EUROPEAN CENTRAL BANK

EUROSYSTEM

The ECB's 2025 Monetary Policy Strategy Assessment

Outcome and analytical background studies

BIS/ECB/SUERF workshop
22 September 2025

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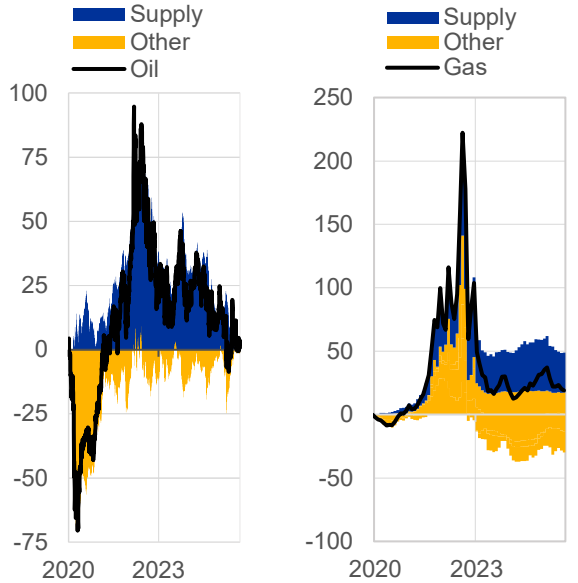
Report of workstream 1: “A strategic view on the economic and inflation environment in the euro area”

ECB Occasional paper No. 371:
https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op371.en.pdf

Shocks affecting euro area inflation since the last strategy review

Oil and gas commodity prices

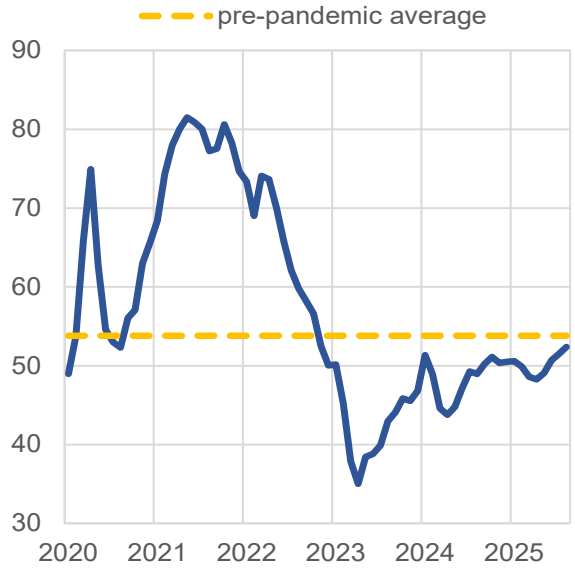
(oil: USD per barrel, gas: EUR per MWh, index Jan-20 = 100)



Sources: lhs: LSEG and ECB staff calculations based on Gazzani et al. (2024) and rhs: LSEG, Bloomberg, IEA and ECB staff calculations based on Adolfsen et al (2024). Notes: lhs: Structural shocks are estimated using the 1m future, 12m to 1m futures spread, markets' expectations on oil price volatility and stock price index, following a BVAR based on Gazzani et al. (2024). Rhs: The decomposition is based on a 4 variables Bayesian VAR where shocks are identified with sign restrictions including a euro area gas quantity proxy (defined as imports+domestic production-exports), gas price, gas inventories and euro area industrial production. The last two observations for gas quantity and industrial production are nowcasted. Latest observations: September 2025 for the lhs and August 2025 for the rhs.

Supply bottlenecks

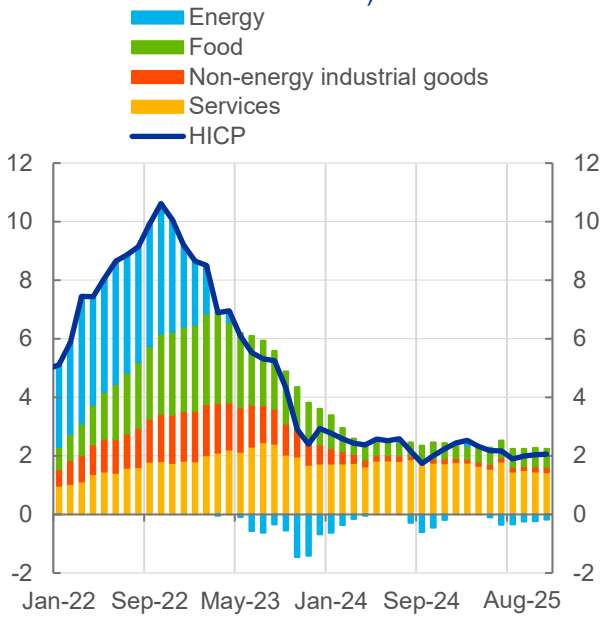
(diffusion index, threshold = 50)



Sources: IHS Markit and ECB staff calculations.
Notes: the chart shows the PMI suppliers' delivery times inverted. Higher values mean longer suppliers' delivery times.
The latest observation is for August 2025.

Contributions to HICP

(annual growth rates and percentage point contributions)

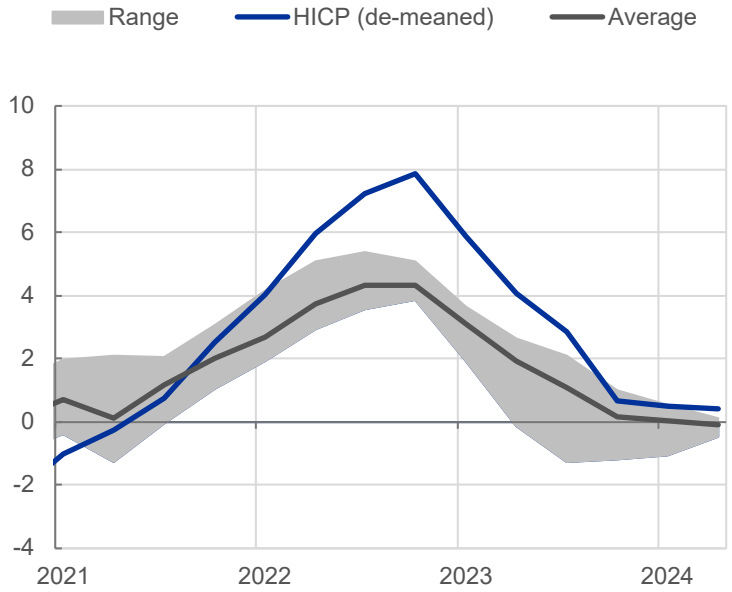


Sources: ECB staff calculations and Eurostat.
Note: The latest observations are for August 2025.

