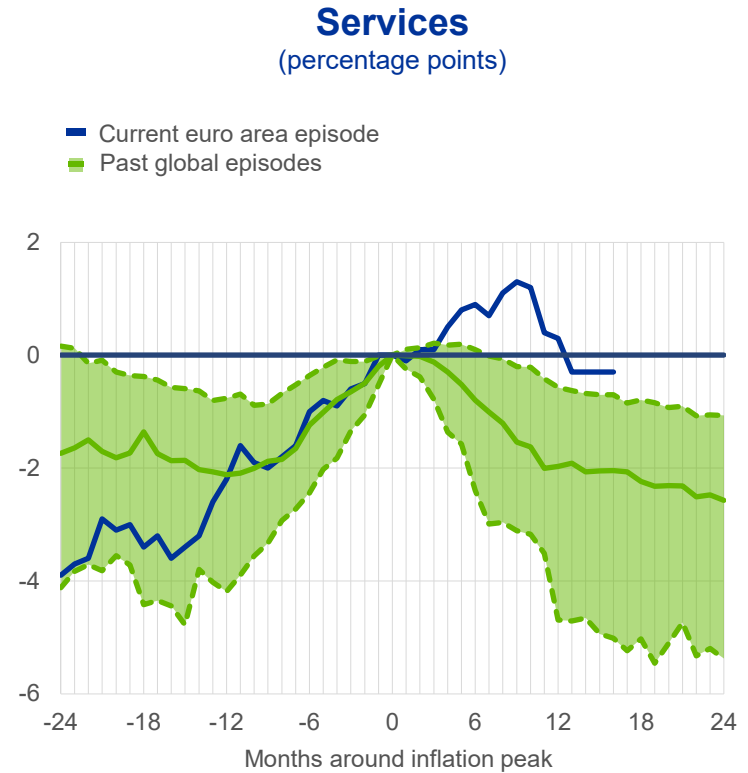
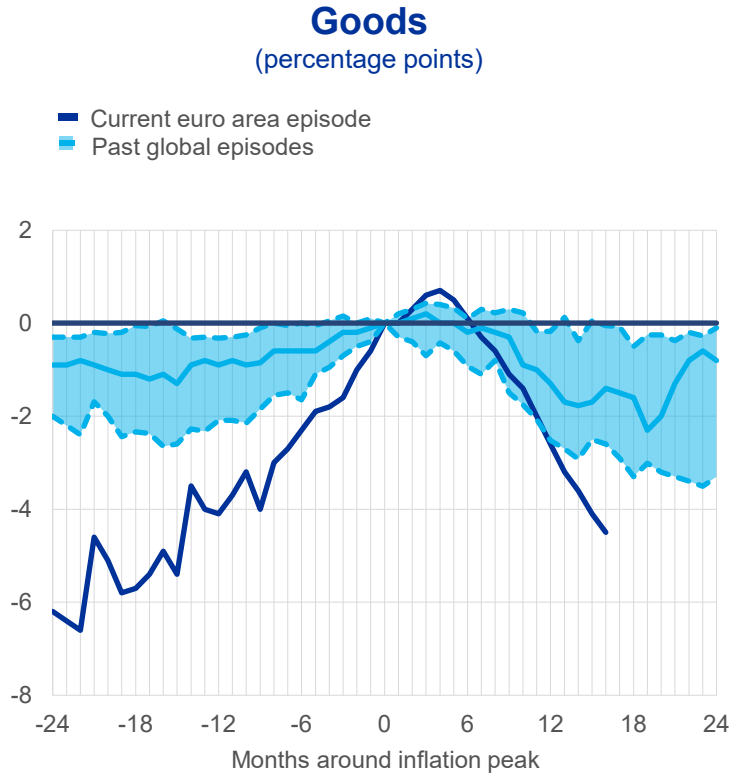
Core (percentage points)



Sources: BIS, Eurostat and ECB calculations.

Notes: The shaded areas and the orange and yellow lines represent, respectively, the interquartile range and the median of national headline and core inflation series relative to their peaks during disinflation episodes before 2022 across a panel of 30 advanced economies (AEs) and 28 emerging market economies (EMEs). Month = 0 is when the headline inflation value was at its highest during that particular episode. The dark blue line represents the latest developments in headline and core inflation for the euro area, relative to the October 2022 peak. Latest observations: February 2024.

Historical comparison of inflation episodes in the euro area - goods and services



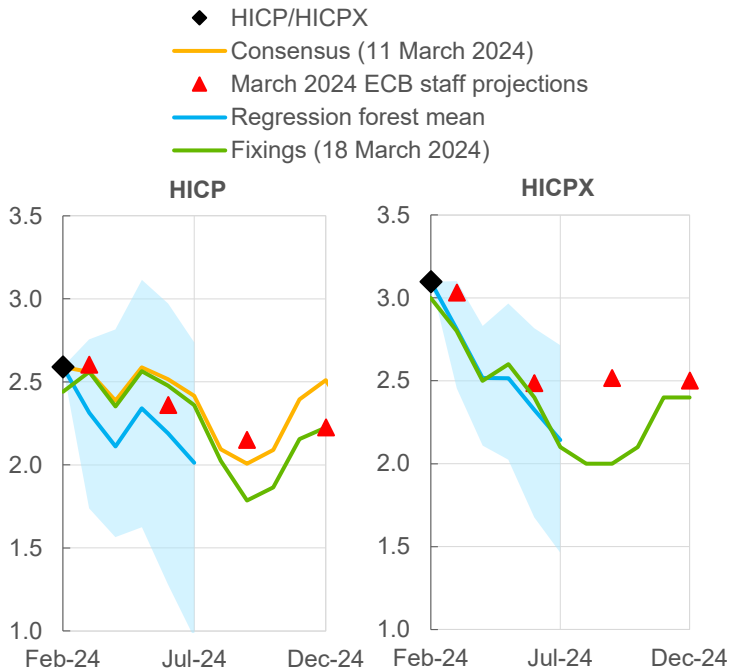
Sources: Bank for International Settlements (BIS), Eurostat and ECB calculations.

