Inflation diagnostics and monetary policy

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Chart 1

HICP inflation and the HICP price level
(Left: annual percentage changes, right: index: Dec-1998 = 100)

Source: Eurostat
Notes: The right panel is based on seasonally adjusted data.
The latest observations are for November 2022 (flash).
Price developments relative to HICP for different subcomponents
(left: index: 1998 Q4 =100, right: index: December 2019 = 100)

Source: Eurostat
Notes: Seasonally adjusted data for HICP, food, goods and services. Seasonally adjusted series for energy are not available. The goods category here only includes non-energy industrial goods (NEIG). The latest observations are for November 2022 (flash).
Chart 3

Cumulative prices changes at inflation-category level since December 2019

(percentage changes)

Sources: Eurostat and ECB staff calculations.
Notes: The chart shows the inflation rates of items in HICPX. Energy sensitive items are those with an above average share of energy costs in total costs (direct and indirect). These items account for 25% of overall HICPX. The latest observations are for October 2022.
Goods inflation — decomposition into energy sensitive items

(annual percentage change and percentage point contributions)

Sources: Eurostat and ECB staff calculations.
Notes: Goods here only includes non-energy industrial goods (NEIG). Energy sensitive component based on items with a share of energy in total (direct and indirect) costs above the average energy share across all NEIG items.
The latest observations are for November 2022 (flash) for goods and October 2022 for the rest.
Chart 5

Services inflation — decomposition into energy sensitive items

(annual percentage change and percentage point contributions)

Sources: Eurostat and ECB staff calculations.
Notes: Energy sensitive component based on items with a share of energy in total (direct and indirect) costs above the average energy share across all services items.
The latest observations are for November 2022 (flash) for services and October 2022 for the rest.
Chart 6

Terms of trade and price level deflators relative to GDP
(ratio)

Sources: ECB, Eurostat and ECB staff calculations.
Notes: The terms of trade are expressed as the ratio between export and import deflators.
The latest observations are for September 2022.
Chart 7

Income effects of euro area terms of trade from Q4 2019 to Q2 (ratio)

Sources: ECB, Eurostat and ECB staff calculations.
Notes: The income effect of terms of trade is calculated by weighing export and import price changes by their respective value in the fourth quarter of 2019 and considered as a percentage share of GDP in the fourth quarter of 2019. The weights are computed based on extra-euro area trade flows and prices as obtained from the Eurostat national accounts. Due to data availability, Slovenia and Spain are not included in the euro area aggregate.
Oxford stringency index: realised and compared to May 2020 expectations

(max stringency = 100)

Sources: Oxford university, ECB calculations.

Chart 9

Supply bottlenecks indicators
(left: standard deviations; right: diffusion index in deviation from trend)


Latest observations: left: October 2022; right: November 2022.
Chart 10

Real GDP and consumption: OECD, US and euro area

(index: 2019Q4 = 100)

Sources: Eurostat, OECD and ECB staff calculations.
The latest observations are for September 2022 for US durable and non-durable goods, Q3 2022 for EA GDP, Q2 2022 for the other series.
Oil price decomposition: supply, demand and risk factors

(Daily cumulated percentage change since 31/12/2019)

Sources: Refinitiv and ECB staff calculations.
Notes: Structural shocks are estimated using the spot price, futures to spot spread, markets expectations on oil price volatility and a stock price index. The latest observations are for 29 November 2022.
Gas: prices and supply
(left panel: EUR per MWh, right panel: million cubic meters per day)

Sources: Refinitiv, Bloomberg and ECB staff calculations.
Notes: Ytd stands for year to date. Quarterly gas flows are computed by taking the average over all daily flows in a given quarter. Liquefied natural gas (LNG) supply includes flows from Russia.
The latest observations are for 29 November 2022.
Goods inflation — decomposition into supply and demand-driven contributions

*(annual percentage change and percentage point contributions)*

Sources: Eurostat and ECB staff calculations.
Notes: Goods inflation here only includes non-energy industrial goods (NEIG). Seasonally adjusted data. Based on Shapiro, A.H. (2022). Goods inflation is the sum of demand-driven, supply-driven and ambiguous components, calculated as the trailing sum of the last 12 monthly contributions. While price data are available for October 2022, the latest observation is for August 2022 as the turnover series used as a proxy for activity are published with some delay.
Chart 14