Role of demand and supply factors for inflation developments

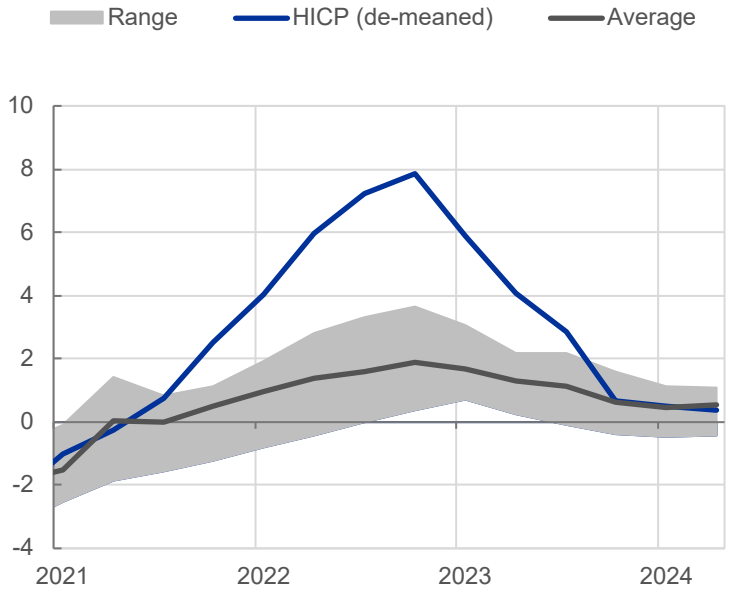
Contribution of supply shocks to euro area headline HICP

(annual growth rates and percentage point contributions)



Contribution of demand shocks to euro area headline HICP

(annual growth rates and percentage point contributions)

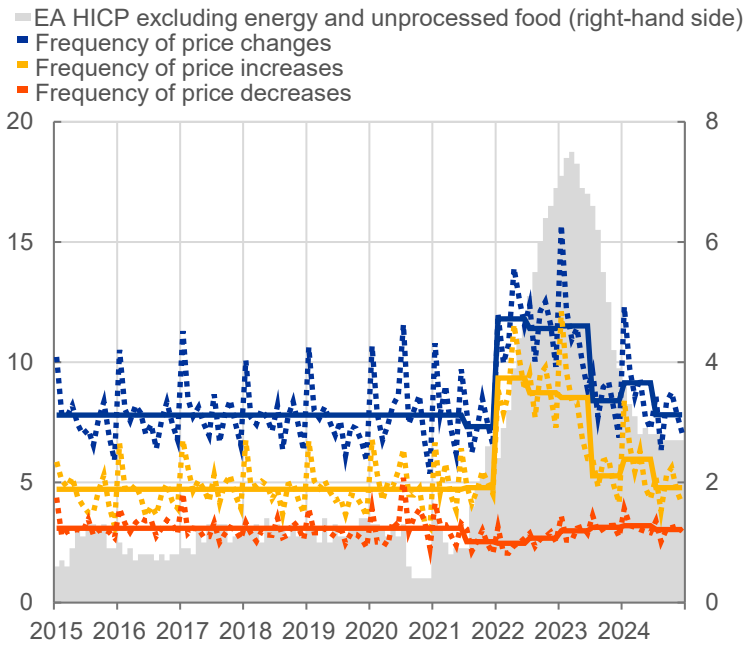


Sources: Eurostat and ECB's staff calculations. Notes: The charts show the ranges of the contributions of supply and demand shocks to euro area annual headline inflation rate estimated using several models: Bayesian VARs as in Bobeica and Jarocinski (2019), augmented with global supply chain shocks and as in Banbura, Bobeica and Martinez Hernandez (2023), a structural factor model of Eickmeier and Hofmann (2022), a structural VAR model of Kataryniuk, Martinez-Martin, Pappa and Rast, (2025) and a large DSGE model, namely the New Area Wide Model II of Coenen, Karadi, Schmidt and Warne (2018). Some models also contain other drivers in addition to supply and demand factors, which are not reflected in the chart. Therefore, the contribution of supply and demand do not always add up to the total. Depending on the model, the contributions are calculated for headline HICP in deviation from historical mean and contribution of other deterministic components or from the steady state of 2%. The latest observations are for the second quarter of 2024.

Evidence of non-linearities

Repricing frequency (all sectors)

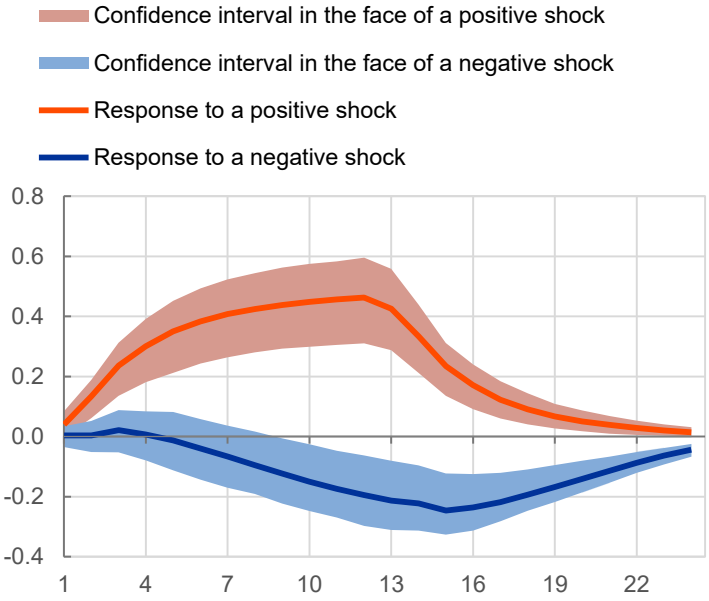
(left-hand side: percentages; right-hand side: annual percentage change)



Sources: Consumer price micro-datasets from the national statistics institutes of Germany, France, Italy, Spain, Austria, Greece, Estonia, Latvia and Lithuania. Data for 2024 include DE (Hessen) until July 2024, FR, IT, ES, AT, EE, LV until Dec 2024, GR until Dec 2023 and LT until March 2023. Calculations: Gautier et al. (2025), "Consumer Price Stickiness in the Euro Area During an Inflation Surge" mimeo. Notes: The chart shows the weighted average frequencies of price changes (excluding sales) for all sectors and by aggregate product category. VAT changes in Germany (2020-21) and Spain (2020-23) have been excluded. VAT changes in Jan 2024 in Germany (restaurant sector) and EE (main rate) are controlled for in a similar way as other VAT changes over the whole sample. The solid lines plot the average over the period 2015-21 and half-year averages over the period 2021-24. The latest observations are for December 2024.

Response of core inflation to energy price increases and decreases

(percentage points)

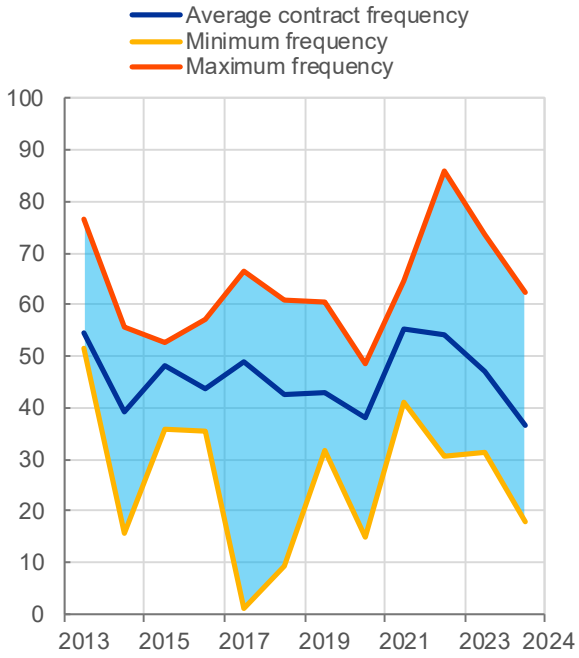


Sources: See Burriel et al., 2024.
Notes: The x-axis shows the time after the shock in months. The y-axis shows the response of year-on-year core inflation in percentage points. The energy price shock increases (decreases) energy price inflation by 6% on impact. Results are based on a bivariate non-linear SVAR which consists of y-o-y energy price inflation and y-o-y core inflation. The energy price shock is identified via contemporaneous restrictions.

