BANCA D'ITALIA
EUROSISTEMA

Temi di discussione

(Working Papers)

What drives policy rate expectations? Evidence from the post-pandemic monetary policy cycle

by Luca Baldo and Marco Bernardini

October 2025

Number 1500

BANCA D'ITALIA
EUROSISTEMA

Temi di discussione

(Working Papers)

What drives policy rate expectations? Evidence from the post-pandemic monetary policy cycle

by Luca Baldo and Marco Bernardini

Number 1500 - October 2025

ISSN 2281-3950 (online)

Designed by the Printing and Publishing Division of the Bank of Italy

WHAT DRIVES POLICY RATE EXPECTATIONS?
EVIDENCE FROM THE POST-PANDEMIC MONETARY POLICY CYCLE

by Luca Baldo* and Marco Bernardini*

Abstract

We investigate how demand and supply shocks, as perceived by markets, shaped revisions in expected ECB and Fed policy rates during the post-pandemic monetary policy cycle. To this end, we construct a measure of revisions in near-term policy rate expectations and embed it in a two-country daily BVAR model identified through sign and magnitude restrictions. Three patterns emerge. First, both central banks were perceived as more responsive to inflation than in the pre-ELB period, under both demand and supply shocks. Second, supply shocks were seen as being treated similarly to demand shocks, reflecting a lower perceived tolerance for supply-driven inflation. Third, supply shocks became a new source of cross-border spillovers in rate expectations. These findings point to a reconfiguration of perceived central bank reaction functions in high-inflation environments, when the risk of expectations de-anchoring becomes material.

JEL Classification: E52, E44, C32, F42.

Keywords: monetary policy, VAR, daily data, demand and supply shocks, international spillovers.

DOI: 10.32057/0.TD.2025.1500

* Banca d'Italia, DG Economics, Statistics and Research.

1 Introduction[1]

Expectations of future policy rates lie at the center of the monetary policy transmission mechanism. They form the basis for all market interest rates and broader financing conditions, influencing economic activity and inflation even before any policy action is taken. At short horizons, expectations primarily reflect how policy is anticipated to respond to evolving business cycle conditions. Understanding the drivers of revisions in near-term policy rate expectations – and, by extension, the perceived central bank reaction function – is therefore crucial, given their central role in shaping the business cycle.

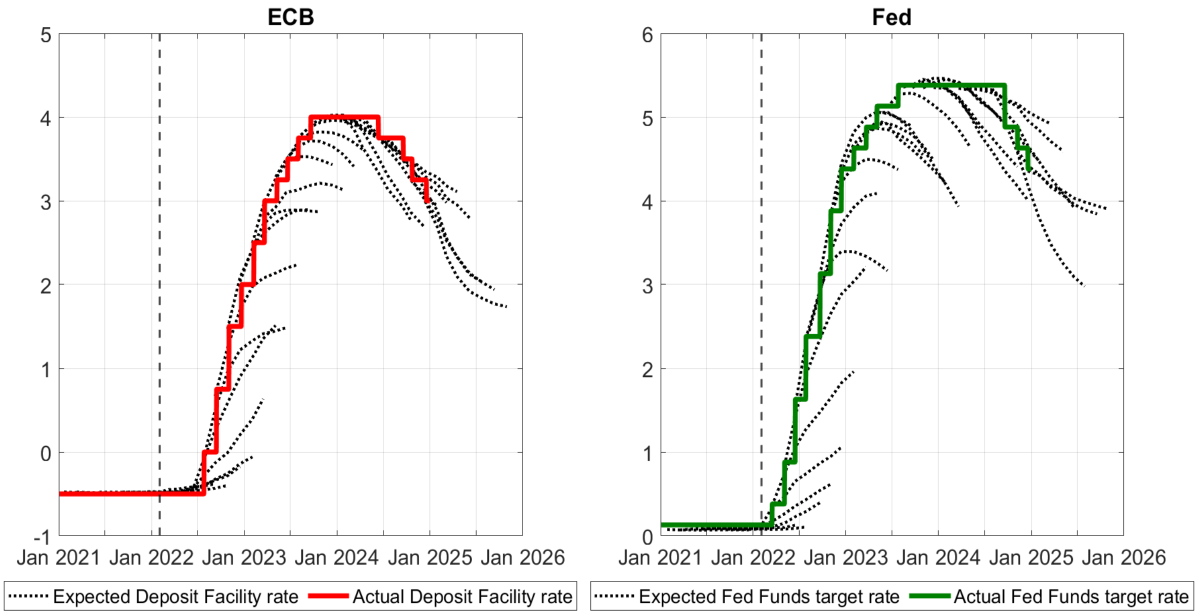
Despite their relevance, the drivers of near-term policy rate expectations remain largely unexplored. Two factors have constrained research in this area over the past two decades. First, following the 2008 Global Financial Crisis (GFC), policy rates stayed near the effective lower bound (ELB) for an extended period, reducing variation in both actual and expected short-term rates as central banks relied increasingly on unconventional tools. Second, prior to 2006, the limited availability of daily market-based expectations of macroeconomic variables – whose high-frequency variation can help identify the shocks driving near-term rate expectations – limited the ability to conduct a comprehensive analysis on their underlying drivers.