Services inflation — decomposition into supply and demand-driven contributions
(annual percentage change and percentage point contributions)

Sources: Eurostat and ECB staff calculations.
Notes: Seasonally adjusted data. Based on Shapiro, A.H. (2022). Services inflation is the sum of demand-driven, supply-driven and ambiguous components, calculated as the trailing sum of the last 12 monthly contributions. While price data are available for October 2022, the latest observation is for August 2022 as the turnover series used as a proxy for activity are published with some delay.
Services inflation — decomposition into contact intensive and energy sensitive items

(annual percentage change and percentage point contributions)

Sources: Eurostat and ECB staff calculations.
Note: Energy sensitive component based on items with a share of energy in total (direct and indirect) costs above the average energy share across all services items. The latest observations are for November 2022 (flash) for services and October 2022 for the rest.
Chart 16

Headline inflation, measures of underlying inflation, and inflation projections and expectations
(annual percentage changes)

Sources: Eurostat and ECB calculations.
The latest observations are for November 2022 (flash) for HICP, October 2022 for the range of measures of underlying inflation. The latest observations for market-based indicators of inflation compensation are for 14 November 2022. The SPF data shows expected annual percentage changes for the year 2022, 2023 and 2024. The Survey of Monetary Analysts and the September 2022 ECB staff projections show quarterly forecasts. The cut-off date for data included in the ECB staff macroeconomic projections was 25 August 2022.
Chart 17

Mean of underlying inflation measures and end-of-horizon inflation projection
(annual percentage changes)

Sources: Eurostat and ECB staff calculations.
The latest observations are for 2022Q3.
Nominal and real wage growth (consumer wages)

(index: Q4 2020 = 100)

Sources: Eurostat and ECB staff calculations.
Notes: Real compensation per employee and per hour are calculated using HICP (consumer wages).
The latest observations are for the second quarter of 2022.
Negotiated wage growth and nominal wage growth in job postings

(annual percentage changes)

Sources: ECB, Indeed and ECB calculations.
Notes: Data on nominal wage growth in job postings (Indeed – 3 months MA) is presented at monthly frequency and covers six euro area countries (DE, ES, FR, IE, IT and NL) and is based on “Wage growth in euro area countries: evidence from job ads” – P. Adrjan & R. Lydon, Economic Letter, Central Bank of Ireland, Vol 2022, No. 7. Indeed data are shown at monthly, negotiated wages at quarterly frequency.
The latest observations are for 2022 Q3 for negotiated wages, and October 2022 for Indeed data (reflecting data up to mid-October).
Experimental forward-looking tracker of negotiated wage growth in the euro area  
(annual percentage changes)

Sources: Bundesbank, Banco de España, the Dutch employer association AWVN, Banca d'Italia, Banque de France, Bank of Greece, Oesterreichische Nationalbank and ECB calculations.

Notes: The euro area aggregate is based on data from Germany, France, Italy, Spain, the Netherlands, Austria and Greece. Weighted average of agreements signed in 2022 is without FR for 2023.

The latest observations are for October 2022 for DE, ES, NL and September 2022 for IT, AT, GR, FR.
Euro area Beveridge curve

(x-axis: unemployment rate; y-axis: job vacancy rate)

Sources: Eurostat, and ECB staff calculations based on data from Institute for Employment Research (Institut für Arbeitsmarkt- und Berufsforschung - IAB), Ministère du Travail, de l’Emploi et de l’Insertion, Istituto Nazionale Previdenza Sociale (INPS), and Ministerio de Inclusión, Seguridad Social y Migraciones.