Notes: The shaded areas and the blue and green lines represent, respectively, the interquartile range and the median of national non-energy industrial goods and services inflation series relative to their peaks during disinflation episodes before 2022. Non-energy industrial goods inflation refers to a panel of all euro area countries, while services inflation refers to a panel of 30 AEs and 28 EMEs. Month = 0 is when the headline inflation value is at the highest during that particular episode. The dark blue line represents the latest developments in non-energy industrial goods and services inflation for the euro area, relative to the October 2022 peak. Latest observations: February 2024.

Short-term forecasts and measures of underlying inflation

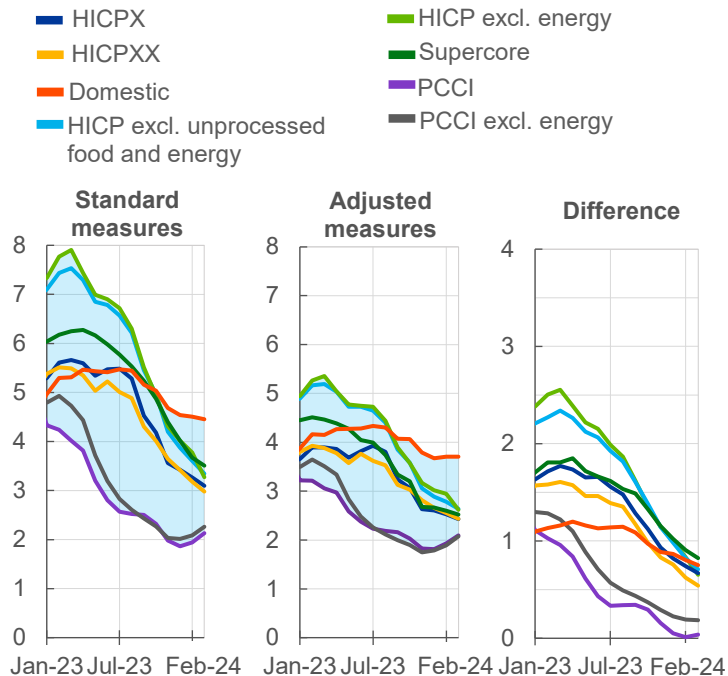
Short-term forecasts for HICP and HICPX

(annual percentage changes)



Measures of underlying inflation

(annual percentage changes)



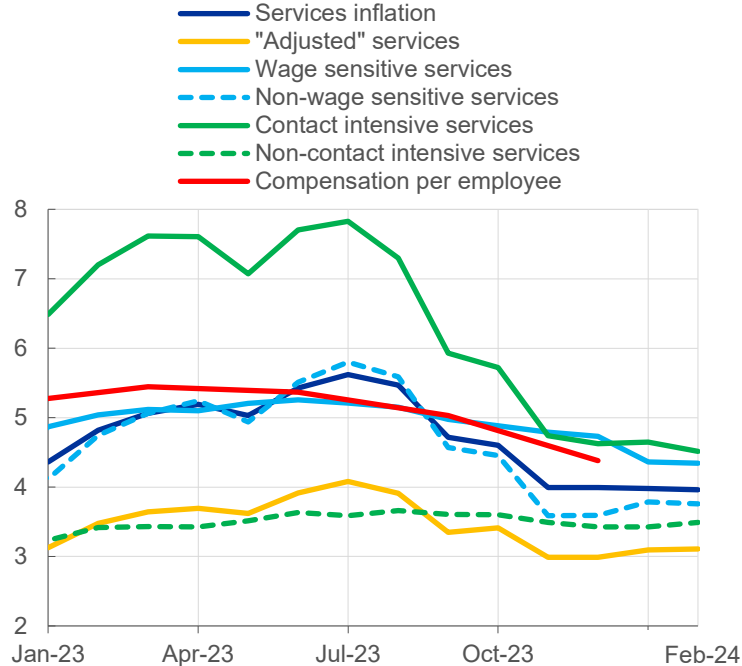
Sources: Eurostat, March 2024 ECB staff short-term inflation outlook, Consensus Economics, Bloomberg and ECB calculations. Notes: The cut-off date for the regression forest and for fixings is 18 March 2024. Consensus Economics data were collected on 11 March. The quantile regression forest estimates are from Lenza, Moutachaker and Paredes (2023). The HICP fixings are observed market prices, whereas the HICPX fixings are estimated based on the model in Grønlund, Jørgensen and Schupp (2024). Latest actual observation: February 2024.

Sources: Eurostat and ECB calculations. Notes: PCCI refers to the Persistent and Common Component of Inflation. The “adjusted” measures abstract from energy and supply-bottleneck shocks using a large SVAR, see Bańbura, Bobeica and Martínez-Hernández (2023), “What drives core inflation? The role of supply shocks”, *Working Paper Series*, No 2875, ECB. Latest observations: February 2024.

Services price pressures

Drivers of services inflation

(annual percentage changes)

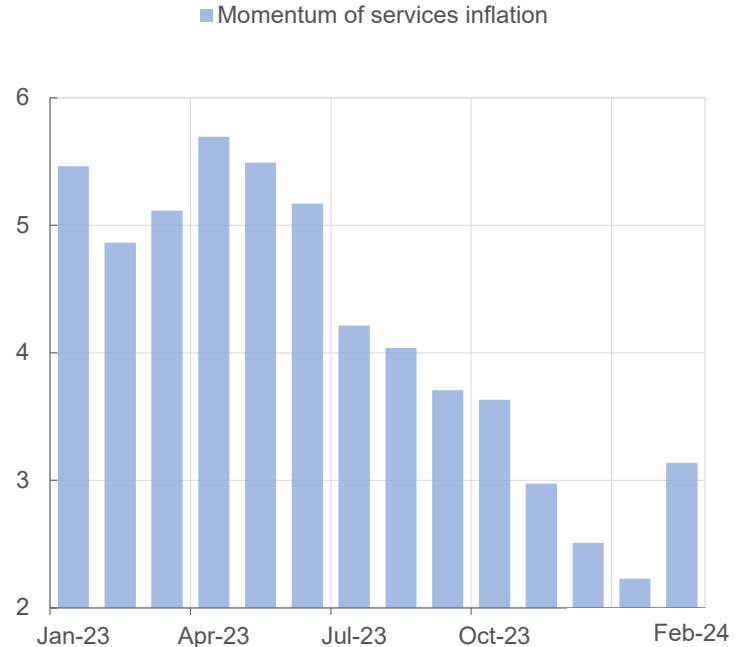


Sources: Eurostat and ECB calculations.