Against this backdrop, the post-pandemic monetary policy cycle offers a unique case study. Starting in early 2022, central banks worldwide initiated a forceful tightening cycle in response to the most severe inflation surge since the 1970s. The solid lines in Figure 1 show policy rates of the Federal Reserve (Fed) and the European Central Bank (ECB) – the monetary authorities of the world's two largest currency areas – which rose cumulatively by 5.25 and 4.5 percentage points, respectively, between 2022 and 2023. A notable feature of this period was the presence of large, repeated upward revisions in market expectations for future policy rates, illustrated by the dashed lines in Figure 1.

This paper exploits the rich high-frequency variation in short-term market interest rates during the post-pandemic monetary cycle to address three questions at the heart of monetary economics. First, are central banks perceived to respond differently to demand- versus supply-driven inflation, given the distinct implications of each for inflation and output stabilization? Second, do expectations of policy rates in one currency area influence those in another, and does this depend on the nature of the underlying shock? Finally, are perceptions of the central bank's reaction function reshaped in a high-inflation environment?

[1]The views expressed in this paper are those of the authors and do not necessarily reflect those of Banca d'Italia or the Eurosystem. We thank Georgios Georgiadis, Silvia Miranda-Agrippino, Gert Peersman, and Jean-Paul Renne for their valuable comments and discussions. We are also grateful to our colleagues in the Economic Outlook and Monetary Policy Directorate for their continuous input, as well as to participants in the 4th Banca d'Italia–EIEF Macro-Monetary Workshop, the 12th Ghent University Workshop on Empirical Macroeconomics, the 13th Annual Conference of the International Association for Applied Econometrics, and the 5th Sailing the Macro Workshop for their helpful feedback.

Figure 1. Market expectations of ECB and Fed rates in 2020-24



Notes. The figure shows actual and expected ECB and Fed monetary policy rates (in percent). Solid lines denote actual Deposit Facility Rates (DFR) and Fed Funds Target Rates (FFTR, upper limit). Dotted lines denote expected rates over a one-year horizon, derived from €STR and EFFR forward-starting swap contracts indexed to ECB and Fed meeting dates, from January 2021 to December 2024. The vertical line in February 2022 marks the point when both ECB and Fed expectations begin to exhibit noticeable variation.

To answer these questions, we construct a daily market-based measure of revisions of near-term policy rate expectations for the ECB and the Fed and embed them in a two-country daily Bayesian Vector Autoregression (BVAR) model. The underlying drivers of the revisions in policy rate expectations are identified on a continuous, day-by-day, basis using a set of sign and magnitude restrictions, allowing for a structural shock decomposition by type (monetary policy, demand, and supply shocks) and geographic location (euro-area and US shocks).

Key findings. The post-pandemic monetary cycle yields three main insights. First, both the ECB and the Fed were perceived as more responsive to inflation than in the pre-ELB period. Notably, this stronger responsiveness applied regardless of the perceived source of inflation: for a given increase in expected inflation – whether seen as demand- or supply-driven – markets in both currency areas anticipated a larger rise in policy rates than in the past.

Second, supply shocks were perceived as eliciting a response broadly similar to that for demand shocks. The response to demand-driven inflation was indeed stronger – consistent with the theoretical prediction that such shocks call for a more forceful adjustment – but only modestly so, on the order of 20% more. By contrast, we document that before the ELB, central banks were seen as responding much more aggressively to demand-driven inflation, roughly two to three times more. These results indicate a substantial decline in the perceived tolerance for supply-driven inflation in the post-pandemic monetary cycle.