Note: JRS stands for job retention schemes.
Latest observations are for 2022 Q3 for the unemployment rate and vacancy rate and 2022 Q3 for the JRS, based on August 2022 for Germany, June 2022 for France, September 2022 for Spain and April 2022 for Italy.
Survey of Professional forecasters: time series of mean long-term inflation expectations
(annual percentage changes)

Sources: ECB Survey of Professional Forecasters (SPF).
Note: Long-term inflation expectations refers to expectations five calendar years ahead in Q3 and Q4 rounds and four calendar years ahead in Q1 and Q2 rounds. For example, longer-term expectations refer to 2027 in the third and fourth quarter of 2022 rounds and to 2026 in the first and second quarter of 2022 rounds. Last observation: 2022Q4 round conducted in October 2022.
Survey of Professional forecasters: distribution of longer-term expectations
(percentage of respondents)

Sources: ECB Survey of Professional Forecasters (SPF).
Notes: The SPF asks respondents to report their point forecasts and to separately assign probabilities to different ranges of outcomes. This chart shows the spread of point forecast responses. Longer-term expectations refer to calendar year five years ahead in the third and fourth quarter rounds (and four calendar years ahead in the first and second quarter rounds).
Survey of Monetary Analysts: inflation expectations over survey rounds for 2022, 2023 and 2024

(annual percentage changes)

Source: ECB Survey of Monetary Analysts (SMA).
Note: Chart includes survey vintages from June 2021 until October 2022 as SMA data is only published as of June 2021.
Survey of Monetary Analysts: long-term inflation expectations over survey rounds  
*(percentage changes)*

Source: ECB Survey of Monetary Analysts (SMA).

Note: Chart includes survey vintages from June 2021 until October 2022.
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Survey of Monetary Analysts: distribution of long-term inflation expectations in October 2022 survey (percentages)

Source: October 2022 ECB Survey of Monetary Analysts (SMA).
Chart 27

Inflation linked swap (ILS) rates

(annual percentage points)

Sources: Refinitiv and ECB calculations.
The latest observations are for 29 November 2022.
Chart 28

Decomposition of the 1y4y inflation linked swap (ILS) rate

(Annual percentage points)

Sources: Refinitiv and ECB calculations.
Note: Average estimates based on two affine term structure models following Joslin, Singleton and Zhu (2011) applied to ILS rates adjusted for the indexation lag, as in Camba-Mendez and Werner (2017).
The latest observations are for 29 November 2022.
Inflation rates implied by market-based measures of inflation compensation and surveys
(Annual percentage points)

Sources: Bloomberg, Refinitiv, ECB Survey of Monetary Analysts (SMA) 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 indexation lag; see Burban, V. et al. (2022), ECB Economic Bulletin Issue 8, 2021, Box 4. The latest observations are 29 November 2022.
Median consumer inflation expectations over time

(annual percentage changes)

Sources: ECB Consumer Expectations Survey (CES) and Eurostat.
The latest observations are for November (flash) for HICP inflation and September 2022 wave for CES expectations.
Distribution of consumer inflation expectations 3-year ahead
(annual percentage changes)

Sources: ECB Consumer Expectations Survey.
Pass-through of changes in market rates to lending and debt securities rates over time

(x-axis: time horizon; y-axis: percentages)

Sources: ECB (MIR, BSI), IHS Markit iBoxx and ECB calculations.
Notes: Estimates of lending rates pass-through are from Altavilla, C., F. Canova and Ciccarelli M., Mending the broken link: Heterogeneous bank lending rates and monetary policy pass-through, Journal of Monetary Economics 2020, Volume 110, 2020, Pages 81-98.
Chart 33

Ratio between bonds and loans for firms in the euro area versus United States
(ratio of outstanding amounts)

Sources: ECB and Federal Reserve Board.
Latest observation: 2022 Q2.
Household debt: Euro area versus United States

(percentage over GDP)

Sources: ECB, Federal Reserve Board and Bureau of Economic Analysis.
Latest observation: 2022 Q2.
€STR forward curve and survey expectations on the deposit facility rate
(percentages per annum)

Sources: Bloomberg, Refinitiv, and ECB calculations.
Notes: The dots depict the median of responses to the SMA on most likely future deposit facility rates. Surveys are adjusted for the euro short-term rate (€STR) vs. deposit facility rate (DFR) spread.
Latest observation: 29 November 2022 for realised €STR.
Chart 36

OIS yield curves
(percentages per annum)