Notes: "Adjusted" services refers to services inflation adjusted for energy and supply bottleneck shocks. Compensation per employee is for the services sector. Latest observations: Q4 2023 for compensation per employee and February 2024.

Momentum of services inflation

(annualised 3 month-on-3 month percentage changes)



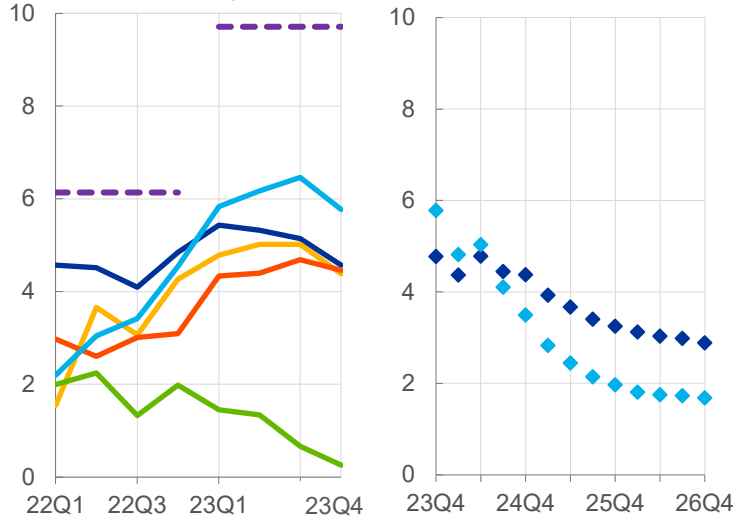
Sources: Eurostat and ECB calculations.

Notes: Calculated using seasonally adjusted data. Latest observation: February 2024.

Labour cost indicators and projections

(annual percentage changes and percentage point contributions)

- Compensation per employee
- Compensation per hour
- Negotiated wages
- Unit labour costs
- Wage drift
- - - Minimum wages
- ◆ Compensation per employee March 2024 ECB staff projections
- ◆ Unit labour costs March 2024 ECB staff projections

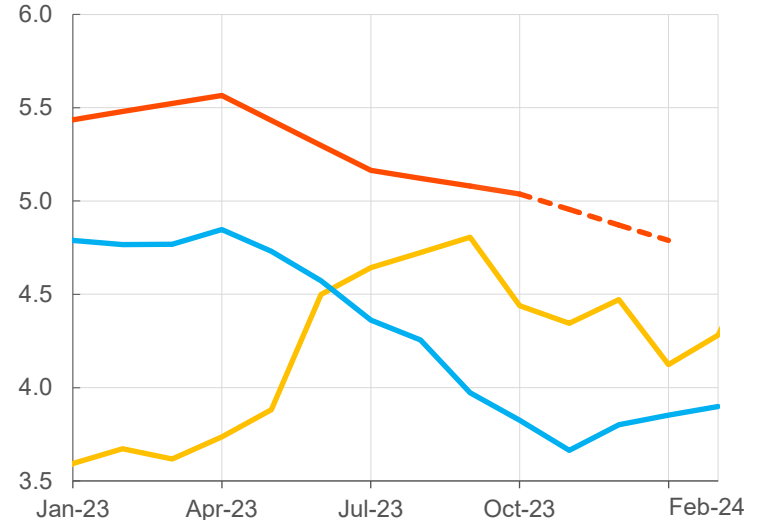


Sources: Eurostat, ECB, ECB calculations and March 2024 ECB staff projections.
 Notes: Minimum wage growth is for the euro area excluding Italy, Austria and Finland.
 Latest observations: Q4 2023.

Wage trackers

(annual percentage changes)

- Wage tracker incl. one-offs
- Wage tracker - average of latest agreements incl. one-offs
- Indeed wage tracker

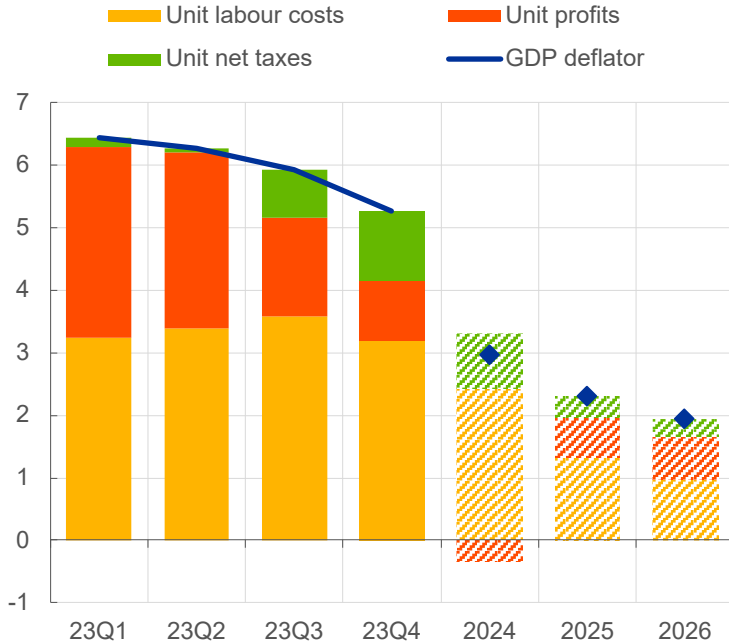


Sources: Calculated based on micro data on wage agreements provided by the Deutsche Bundesbank, Banco de España, Dutch employers' association (AWVN), Oesterreichische Nationalbank, Bank of Greece, Banca d'Italia and Banque de France. Notes: Euro area aggregate based on DE, FR, IT, ES, NL, AT and GR as of February 2024. The indicator of latest agreements reflects wage growth in the agreements reached in a certain quarter for the 12 months after an agreement. One-off payments are spread over 12 months from the agreed disbursement date – smoothing the impact of one-off payments on wage growth. Data on the latest agreements for February 2024 and Q1 2024 are preliminary as not all collective agreements reached in Q1 2024 are available yet. Latest observations: February 2024 for the ECB wage tracker including one-offs and Indeed wage tracker, January 2024 for the rest.