Third, supply shocks emerged as a new source of cross-border spillovers in policy rate expectations. We document that both US demand and supply shocks exerted a sizable influence on ECB rate expectations, whereas all other shocks – i.e., those originating in the euro area or stemming from monetary policy shocks in either region – are estimated to have weaker effects in both the magnitude and the credibility of the estimates. Comparing these results with the pre-ELB period reveals a clear pattern: while the cross-border effects of US demand shocks were already evident before the ELB, those from US supply shocks represented a new channel, having previously had no meaningful impact on expected ECB rates.

Taken together, these findings point to a reconfiguration of perceived central bank reaction functions under conditions of high inflation. In the post-pandemic monetary cycle, both the ECB and the Fed were perceived as placing greater emphasis on inflation control, even when inflation was seen as supply-driven. These perceptions resonate with the broader view that, amid persistent inflation and elevated risks of expectations de-anchoring, central banks face stronger incentives to prioritize price stability more decisively. In such circumstances, the distinction between demand- and supply-driven inflation may become less relevant, as even supply shocks may prompt a forceful policy response to safeguard credibility and prevent self-fulfilling inflation dynamics.

Contribution to the literature. This paper contributes to four strands of the literature. First, it adds to the literature on monetary policy responses to demand- and supply-driven inflation.[2] Hofmann et al. (2024a,b) shows that, historically, central banks in advanced economies have responded more forcefully to demand-driven inflation than to supply-driven inflation, in line with theoretical predictions that call for a more muted response to supply shocks given the trade-off they entail between inflation and output stabilization (Erceg et al., 2000; Bodenstein et al., 2008; Guerrieri et al., 2023). This paper complements that evidence by documenting that markets have historically perceived a similar asymmetry, but that this perception largely faded during the post-pandemic monetary cycle.

Second, the paper advances the literature on perceptions of monetary policy rules. Recent studies have explored the relationship between policy rate expectations and inflation expectations using survey and market data within simple Taylor-rule frameworks (Bauer et al., 2024a,b; Bernardini and Lin, 2024; Cuciniello, 2024). This paper moves beyond these reduced-form approaches by employing a structural

[2]The paper also indirectly connects to work on the drivers of the post-pandemic inflation (Giannone and Primiceri, 2024; Neri, 2024; Shapiro, 2024; Bernanke and Blanchard, 2025; Bobeica et al., 2025; De Santis and Tornese, 2025), though the focus here is on how the (perceived) nature of inflation shapes (expectations about) the monetary policy response.

VAR, which enables the analysis of perceived reaction functions through responses to domestic and foreign demand and supply shocks. Our findings reveal that, compared with the past, supply shocks have played a greater role in shaping the perceived responsiveness to inflation during the post-pandemic monetary cycle, both domestically and across borders.

Third, the paper contributes to the literature on cross-border spillovers in short-term interest rates. Existing work has largely focused on high-frequency monetary policy surprises (Kalemli-Özcan, 2019; Jarociński and Karadi, 2020; Cesa-Bianchi and Sokol, 2022; Georgiadis and Jarociński, 2025) or monetary policy shocks more generally (Dedola et al., 2017). In contrast, our approach captures a broader set of disturbances, including demand and supply shocks.[3] In this regard, we find that cross-border spillovers in short-term rates are stronger for demand and supply shocks than for monetary policy shocks, suggesting that changes in domestic rates driven by expectations of systematic policy responses tend to affect foreign rates more than those driven by perceived discretionary actions. We also document that these spillovers are notable asymmetric: US shocks meaningfully influence euro-area short-term rates, whereas the reverse effect is much weaker. To the best of our knowledge, this is the first study to show that US shocks have historically accounted for a substantial share – around one-third on average across the pre-ELB and post-pandemic periods – of *near-term* expectations of policy rates in the euro area, the world's second-largest currency area after the United States.

Lastly, our paper contributes to the literature employing daily VAR models to identify the drivers of interest rates and broader financial conditions. While previous studies have focused on changes in medium- and long-term rates (Brandt et al., 2021; De Santis and Zimic, 2022; Höynck and Rossi, 2023), our analysis focus on the drivers of short-term rates, an area that has been largely unexplored in recent decades due to the aforementioned data constraints. Short-term rates are less influenced by term premia than longer-term rates, making them an accurate market-based measure of expectations about the near-term policy rate path. However, their dynamics over time is comparably more predictable, as changes in short-term rates are more likely to simply reflect the evolution of the policy rate along the expected policy rate path rather than revisions to that path. To focus specifically on revisions – the key object for answering the questions posed in this paper – we construct a market-based daily measure for both the ECB and the Fed that captures only unexpected changes.