Wage setting frequency and cyclicality of employment

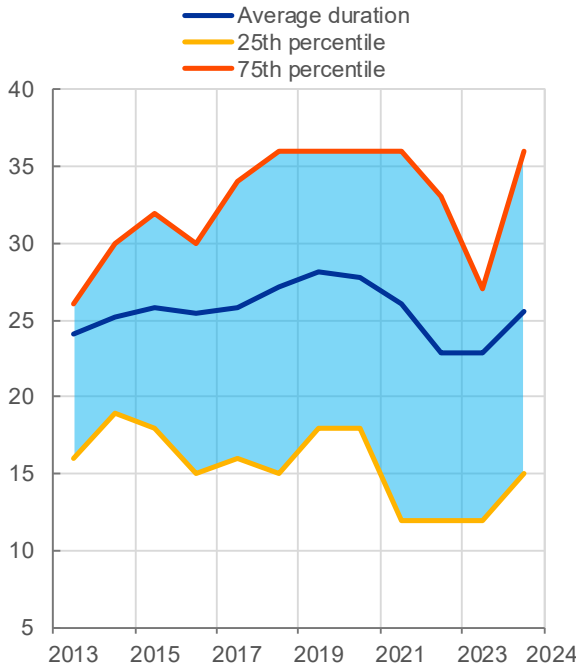
Frequency of wage agreement renegotiation

(percentages)



Average wage agreement duration

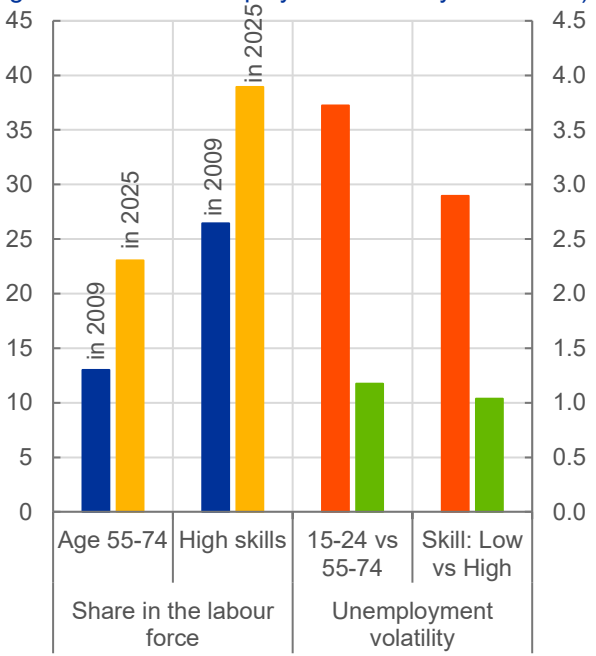
(number of months)



Sources: Wage tracker calculated based on micro data on wage agreements provided by Deutsche Bundesbank, Banco de España, the Dutch employer association (AWVN), Oesterreichische Nationalbank, Bank of Greece, Banca d'Italia, and Banque de France.
Notes: The frequency of contract renegotiation is calculated as the share of wage agreements renegotiated in each year weighted by the number of workers covered. The light blue area shows the minimum-maximum range based on country estimates. The average of contract renegotiation is the weighted average duration of individual wage agreements, and the light blue area shows the range between the 25th and 75th percentile based on individual agreements.

Effects of ageing and upskilling on the cyclicality of unemployment

(left-hand side: share in the labour force in %; right-hand side unemployment volatility coefficient)

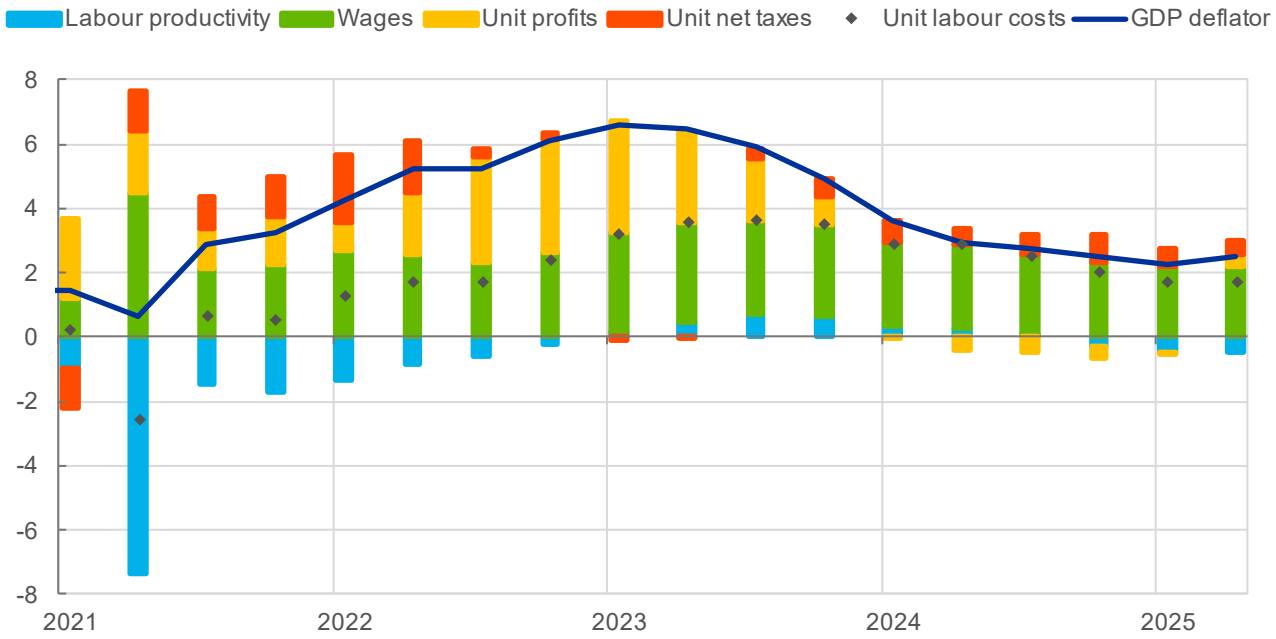


Sources: Eurostat, Eurosystem and ECB calculations.
Notes: Ageing and digitalisation trends are captured by an increase in the cohorts of elderly and high-skilled workers. Unemployment rates for these group are less volatile and their respective Okun's elasticities suggest they are likely to make employment adjustment stickier at times of output fluctuations.

Domestic price pressures – GDP deflator

Decomposition of the GDP deflator

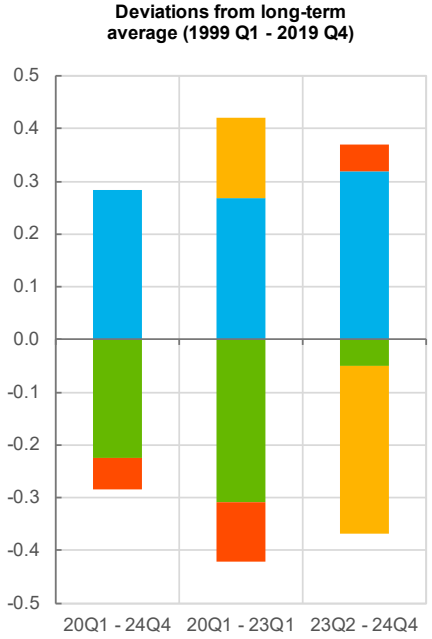
(annual percentage change and percentage point contributions)



Sources: Eurostat and ECB staff calculations.
Notes: The latest observations are for the second quarter of 2025. Legend applies to both charts on this slide.