Domestic cost and price pressures

GDP deflator – unit profit perspective

(annual percentage changes and percentage point contributions)

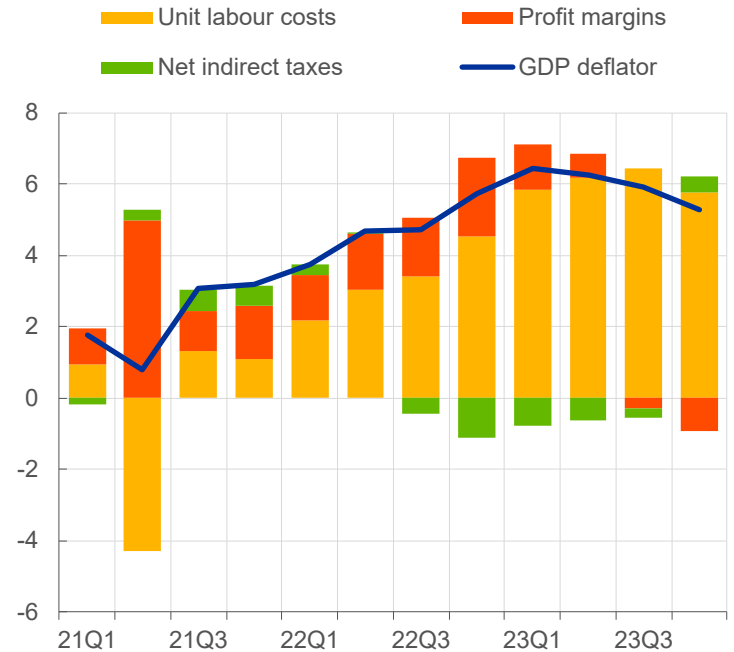


Sources: Eurostat and ECB calculations.

Notes: Unit taxes reflect taxes minus subsidies. When the contribution of subsidies on products is larger than the contribution of indirect taxes, the unit tax contribution turns negative. Shaded areas refer to the March 2024 ECB staff projections. Latest observation: Q4 2023.

GDP deflator – profit margin perspective

(annual percentage changes)



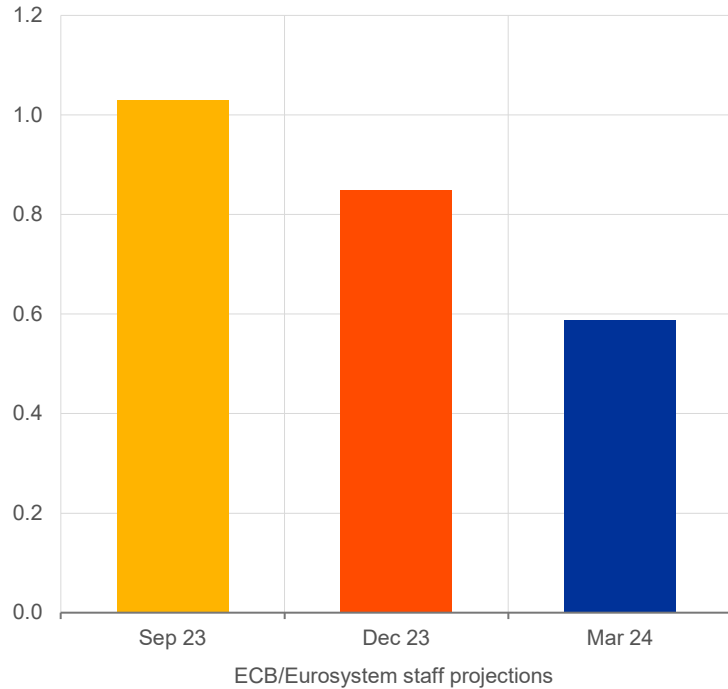
Sources: Eurostat and ECB calculations.

Notes: Profit margins are defined as the ratio between the GDP deflator at factor cost and unit labour costs. Latest observation: Q4 2023.

Evolution of Eurosystem and ECB staff projections for 2024

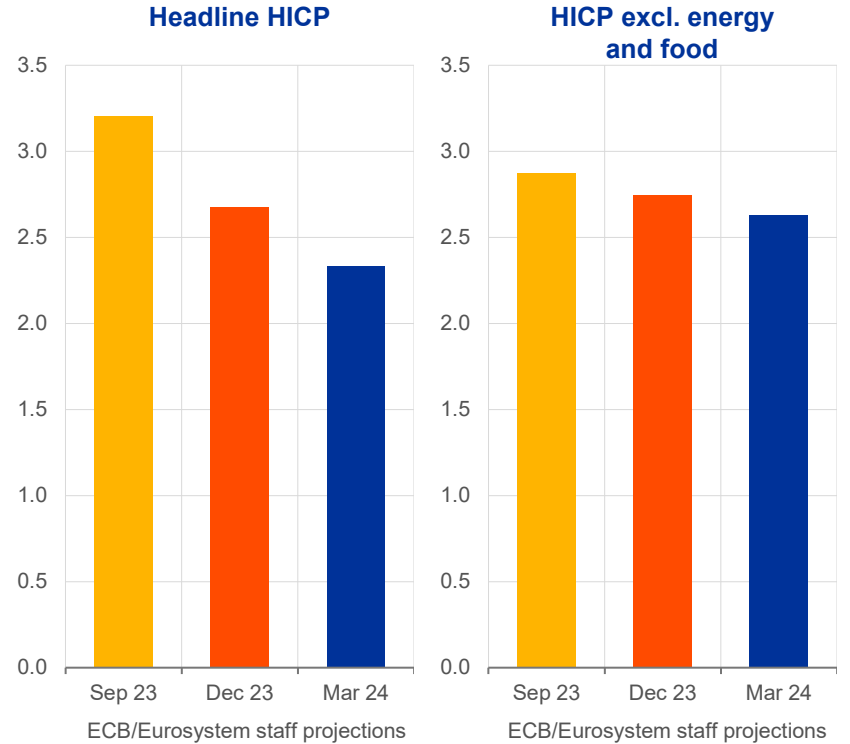
Real GDP growth in 2024

(annual percentage changes)



Inflation in 2024

(annual percentage changes)

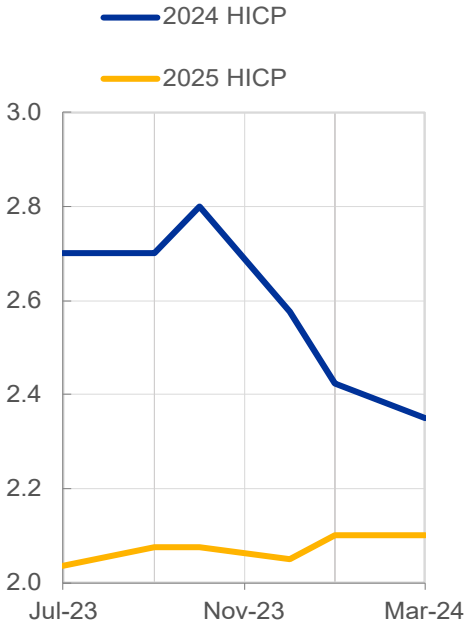


Source: ECB and Eurosystem staff projections.