Outline of the paper. The remainder of the paper is organized as follows. Section 2 outlines the empirical framework used in the analysis. Section 3 presents the main findings, while Section 4 assesses their robustness. Section 5 contextualizes these results by comparing them with those obtained from the

[3] By not restricting attention to monetary policy events, our framework identifies demand and supply shocks that are arguably more fundamental than the "information shocks" typically inferred around policy announcements—shocks that mainly reflect how incoming data influence the central bank's interpretation of the economy rather than the underlying drivers themselves.

available pre-ELB sample. Finally, Section 6 concludes.

2 Empirical framework

This section presents the empirical framework guiding our study, which rests on two complementary pillars. The first pillar is a novel measure of daily revisions in market expectations of policy rates. The second pillar is a two-country daily BVAR model, identified through sign and narrative restrictions, which disentangles revisions into demand- versus supply-driven factors, as well as domestic versus foreign developments.

2.1 Measuring daily revisions in market expectations of policy rates

We measure daily revisions in expected ECB and Fed rates using forward-starting overnight indexed swap contracts linked to monetary policy meeting dates. In these contracts, the two parties exchange a fixed rate (the swap rate) for the average Euro Short-Term Rate (€STR) or Effective Federal Funds Rate (EFFR) – overnight rates closely tied to the ECB and Fed policy rates – that will be realized between two consecutive monetary policy meetings. Given their short-term, risk-free nature, the corresponding swap rates provide an accurate empirical proxy for market-based expectations of monetary policy rates.[4]

Figure 2 provides an example of these market data, showing the €STR and EFFR swap rate curves observed on two consecutive dates: August 4, 2022, and August 5, 2022. The chart shows that on August 4, markets were anticipating a rate hike cycle in both regions, as indicated by the upward-sloping dashed blue lines. It also shows that by August 5, 2022, both expected paths had been significantly revised upwards, with average revisions of 11 basis points for the Fed and 18 basis points for the ECB.

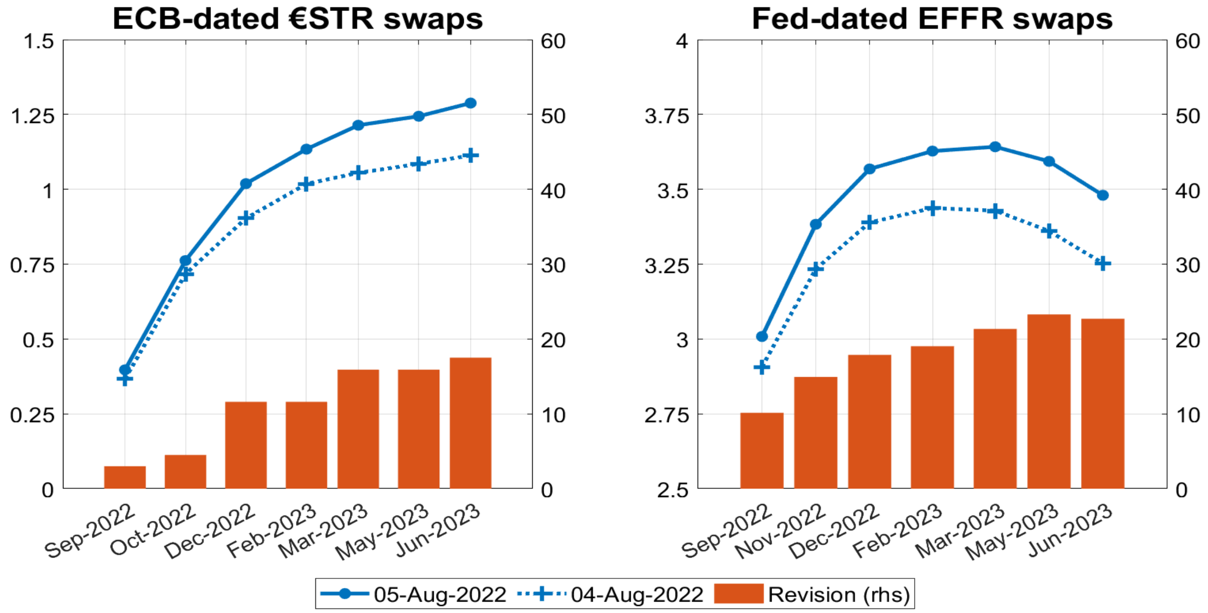
Using these data, we construct daily time series of revisions to near-term expected monetary policy rates for both the euro area and the US for each day in our sample. Specifically, we compute the following measure:

$$\Delta\tilde{i}_t = \frac{1}{7}\sum_{m=1}^{7}\left(i_t^m - i_{t-1}^m\right) \tag{1}$$

where i_t^m represents either the €STR swap rate or the EFFR swap rate on working day t linked to the m-ahead monetary policy meeting. The difference $i_t^m - i_{t-1}^m$ captures the revision in the expected policy rate from day $t-1$ to day t for a specific meeting m, while $\Delta\tilde{i}_t$ measures the average of these daily

[4]Overnight indexed swap (OIS) rates are nearly free of credit and liquidity risk because they involve no exchange of principal, are based on daily rollovers of overnight loans to prime banks, and settle daily, eliminating both credit exposure and liquidity constraints. Moreover, for maturities shorter than one year, they tend to be minimally affected by interest rate risk, meaning that term premia on these rates are typically estimated to be negligible or absent.

Figure 2. Measuring daily revisions in market expectations of policy rates



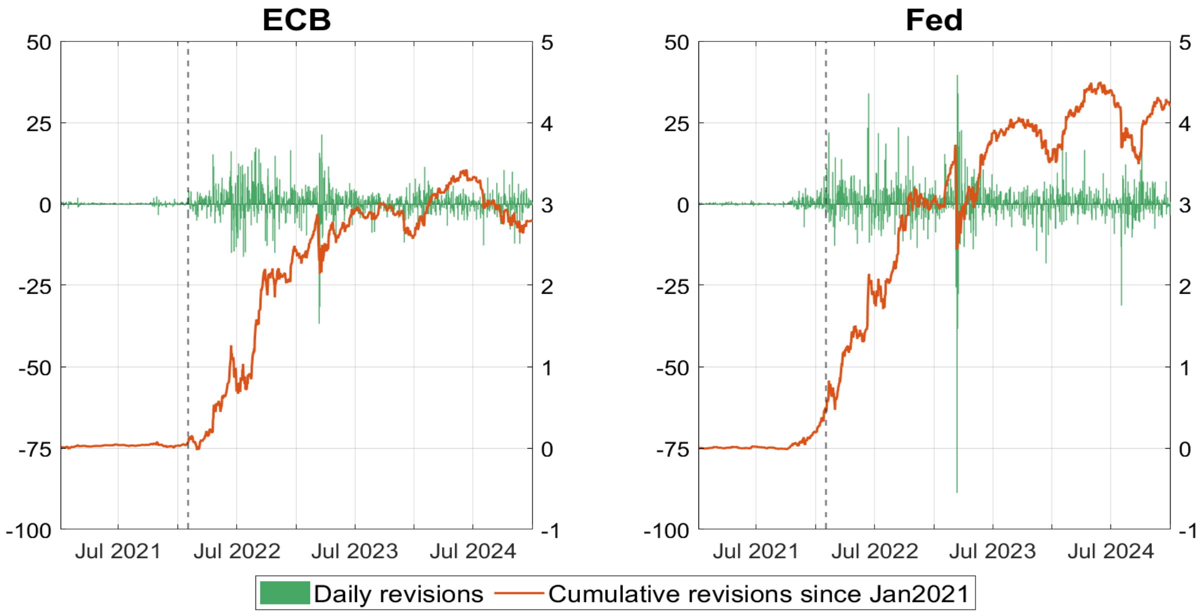
Notes. The figure illustrates how we compute our measure of daily revisions in expected monetary policy rates for a specific day. Blue lines show market expectations for ECB and Fed policy rates at future monetary policy meetings (shown on the x-axis), based on €STR swap and EFFR swap rates observed on two consecutive dates (in percent, left-hand y-axis). Orange bars show the corresponding revisions in these expectations between the two dates (in basis points, right-hand y-axis).

revisions across the next seven meetings (i.e., from $m = 1$ to $m = 7$). Such a period approximates 1-year ahead monetary policy expectations.[5]

Figure 3 shows the daily time series of market revisions in ECB and Fed rate expectations since January 2021.[6] Markets began adjusting their expectations well before the first rate hikes, which occurred in March 2022 for the Fed and July 2022 for the ECB. Revisions were predominantly positive throughout the sample, particularly in 2022 and 2023, reflecting the rapid pace of the tightening cycle. In March 2023, expected ECB and Fed rates fell sharply – by almost 40 bps and 90 bps in a single day, respectively – following the collapse of Silicon Valley Bank (SVB) in the United States. These downward revisions were soon offset by upward adjustments, and by the end of 2023, cumulative revisions had reached over 2.5 percentage points for the ECB and more than 3.5 percentage points for the Fed. In 2024, the balance between positive and negative revisions shifted, coinciding with periods of stable ECB rates until June and Fed rates until September.