GDP deflator deviations

(average deviations from long-term average (1999Q1 to 2019Q4) in percentage points)

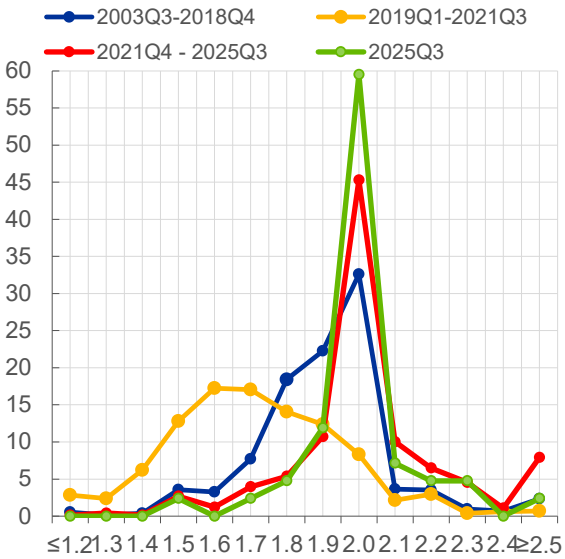


Sources: Eurostat and ECB staff calculations.
Notes: For reasons of additivity, the contribution of labour productivity is derived as the residual between the contributions from unit labour costs and compensation per employee. The latest observations are for the fourth quarter of 2024.

Anchoring of inflation expectations and trend inflation

Histogram of longer-term SPF inflation expectations

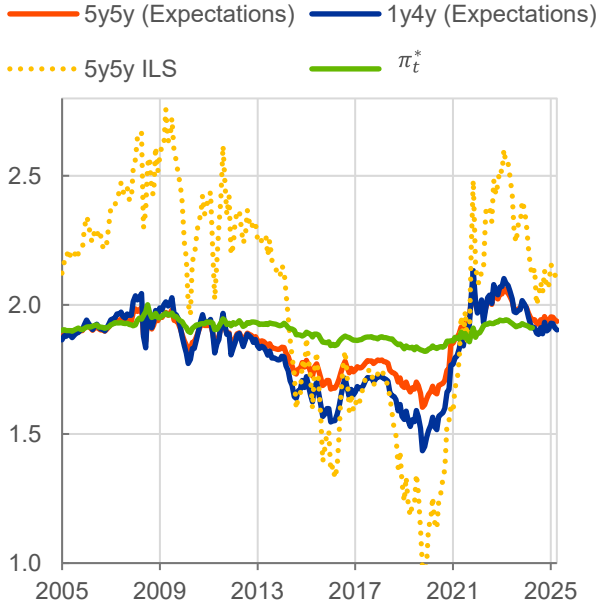
(point estimate; share of respondents in %)



Sources: ECB SPF, and SPF
Notes: SPF expectations for 4 or 5 years calendar year ahead.

Market-based measures of longer-term inflation expectations

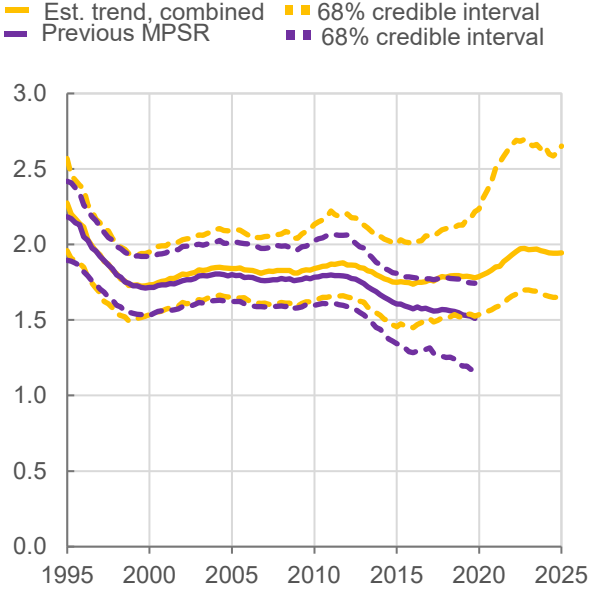
(annual percentage changes)



Sources: LSEG, Burban et al. (2024) and ECB staff calculations.
Notes: The green line displays adjusting end-point infinite horizon inflation expectations using the model of Burban et al. (2024). Inflation expectations (red and blue) are based on estimates from two affine term structure models using inflation-linked swap rates as in Joslin, Singleton and Zhu (2011) applied to ILS rates not adjusted for indexation lag; see Burban et al. (2021), ECB Economic Bulletin Issue 8, 2021, Box 4. The yellow dotted line displays the unadjusted 5y5y ILS. The latest observations are for November 2024 and September 2025.

Comparison of estimated trend component to previous MPSR

(annual percentage changes)



Sources: Eurostat, ECB projections data base and ECB staff calculations. Notes: Estimated trends from a Phillips curve models linking inflation gap to output gap. The Phillips curve approach follows Chan, Clark and Koop (2018) and allows for time-varying coefficients and variances. The results from non-anchored and anchored specifications are pooled. "Previous MPSR" reports estimates based on the data available at the beginning of 2020 (and reported in Box 2 in Koester et al. (2021)). The latest observations are for the first quarter of 2025 and the fourth quarter of 2019.

Structural factors affecting the economic and inflation environment

Structural factors	Changes since 2021 MPSR
Geo-economic environ-ment	**Significant change:** geopolitical tensions increased; shift in US trade policies; fragmentation underway
Climate	**Acceleration:** climate effects **materialising faster;** transition policies **increasingly affecting inflation**
Digitali-sation	**New phase** with generative AI, although pace of adoption and impact of technologies still uncertain
Demo-graphics	**Outlook largely unchanged**: society ageing, uncertainty about migration impact

Effects of fragmentation on euro area real GDP and consumer prices

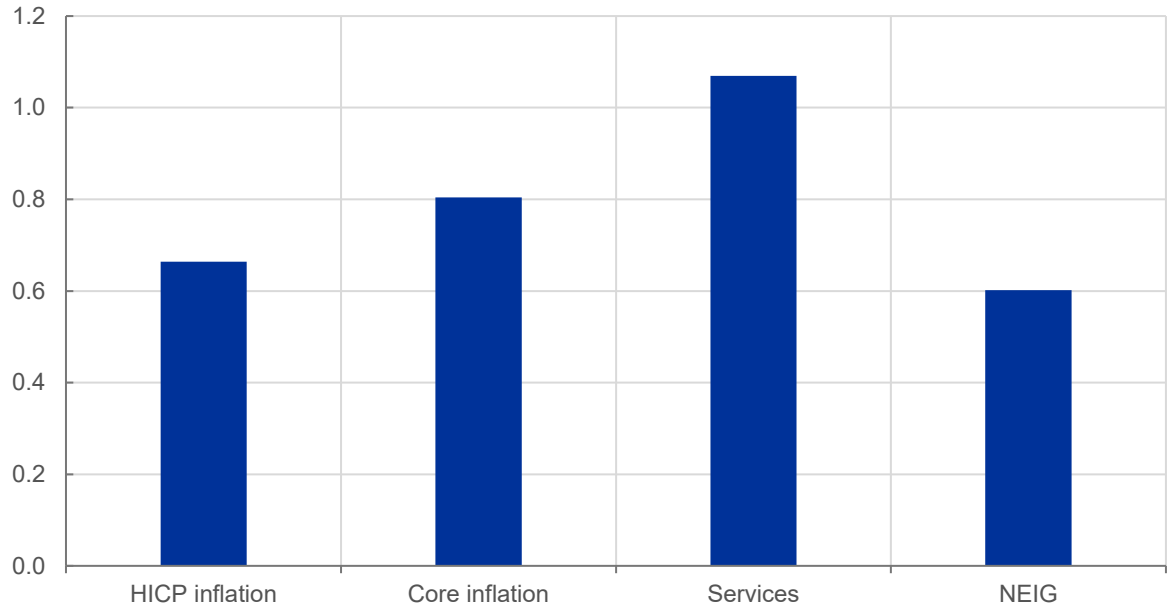
(percent)

Sources: Attinasi et al. (2023c), Lim et al. (2021), Felbermayr et al. (2023), Goers and Bekkers (2022), Cerdeiro et al. (2021), Attinasi et al. (2024), Quintana (2024), OECD TiVA, EORA, and authors' calculations.
Notes: The chart shows peak impact on euro area real GDP and prices across scenarios in cited studies. Whiskers show minimum and maximum, box refers to interquartile range.