Inflation expectations

SMA inflation expectations for 2024 and 2025

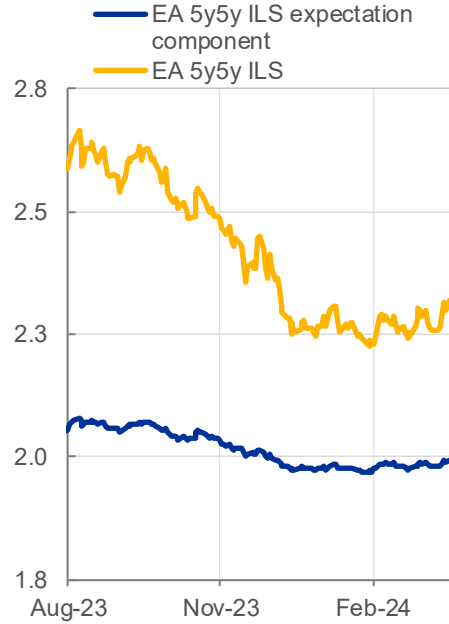
(annual percentage changes)



Source: SMA.
Note: The chart displays the evolution of SMA expectations for 2024 and 2025 over survey rounds.

Decomposition of 5-year on-5-year inflation-linked swap (ILS) rate

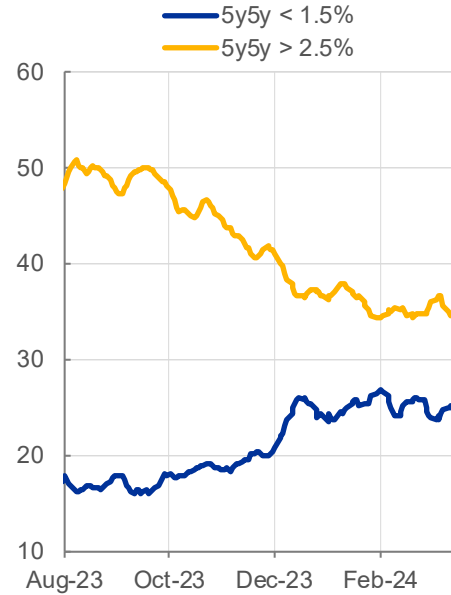
(annual percentage changes)



Sources: Bloomberg and ECB calculations. Notes: Premia-adjusted forward ILS rates are average estimates from two affine term structure models as in Joslin, Singleton and Zhu (2011) applied to ILS rates non-adjusted for the indexing lag; see Burban et al. (2022), *Economic Bulletin*, Issue 8 (2021) Box 4, ECB. Inflation compensation rates refer to a linear interpolation between fixings and forward ILS rates.¹¹ Latest observation: 18 March 2024.

Option-implied probabilities of inflation outcomes

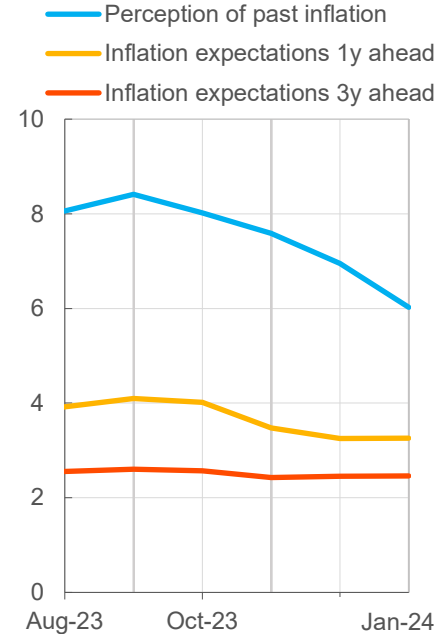
(percent)



Sources: Refinitiv, Bloomberg and ECB calculations. Notes: 5-days moving average risk-neutral probabilities of inflation implied by five-year and ten-year zero-coupon inflation options. The depicted probabilities are risk-neutral probabilities affected by risk premia and should therefore not be interpreted as "real world" (or physical) probabilities. Latest observation: 18 March 2024.

ECB Consumer Expectations Survey

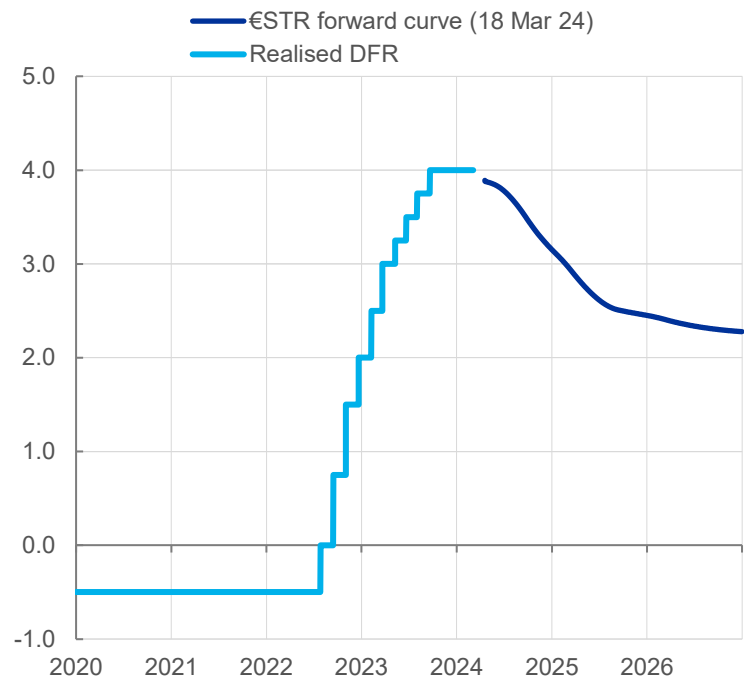
(annual percentage changes)



Sources: Eurostat and ECB Consumer Expectations Survey (CES). Latest observation: January 2024.