[5]Both ECB and the Fed schedule eight monetary policy meetings per year.
[6]Summary statistics are shown in Table A1 in the Appendix.

Figure 3. Daily time series of revisions in market expectations of policy rates



Notes. The figure presents our market-based measure of revisions in near-term market expectations for ECB and Fed monetary policy rates. Revisions to ECB rates are shown in the left panel, while revisions to Fed rates are shown in the right panel. The green bars represent daily revisions, measured in basis points (left axis), while the orange lines illustrate cumulative revisions from January 2021 to December 2024, measured in percentage points (right axis). The dashed vertical line marks the start of the sample period used in the analysis.

2.2 Model structure

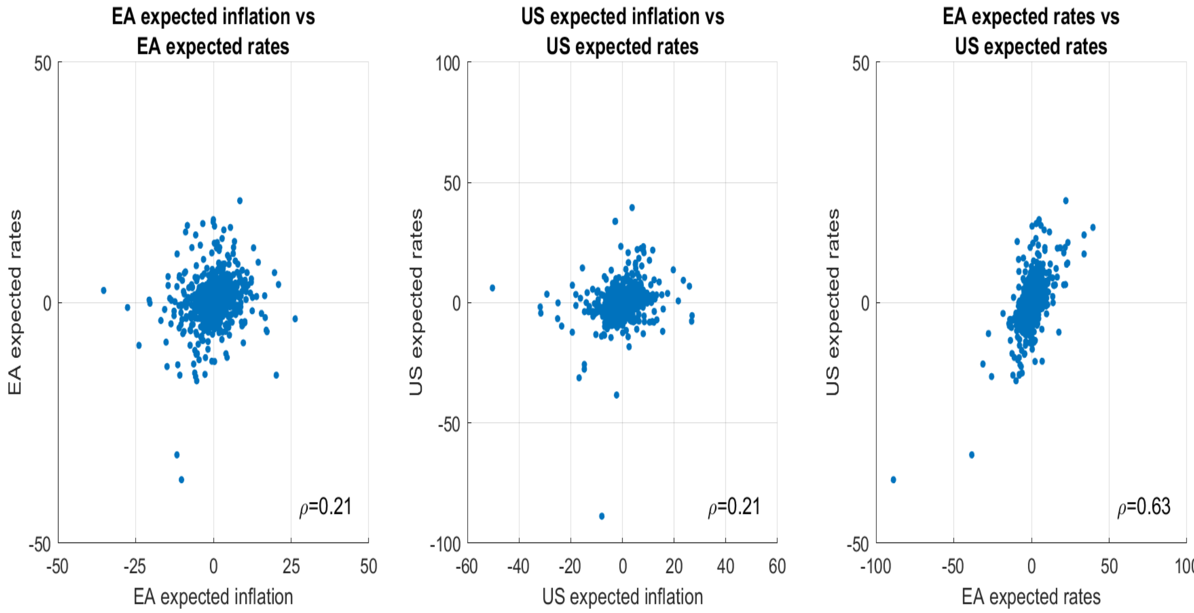
We use a daily Vector Autoregressive (VAR) model to capture the dynamic feedback between domestic and foreign variables. Specifically, we set up the following model:

$$y_t = c + A(L)y_{t-1} + u_t \tag{2}$$

where y is a vector of endogenous variables, c denotes a vector of constant terms, and u is a vector of residuals. $A(L)$ is a matrix polynomial in the lag operator L, and t denotes the time frequency, which in our setting is daily (weekdays).