Impact of an increase in uncertainty

Effects of higher uncertainty on inflation volatility

(p.p. deviation from baseline standard deviation)



Sources: Kase and Rigato (2025).
Notes: The chart shows the difference in model-based inflation volatility after an increase in firm uncertainty (50% increase in the standard deviation of idiosyncratic risk compared to the baseline model values). Inflation volatility is measured as the standard deviation of the unconditional distribution of inflation in each model, and it is compared to the distribution in the baseline model with the original values for risk.

Uncertainty measures and illustration of scenarios

Pros and cons of existing uncertainty measures

(yes/no indicates whether a characteristic is fulfilled or not)

	Sensitivity analysis	QRA	Scenarios
Easy to interpret and to communicate to the GovC	yes	yes/no	yes
Narrative-based: informs on the mechanisms through which the risk would impact the economy	no	no	yes
Forward-looking	yes	yes	yes
Enables to assess the probability of risk factors	yes	yes	no

Note: QRA denotes Quantitative Risk Analysis - internal survey-based density forecast which summarises staff views on the main risks and uncertainties."

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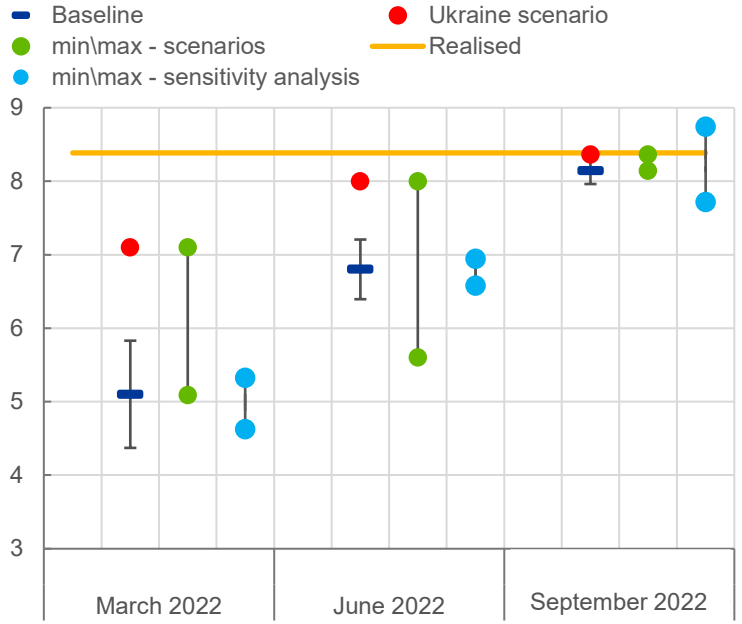
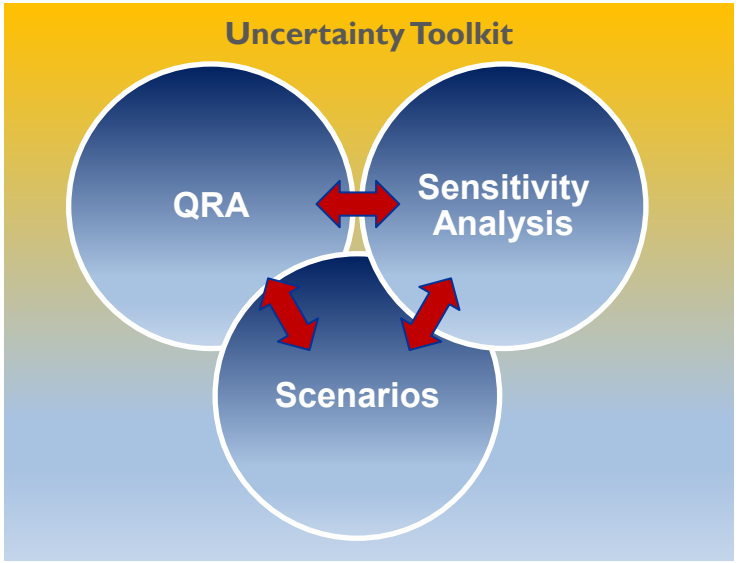
Alternative scenarios and sensitivity analysis for HICP inflation for 2022

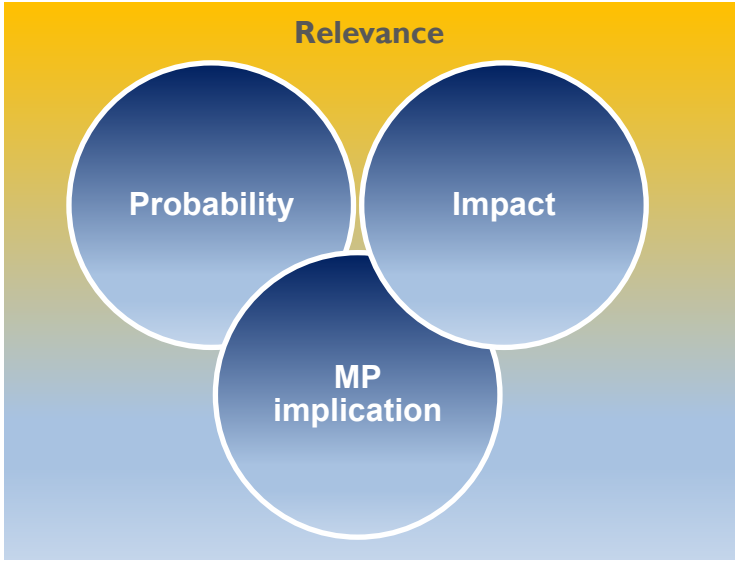
(annual percentage changes)



Sources: ECB/Eurosystem staff projections and ECB calculations.
Notes: The ranges surrounding the respective baseline refer to a measure of uncertainty based on past projection errors, after adjustment for outliers, showing the 90% probability that the outcome of HICP inflation will fall within this interval. Max and Min for sensitivity analyses refer to the highest and lowest outcome from sensitivity analyses related to energy prices, exchange rates and market interest rates. Max and Min for scenarios refer to the highest and lowest outcome from various scenarios including scenarios on the war in Ukraine, higher inflation expectations, real wage catch up etc.

Recommendation for the conduct of scenario analysis





- Existing toolkit will continue to play a prominent role in light of increased uncertainty, consistency important.
- Clear criteria for selection of relevant scenarios at an early stage and to avoid proliferation.
- Intuitive scenario design with focus on euro area core macroeconomic variables, following collaborative work spirit between the ECB and NCBs staff.