Sources: Refinitiv, ECB calculations.
Latest observation: 29 November 2022.
Term structure of real forward rates
(percentages per annum)

Sources: Refinitiv and ECB calculations.
Notes: Real forward rates are calculated by subtracting the inflation-linked swap forward rates from the nominal OIS forward rates for each maturity.
Latest observation: 29 November 2022.
10-year sovereign yield spreads over OIS rates
(percentages per annum)

Sources: Refinitiv and ECB calculations.
Notes: The spread is the difference between individual countries’ 10-year sovereign yields and the 10-year OIS rate.
Latest observation: 29 November 2022.
Sources: iBoxx, Refinitiv, and ECB calculations
Notes: The spreads are based on indices including companies that issue bonds in EUR, without strict restriction to their domicile and are calculated as weighted averages of bond spreads over Markit iBoxx swap curve (EA). The dashed lines show the long-term average between Jan 2015 and Nov 2021.
Latest observation: 29 November 2022.
Estimated semi-elasticities of house prices and housing investment to a 1 percentage point increase in the mortgage rate  
(percentages)

Sources: Eurostat, ECB and ECB staff calculations based on Battistini, Gareis and Roma (2022).
Notes: The charts show “smoothed” estimated semi-elasticities of house prices and housing investment to a 1 percentage point increase in the mortgage rate, using linear local projections. The projections include real GDP, the HICP, a short-term interest rate and housing loans as control variables and are estimated for the period running from the first quarter of 1995 to the last quarter of 2019 (i.e. excluding the period of the COVID-19 crisis). “Smoothed” refers to centred three-period moving averages of the estimated semi-elasticities, excluding the initial and final points. The dashed lines refer to the 90% confidence bands.
Average bank funding costs of euro area banks  
(percentage per annum)

Sources: ECB (MIR, BSI), IHS Markit iBoxx and ECB calculations.
Notes: The composite funding cost is the weighted average of the cost of deposits and market debt funding, with the respective outstanding amounts on bank balance sheets used as weights. Deposit rates are on new business. The latest available data for deposit rates has been used, in order to extend the time interval of consideration up to the latest available date for bank bond yields. Latest observation: September 2022 for BSI and MIR; 29 November 2022 for iBoxx.
Sources: ECB (MIR).
Notes: The indicator for the total cost of borrowing for firms and for households for house purchase is calculated by aggregating short-term and long-term rates using a 24-month moving average of new business volumes.
Latest observation: September 2022.
Credit standards on loans to euro area firms (left panel) and demand for loans to firms (right panel) and contributing factors

(net percentages)

Source: ECB (BLS).

Notes: “Actual” values refer to changes reported by banks over the past three months, while “expected” values are changes anticipated by banks over the next three months. Net percentages for the questions on credit standards are defined as the difference between the sum of the percentages of banks responding “tightened considerably” and “tightened somewhat” and the sum of the percentages of banks responding “eased somewhat” and “eased considerably”. Net percentages for the questions on demand for loans are defined as the difference between the sum of the percentages of banks responding “increased considerably” and “increased somewhat” and the sum of the percentages of banks responding “decreased somewhat” and “decreased considerably”. The net percentages for “other factors” refer to further factors which were mentioned by banks as having contributed to changes in credit standards.

Latest observation: October 2022 BLS.
Credit standards on loans to euro area households for house purchase (left panel) and demand for loans to households for house purchase (right panel) and contributing factors (net percentages)

Source: ECB (BLS).
Notes: “Actual” values refer to changes reported by banks over the past three months, while “expected” values are changes anticipated by banks over the next three months. Net percentages for the questions on credit standards are defined as the difference between the sum of the percentages of banks responding “tightened considerably” and “tightened somewhat” and the sum of the percentages of banks responding “eased somewhat” and “eased considerably”. Net percentages for the questions on demand for loans are defined as the difference between the sum of the percentages of banks responding “increased considerably” and “increased somewhat” and the sum of the percentages of banks responding “decreased somewhat” and “decreased considerably”. The net percentages for “other factors” refer to further factors which were mentioned by banks as having contributed to changes in credit standards.
Latest observation: October 2022 BLS.