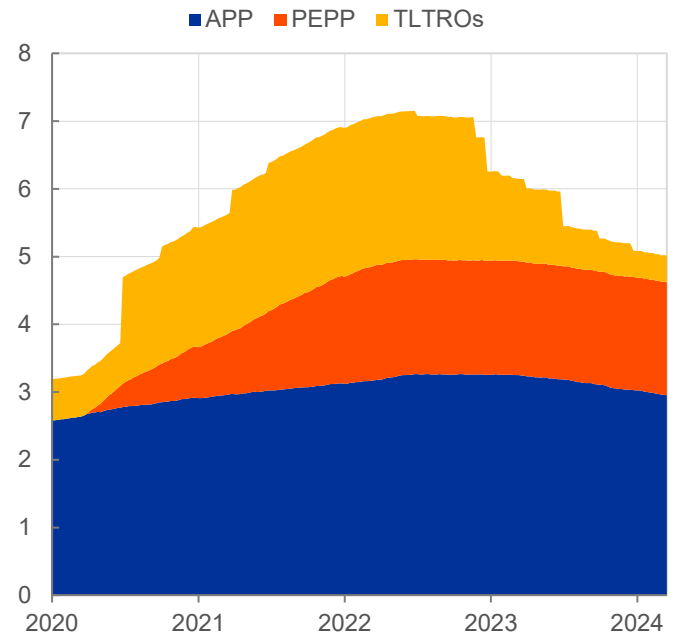
Forward curve and balance sheet

€STR forward curve and DFR (percentages per annum)



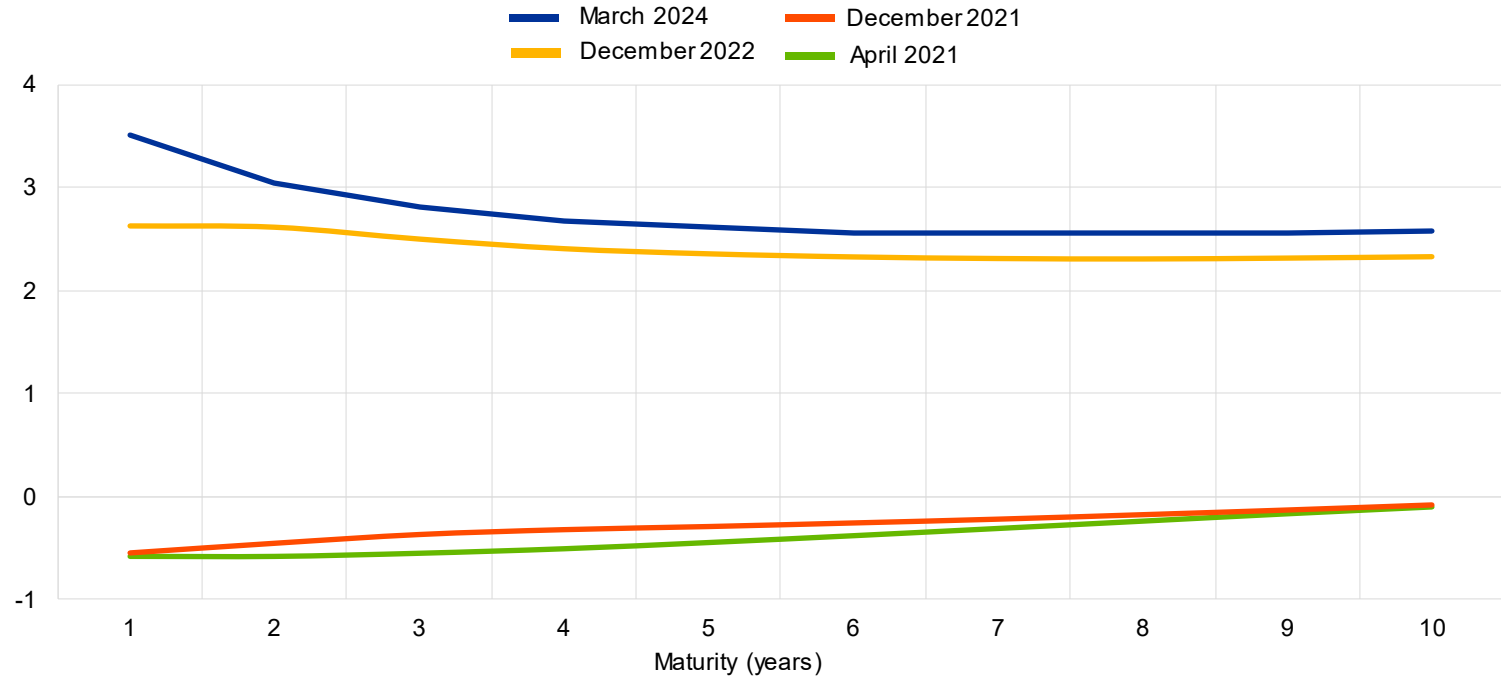
Sources: Bloomberg and ECB calculations.
 Latest observation: 18 March 2024.

APP, PEPP and TLTROs (trillion euros)



Sources: ECB.
 Notes: Purchase programmes are based on book value at amortised cost.
 Latest observation: 15 March 2024.

Euro area Overnight Index Swap (OIS) yield curve (annual percentages)



Sources: Bloomberg and ECB calculations.

Notes: The curves refer to 21 April 2021, 15 December 2021, 14 December 2022 and 18 March 2024, respectively. The latest observation is for 18 March 2024.