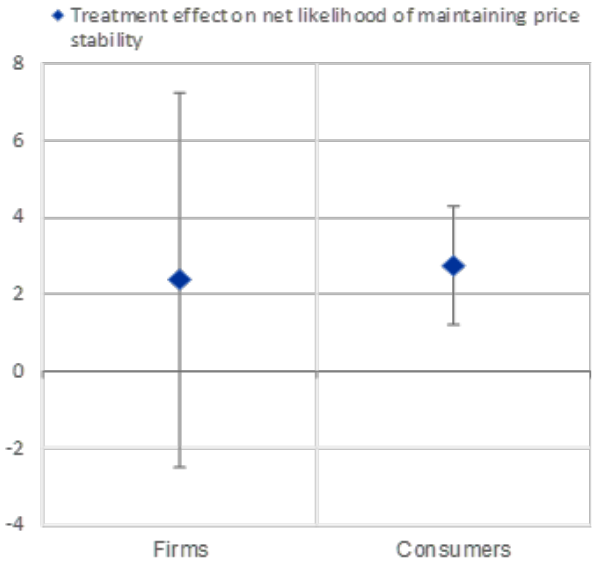
Report of workstream 2: “Monetary policy tools, strategy and communication”

ECB Occasional paper No. 372:
https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op372.en.pdf

ECB's symmetric 2% medium-term inflation target confirmed

Awareness of the ECB's inflation target among consumers and firms and its impact on central bank credibility

(increase in perceived likelihood in percentage points)



Source: WS2 report, Chapter 5.1, Chart 59, p. 137. Survey on the access to finance of enterprises (SAFE) and Consumer Expectations Survey (CES).
Note: The plot illustrates the estimated coefficient (with robust standard errors; 95% confidence intervals indicated by the whiskers) for the treatment dummy in a regression model where the dependent variable corresponds to the perceived likelihood of firms and consumers that the price stability target will be met over the next 3 years. The numeric answers by consumers were converted into a binary variable using a likelihood threshold of 70% (results are robust to other threshold values). See Ehrmann, Georgarakos and Kenny (2023) for more information.

Symmetric 2% target has served ECB well since conclusion of Strategy Review 2020-21

- Enhanced target clarity strengthened anchoring of inflation expectations coming out of low-inflation period and – backed by forceful tightening – helped to keep expectations anchored during inflation surge

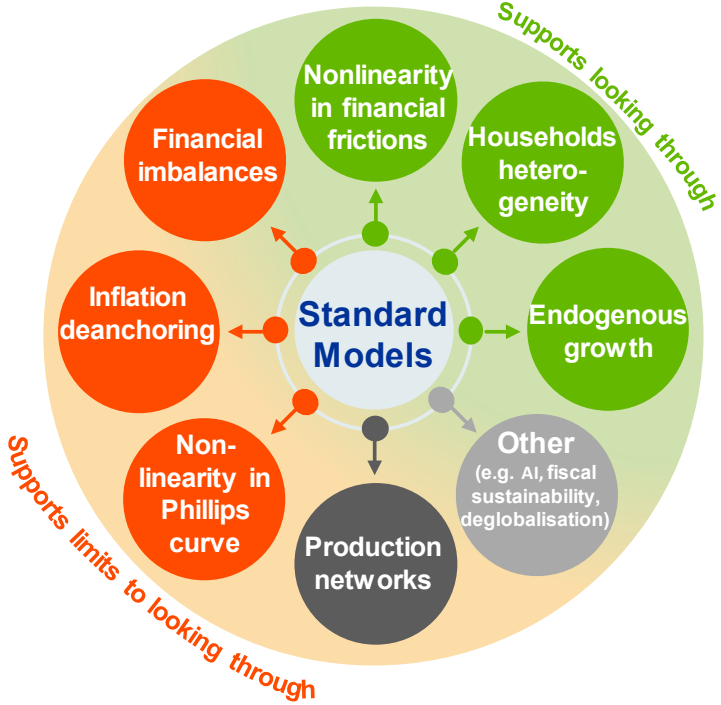
The target also supported clearer communication of the ECB's strategy to the public at large

- Survey evidence based on randomised control trials suggests that providing information about the ECB's inflation target enhances credibility

5. The Governing Council considers that price stability is best maintained by aiming for two per cent inflation over the medium term. The Governing Council's commitment to this target is symmetric. Symmetry means that the Governing Council considers negative and positive deviations from this target as equally undesirable. The two per cent inflation target provides a clear anchor for inflation expectations, which is essential for maintaining price stability.

Medium-term orientation and “looking through” supply shocks

Channels emphasised in recent literature and typically not considered in standard projection and policy models



Source: WS2 report, Chapter 3.1.2, Chart 29, p. 86.

“Looking through” temporary shocks remains valid but potential for large, sustained target deviations becoming entrenched is key limiting factor

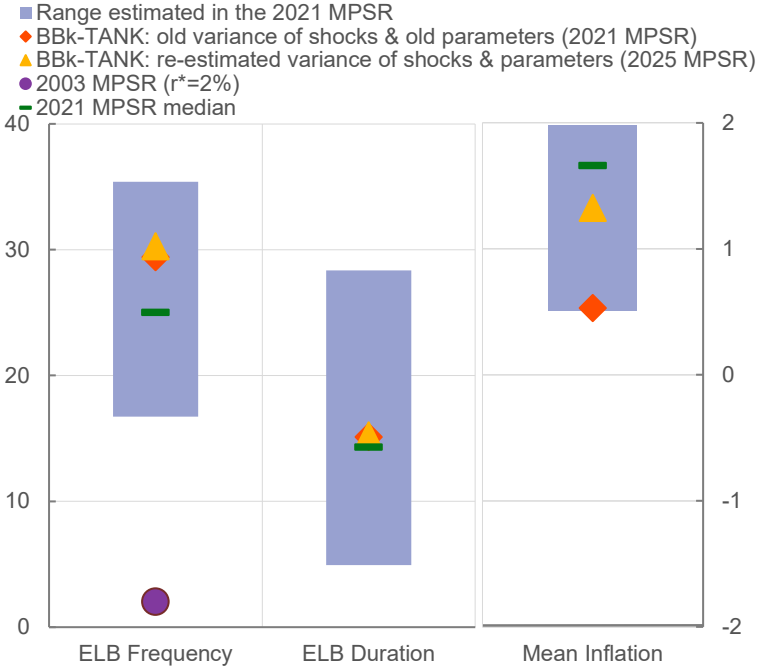
- Inflation surge period: sizeable de-anchoring risks called for forceful action while non-linearities (esp. temporarily higher frequency of price adjustment) reduced economic cost of policy tightening
- Relative importance of channels is context-specific (post-GFC: financial frictions and hysteresis effects)

7. The Governing Council confirms the medium-term orientation of its monetary policy strategy. This allows for inevitable short-term deviations of inflation from the target, as well as lags and uncertainty in the transmission of monetary policy to the economy and to inflation. The flexibility of the medium-term orientation takes into account that the appropriate monetary policy response to a deviation of inflation from the target is context-specific and depends on the origin, magnitude and persistence of the deviation. Subject to maintaining anchored inflation expectations, it also allows the Governing Council in its monetary policy decisions to cater for other considerations relevant to the pursuit of price stability.

The case for forceful or persistent policy action close to the ELB (confirmed)

Implications of the ELB: updated estimates

(percentages; quarters; year-on-year percentage change)



Source: WS2 report, Chapter 3.2.1, Chart 33, p. 95.
Note: The Bundesbank-TANK model is estimated on both pre-Covid data (matching information available at time of 2021 MPSR) and more recent data up to 2023Q4 (to account for changes in the variance of shocks and parameters). The simulations are based on a value of r* calibrated at +0.5%. The 2021 estimate is the median across models reported for the 2021 strategy review. The 2003 estimates refer to the 2003 strategy review based on an estimate of r*=2%.