The vector y of endogenous variables is structured into two main blocks: one for euro area and one for United States, each containing three variables. Drawing on the literature that identifies shocks through financial data (e.g., Jarociński and Karadi, 2020), these capture interest rates, inflation compensation, and stock prices, serving as the financial-market counterparts of the New Keynesian model variables. First, we incorporate our measure of revisions in policy rate expectations, as detailed in the

Figure 4. Stylized facts on revisions in expected rates in the post-pandemic monetary cycle



Notes. The figure shows correlations among key variables. The left (center) panel shows the correlation between daily changes in euro-area (US) inflation expectations and daily revisions in expected ECB (Fed) policy rates, with all series expressed in basis points and defined as in Section 2.1. The right panel shows the correlation between daily revisions in expected Fed rates and daily revisions in expected ECB rates. The bottom-right corner of each panel reports the correlation coefficient between the two variables shown.

previous section. Second, we include the 1-year-1-year Inflation-Linked Swap (ILS) forward rate as a market-based measure of medium-term inflation expectations.[7] Third, we include the EURO STOXX equity index for the euro area and the S&P 500 for the United States. The inflation and equity variables are sampled at a daily frequency from Bloomberg and LSEG.

Figure 4 shows some stylized facts about the relationship between our variables of interest.[8] Revisions in expected policy rates for both the ECB (left panel) and the Fed (center panel) exhibit a mild positive correlation with changes in market-based inflation expectations in their respective countries. This pattern suggests that these revisions were primarily driven by demand and supply shocks – rather than monetary policy shocks, which would imply a negative correlation – highlighting the importance of systematic monetary policy. In addition, the right panel shows that daily revisions in expected policy rates are positively correlated across the two economies at the daily frequency. This suggests that near-term policy rate expectations cannot be fully understood from a purely domestic perspective, as they

[7]This choice is motivated by two considerations. First, both the ECB and the Fed target inflation over a medium-term horizon. Second, forward rates (e.g., 1-year, 1-year rates) mitigate the fixed-base indexation bias affecting euro-area ILS spot rates (e.g., 2-year rates). This bias can generate "spurious" jumps in spot rates on the first day of each month, particularly at the short end of the term structure. While negligible in a low-inflation environment, the effect became very pronounced in the post-pandemic period (Bernardini et al., 2024).

[8]Figure A1 in the Appendix provides an overview of the data and additional reduced-form correlations.

likely also reflect the influence of external shocks.

While the evidence in Figure 4 provides useful preliminary insights, it remains partial. The positive correlation between expected policy rates and expected inflation highlights the role of systematic monetary policy responses to macroeconomic shocks, but it does not distinguish between demand- and supply-driven influences, nor does it indicate the extent to which monetary policy shocks contributed. Similarly, the observed co-movement between ECB and Fed rate expectations points to external influences, though it does not identify their precise source. This co-movement may reflect cross-country spillovers – either symmetric or primarily originating from one currency area – or common global shocks. Addressing these questions, and more precisely identifying how markets interpret the reaction functions of the ECB and the Fed, requires a structural identification, which is presented in the following subsection.[9]

2.3 Daily shock identification

We apply sign and magnitude restrictions to identify both the nature and the geographic location of the shocks. The standard identification problem in VARs involves defining a matrix B such that the model residuals u_t can be expressed as a linear combination of shocks ε_t, that is, $u_t = B\varepsilon_t$. The restrictions used to identify the matrix B are outlined in Table 1. All restrictions are imposed on impact only, meaning that they apply solely on the day in which a given shock occurs.

The nature of the shocks is identified through the co-movements among domestic variables.[10] A tightening monetary policy shock is characterized by rising expected policy rates, leading to lower expected inflation and declining stock prices. An expansionary demand shock results in increases in both expected inflation and stock prices, which drive up expected policy rates. Supply shocks are characterized by rising expected inflation and declining stock prices, which leads to higher expected policy rates.

The geographic location of the shocks is identified by assuming that domestic shocks generate larger revisions in domestic policy rates compared to foreign shocks. Specifically, euro-area shocks are assumed to lead to stronger absolute revisions on expected ECB rates, reflecting their greater influence on local market conditions. Analogously, US shocks are assumed to have a more pronounced effect on US rate expectations. Notably, the responses of domestic variables to foreign shocks are left fully unrestricted for both currency area. This is a key feature of our approach, which allows us to remain neutral on the existence and nature of cross-border spillover effects in policy rate expectations, maintaining a

[9] The baseline model is designed to account for potential cross-border spillovers, while the role of global shocks – which, at a daily frequency, can largely be interpreted as systematically driven by commodity price fluctuations – is examined in the robustness analysis through an extension of the baseline model (Section 4).