Loan supply indicator (index)



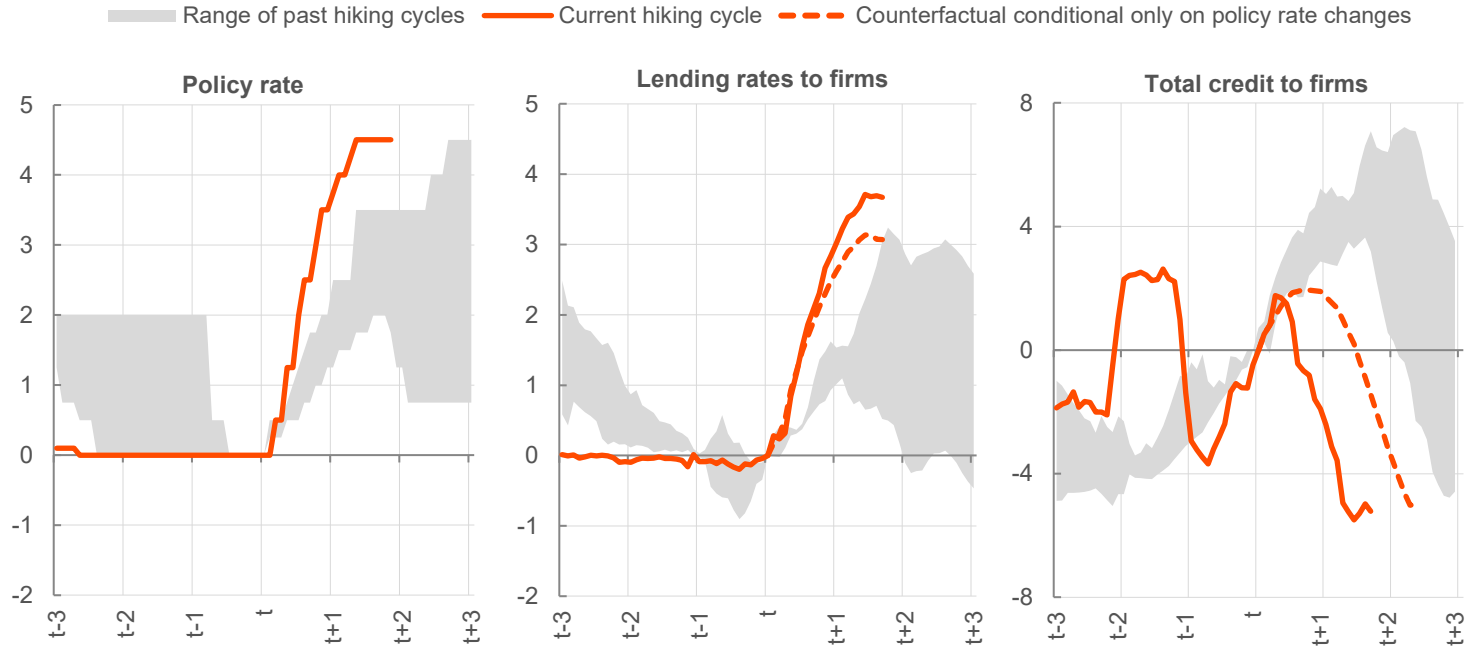
Sources: Bank Lending Survey and ECB calculations.

Notes: Loan supply indicator for bank lending to firms, as in Altavilla, Darracq Parìs and Nicoletti (2019). The series is a moving average. Positive values indicate a tightening, while negative values indicate an easing. The latest observation is for Q4 2023.

Strength of monetary policy transmission

Monetary policy transmission across hiking cycles

(horizontal axis: years; vertical axis: cumulative changes in p.p. for rates, credit growth in deviation from the start of the cycle (t) in p.p. for total credit to firms)

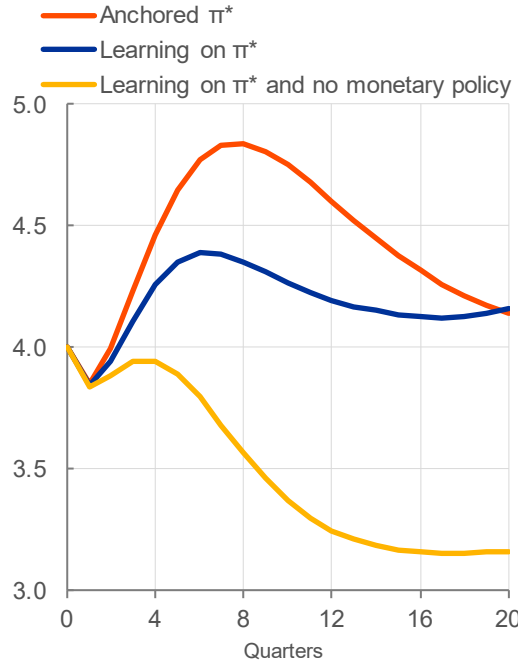


Sources: ECB (BSI, CSEC, MIR) and ECB calculations.

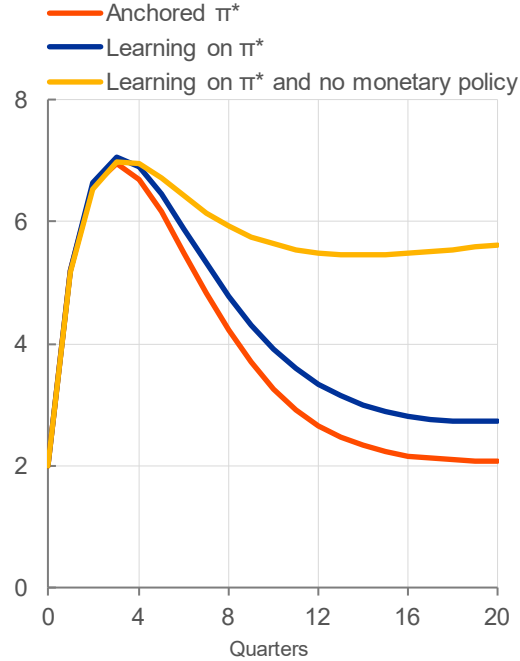
Notes: The relevant ECB policy rate is the Lombard rate of the Bundesbank up to December 1998, the ECB MRO up to May 2014 and the ECB DFR thereafter. Total credit are loans and debt securities. MFI loans are adjusted for sales and securitisation and cash pooling. Starting months correspond to the month immediately preceding the first hike or explicit announcement of the hike of the cycle. Hiking cycles considered starting in: June 1988, October 1999, November 2005 and May 2022. The dotted lines shows counterfactuals for lending rates and lending volumes, taking December 2021 as the last observation and projecting volumes conditional on the path of monetary policy rates. The exercise for lending rates is based on pass-through equations. The one for lending volumes is based on the BVAR model in Altavilla, Giannone, and Lenza (2016). Latest observations: January 2024 for lending rates and total credit to firms, March 2024 for the policy rate.