The ELB on nominal interest rates continues to constrain the conduct of monetary policy in the event of significant disinflationary shocks

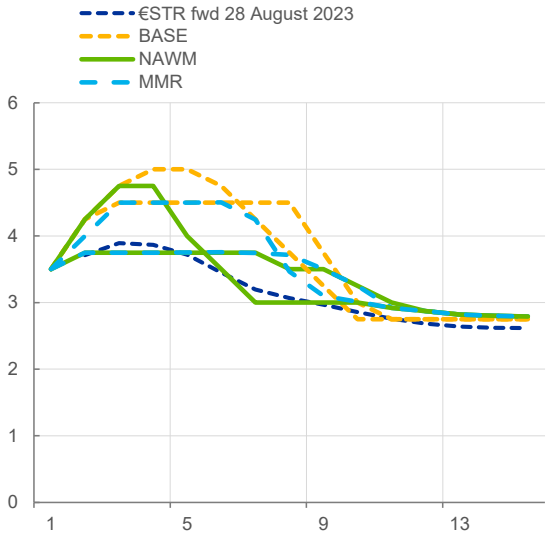
- r* remains low in the euro area, even though may have increased somewhat recently
- Additional factors shaping ELB cost (increased variance of shocks, steeper Phillips curve) largely cancel out and changes may prove temporary.
- Inherent temporal dimension: forcefulness early on, persistence at or close to ELB

6. To maintain the symmetry of its inflation target, the Governing Council recognises the importance of appropriately forceful or persistent monetary policy action in response to large, sustained deviations of inflation from the target in either direction, to avoid deviations becoming entrenched through de-anchored inflation expectations. In the event of significant disinflationary shocks, the effective lower bound on nominal interest rates needs to be taken into account. In the event of significant inflationary shocks, possible non-linearities in price and wage setting need to be taken into account.

The case for forceful or persistent policy action to the upside

Real-time model-based analysis of forceful versus persistent policy (September 2023 staff projections)

Length versus level restriction tactics
(x-axis: quarters, y-axis: percent per annum)



Source: WS2 report, Chapter 3.2.5, Chart 41, p. 108. ECB staff calculations using the New Area-Wide Model (Coenen, G. et al., 2018), the MMR model (Mazelis et al., 2023), and the BASE model (Angelini, E. et al., 2019).
Note: The chart displays illustrative paths that close the average-2025 inflation gap in three different models, either following a level or length tactic. €STR forward rates are not adjusted for premia.

- Recent inflation surge period illustrated that forceful or persistent action also warranted for large, sustained upside deviations of inflation from target
  - Policy tightening was forceful in early phase after lift-off (350 bps of cum. rate hikes July 22 - March 23)
  - Afterwards, emphasis increasingly shifted from forcefulness to persistence (length of holding period)
  - While there is no upper bound on rates, risks and side effects associated with tightening increase as rates move deeper into restrictive territory

6. To maintain the symmetry of its inflation target, the Governing Council recognises the importance of appropriately forceful or persistent monetary policy action in response to large, sustained deviations of inflation from the target in either direction, to avoid deviations becoming entrenched through de-anchored inflation expectations. In the event of significant disinflationary shocks, the effective lower bound on nominal interest rates needs to be taken into account. In the event of significant inflationary shocks, possible non-linearities in price and wage setting need to be taken into account.

Accounting for risk and uncertainty in policy setting

Range of losses of alternative rate paths under different scenarios

		Outcome		
[MMR | NAWM | BASE]		Baseline	Persistent inflation	Strong transmission
Weights: Inflation gap=1, Output gap=0				
Path	*Level* tactic	[13.4 |13.9 |15.7]	[14 |14.5 |16.5]	[9.1| 9.5 |10.4]
	Length tactic	[15.3 |17.4 |16]	[16 |18.2 |16.8]	[10.2 |11.4 |10.6]
Weights: Inflation gap=1, Output gap=0.25				
Path	*Level* tactic	[20.9 |21.3 |21.5]	[20.3 |20.7 |21.2]	[27| 27.2 |25.1]
	Length tactic	[20.2 |21.2 |21.4]	[20 |21.3 |21.1]	[23.7 |22.6 |24.5]

Sources: WS2 report, Chapter 4.3, Table 5, p. 120. ECB staff calculations based on the September 2023 ECB staff macroeconomic projections.
Note: The numbers reported in the cells correspond to the loss (based on quadratic loss function) in the models listed in the following order [MMR | NAWM | BASE]: the MMR model (Mazelis et al., 2023), the New Area-Wide Model (Coenen et al., 2018), and the BASE model (Angelini et al. 2019). Red numbers indicate the path and contingency with the highest loss. A weight of 0.25 on the output gap follows the literature (Kiley and Roberts, 2017) and practice in other policy institutions (Yellen, 2012).

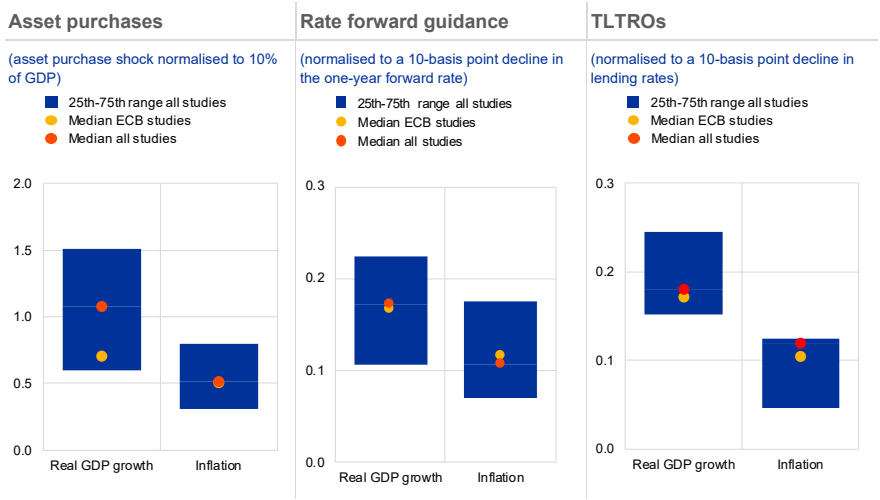
- Despite significant modeling advances, remains challenging to draw general policy implications
  - Analytical approaches feature trade-off between robustness and performance (tail risk vs more likely but narrower scenarios)
  - Mechanical adjustment to the reaction function not advisable as nature of scenario may call either for policy attenuation or for aggressive policy response.
  - Overall, desirable for monetary policy to take into account risks and uncertainty, using a systematic but context-specific approach

8. […] The choice, design and implementation of instruments will enable an agile response to new shocks […]

9. […] In particular, it takes into account not only the most likely path for inflation and the economy but also surrounding risks and uncertainty, including through the appropriate use of scenario and sensitivity analyses. […]

The monetary policy toolkit: effectiveness

Estimated impact of the ECB's monetary policy measures on euro area inflation and growth – a meta-analysis among ECB and NCB researchers



Source: WS2 report, Chapter 2.2.1, Chart 5, p. 15. Andrade et al. (2016), Burlon et al. (2015), Cova et al. (2019), Gambetti and Musso (2017), Gerke et al. (2018), Haldane et al. (2016), Hohberger et al. (2019), Kühl (2018), Mouabbi and Sahuc (2019), Nelimarkka and Kortela (2020), Pascual and Wieladek (2016), Sahuc (2016), Rostagno et al (2021b), Mandler and Scharnagl (2020, 2022), Goodhead (2024), Bartocci et al. (2024), Laine and Nelimarkka (2021, 2023), ECB and ECB calculations.

Notes: Horizons of cumulated macroeconomic effects differ across studies, ranging from 1 to several years.

Panel a) The chart shows the median and 25th-75th interquartile range of estimates from a range of studies mentioned above, as well as the range of ECB and NCB estimates comprising the Eurosystem staff assessment based on a suite of structural and time series models, the extended New Area-Wide Model (NAWM-II), the ECB-BASE model and the assessment documented in Rostagno et al. (2021b). The estimate refers to the cumulative impact on euro area inflation and real GDP growth of an increase in the stock of asset purchases normalised to 10% of euro area GDP.

Panel b) The chart shows the median and 25th-75th interquartile range of estimates from a range of studies mentioned above and a range of models developed by the Eurosystem FORE Taskforce (ECB Occasional Paper Series, 2021), comprising time series models and structural models, as well as the range of ECB staff estimates. The estimate refers to the cumulated impact on euro area inflation and real GDP growth of a forward guidance shock normalised to a 10-basis point decline in the one-year forward rate.

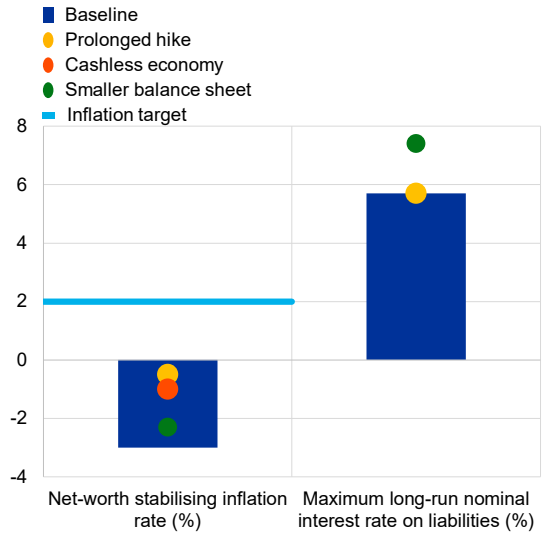
Panel c) The chart shows the median and 25th-75th interquartile range of estimates from a range of studies mentioned above and a range of ECB models, including the following six models: (1) Christiano, Motto and Rostagno (2010, 2014); (2) Altavilla at al. (2020); (3) Darracq-Pariès and De Santis (2015); (4) a medium-scale Bayesian vector autoregression (BVAR) model for the euro area; (5) the NAWM-II; and (6) the ECB-BASE. The impact on inflation and real GDP growth refers to the cumulative impact over the simulation horizon from a 10 basis point decline in bank lending rates.

- Overall, the set of instruments deployed by the ECB has proven effective in countering disinflationary risks and/or safeguarding risks to the transmission of the policy stance, and they should all remain part of the toolkit
  - Advisable to deploy mix of instruments near ELB rather than excessively relying on single instruments
  - When combined, instruments tend to reinforce each other … but, an active blending can also create undesired effects, e.g. reducing policy flexibility to respond to inflationary shocks in agile way

8. The Governing Council is committed to setting monetary policy to ensure that inflation stabilises at the two per cent target in the medium term. The primary monetary policy instrument is the set of ECB policy rates. The Governing Council may also employ other instruments, as appropriate, to steer the monetary policy stance when the policy rates are close to the lower bound or to preserve the smooth functioning of monetary policy transmission. Such instruments include longer-term refinancing operations, asset purchases, negative interest rates and forward guidance. […]

The monetary policy toolkit: trade-offs and side effects

Net worth-stabilizing inflation rate and maximum long-run nominal interest rate on liabilities
(percentage per annum)



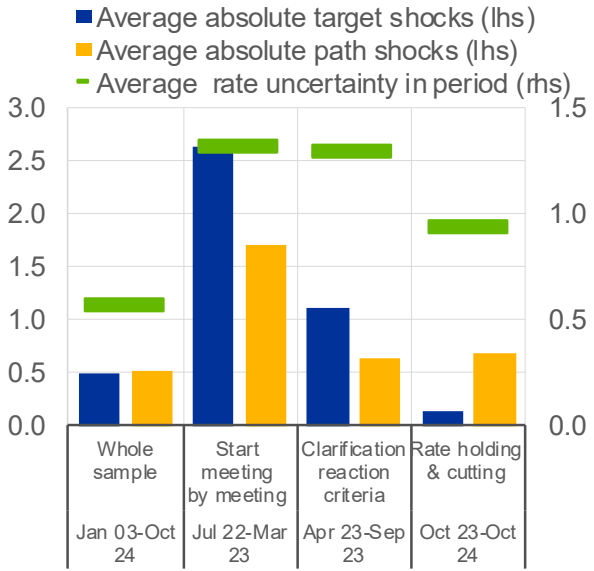
Source: WS2 report, Chapter 2.2.3, Chart 13, p. 37. Ize (2005) and ECB calculations.
Notes: The net-worth stabilising inflation rate is the minimum inflation rate required for the Eurosystem to maintain non-negative net worth in the long run. The maximum long-run nominal interest rate on liabilities is the maximum rate the Eurosystem can afford to pay on its liabilities to maintain non-negative net worth in the long run. Both concepts are derived from the framework described by Ize (2005).

- Clear trade-off between commitment and flexibility if circumstances change abruptly and substantially, to be recognised in instrument design
- Importance of continuously monitoring side effects confirmed
  - Side effects overall contained but larger than expected for central bank profitability, even if losses do not threaten ability to maintain price stability
  - Where two alternative instrument designs equally effective in terms of price stability, prefer the more efficient design

8. […] The Governing Council will continue to respond flexibly to new challenges as they arise and will consider, as needed, new policy instruments in the pursuit of its price stability objective, as evidenced by the introduction of the Transmission Protection Instrument in 2022. The choice, design and implementation of instruments will enable an agile response to new shocks and will appropriately reflect the intended aims, whether the calibration of the monetary policy stance or the protection of monetary policy transmission, subject to a comprehensive proportionality assessment.

Rate and rate guidance policy shocks within the GovC policy window

(standard deviations)



Source: WS2 report, Chapter 5.3, Chart 63, p. 145.
Note: The model decomposes the yield curve into movements along the Target, Path, QE, and Transmission components as documented in Akkaya, Bitter, Brand and Fonseca (2024b). The Target factor captures surprises to the expectations of the current short-term rate through movements in risk free yields at very short maturities up to six months. The Path factor is related to surprises to the future interest rate path, reflected in changes in yields between six months and two years. Average interest rate uncertainty is based on the option-implied standard deviation of the 3-month Euribor 1-year ahead. Median change in monetary policy uncertainty is the change in interest rate uncertainty on Governing Council days.

Inflation surge highlights challenges for policy communication under heightened uncertainty

- GovC adapted to challenges of refraining from (conditionally) committing to particular rate path by clarifying its reaction function in March 2023
- After March 2023, market movements following policy decisions became less pronounced
- Additional criteria (underlying inflation, strength of transmission) simplified the communication of complexity associated with risks and uncertainty, fostering robustness while preserving agility
- Monetary policy statements since July 2025 have contained explicit reference to “risks”, in line with emphasis in June 2025 strategy statement

In particular, the Governing Council’s interest rate decisions will be based on its assessment of the inflation outlook and the risks surrounding it, in light of the incoming economic and financial data, as well as the dynamics of underlying inflation and the strength of monetary policy transmission. (MPS, 24 July & 11 Sept. 2025)