Role of sound monetary policy framework

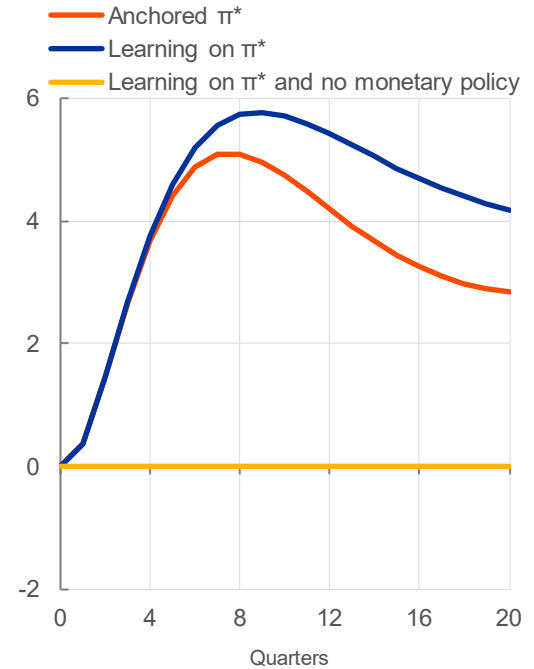
Unemployment (per cent)



Core inflation (per cent)



Policy rate (per cent)

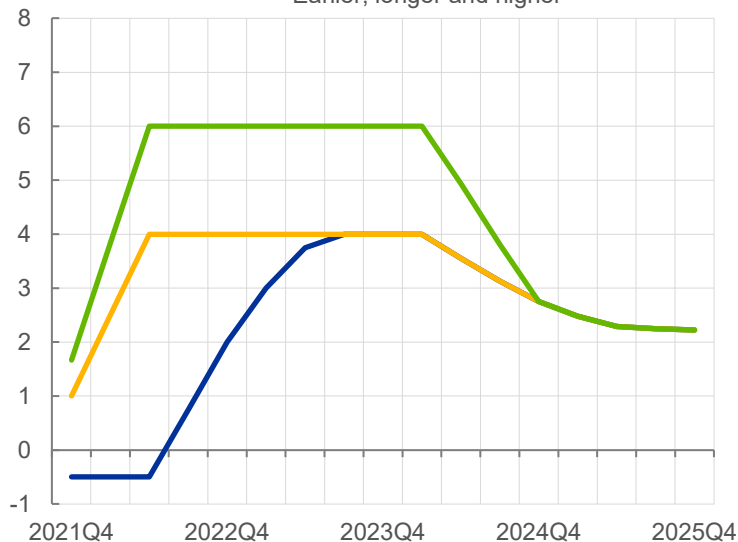


Source: Amatyakul P, F De Fiore, M Lombardi, B Mojon and D Rees (2023): "The contribution of monetary policy to disinflation", BIS Bulletins, no 82, December.
Note: Simulations based on the semi-structural model Hofmann, B, M Lombardi, B Mojon and A Orphanides (2021): "Fiscal and monetary policy interactions in a low interest rate world", BIS Working Papers, no 954, July.

Interest rate under alternative counterfactuals

(percentages per annum)

- Baseline
- Earlier and longer
- Earlier, longer and higher



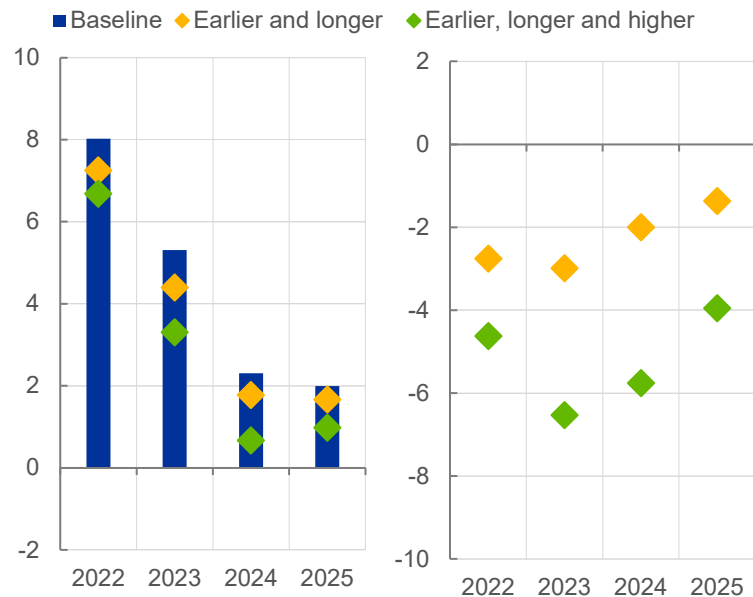
Counterfactual impacts on

Inflation

(annual percentage change)

Output gap

(p.p. deviation from output gap)



Sources: ECB calculations based on the New Area-Wide Model II (Coenen, Karadi, Schmidt, Warne, 2019), the MMR model (Mazelis, Motto, Ristinieni, 2023), and the ECB-BASE model (Angelini, Bokan, Christoffel, Ciccarelli, Zimic, 2019). Notes: The LHS chart displays the actual and BMPE baseline path for the interest rate (blue) and hypothetical alternative paths: an earlier start to normalisation in 2021Q4 whereby the interest rate reaches the peak level of the baseline earlier and is equal to the baseline thereafter (yellow); early normalisation with a higher peak level that is reached already in 2022Q2 and kept there until 2024Q1 and then returns to the baseline (green). The RHS chart displays the impact on inflation (first panel) and output gap (second panel) for each of the hypothetical alternative paths of the interest rate. As a caveat, financial feedback loops as well as feedback loops between inflation expectations and inflation are not activated.

Latest observation: 9 Feb 2024 for the baseline (final cut-off of Mar 2024 MPE financial assumptions).