[10] For ease of exposition, and in line with Table 1, we illustrate shocks that raise expected policy rates. All sign restrictions reverse for shocks of the opposite sign.

Table 1. Daily shock identification

	EA Shocks			US Shocks		
	MonPol	Demand	Supply	MonPol	Demand	Supply
	Magnitude restrictions					
$\lvert\Delta\tilde{i}^{EA}\rvert - \lvert\Delta\tilde{i}^{US}\rvert$	+	+	+	-	-	-
	Sign restrictions					
$\Delta\tilde{i}^{EA}$	+	+	+			
$\Delta\pi^{EA}$	-	+	+			
Δs^{EA}	-	+	-			
$\Delta\tilde{i}^{US}$				+	+	+
$\Delta\pi^{US}$				-	+	+
Δs^{US}				-	+	-

Notes. The table summarizes the sign and magnitude restrictions imposed on the responses of the analyzed variables to the shocks. All restrictions apply on impact, meaning they must hold only on the day the shock occurs. Blank entries indicate unrestricted responses. Sign restrictions are illustrated for shocks that raise expected policy rates (e.g., a tightening monetary policy shock); all signs reverse for shocks of the opposite sign. Magnitude restrictions, by contrast, are independent of the sign of the shocks, as they are based on the absolute values of the responses.

completely agnostic stance.

Three clarifications about the identification are in order. First, to address concerns about the potential influence of global shocks (i.e., shocks that are not specific to a currency area but are related to global markets), we control for commodity price indexes in the robustness section of this paper. This introduces a global component into the model, allowing us to test the reliability of the baseline specification. Second, the assumption that stock prices rise in response to demand shocks may be contentious, as it depends on whether the positive effect of higher expected cash flows from aggregate activity outweighs the negative effect of a higher discount factor. Following the literature (Jarociński and Karadi, 2020; Cieslak and Pang, 2021), we assume that the cash flow channel dominates, leading to a positive stock price response. Nevertheless, we introduce a robustness check where we substitute broad equity indices with equity indices of cyclical stocks, the latter being more closely correlated with the business cycle. Third, the assumption that interest rates systematically respond to supply shocks is motivated by the fact that an increase in the 1-year-1-year ILS rate reflects a rise in medium-term rather than short-term inflation, as also discussed in Jarociński and Karadi (2020) and De Santis and Zimic (2022).

2.4 Specification, estimation, and inference

The estimation sample spans February 2022 to December 2024. The starting date is chosen to coincide with the onset of volatility in both euro-area and US short-term interest rates following the end of the

ELB period. The model is specified with four lags. Consistent with our time series of daily revisions in expected policy rates, all other variables are expressed in differences. Specifically, inflation swap rates enter in first differences, while stock price indices are specified in log differences, which correspond to daily equity returns. All observations are retained, with Section 4 analyzing sensitivity to the extreme movements related to the SVB event.

The model is estimated using Bayesian methods under a conjugate Normal-Wishart prior with Minnesota-type hyperparameters elicited in a standard manner except for the shrinkage parameter on the constant, which is set very tightly around its zero mean.[11] The relatively high tightness of this prior ensures that the posterior estimate of the deterministic component remains close to zero, as it would be in a longer sample where upward and downward revisions tend to offset each other. In our relatively short sample, upward revisions dominate.[12] Without this tight shrinkage, the posterior estimate of the unconditional mean would be positive, which would be inconsistent with the theoretical properties of financial variables. For robustness, we also consider a specification with a looser prior on the constant. Sign and magnitude restrictions are implemented using the algorithm discussed in Rubio-Ramirez et al. (2010). All results reported in the following sections are based on 1,000 retained draws.

3 The post-pandemic evidence

The analysis proceeds in three steps. First, it assesses the perceived responsiveness of policy rates to inflation, allowing us to evaluate whether markets revise policy rate expectations differently depending on whether inflation is driven by demand or supply shocks. Second, it examines the sensitivity of foreign policy rate expectations to domestic ones, highlighting the presence and nature of cross-border spillovers. Third, it decomposes the observed revisions in expected ECB and Fed rates during the post-pandemic monetary policy cycle, quantifying the contributions of monetary policy, demand (excluding monetary policy), and supply shocks, while distinguishing between domestic and foreign sources.

3.1 Perceived responsiveness to demand- and supply-driven inflation

Did markets expect central banks to respond differently to inflation depending on its source – whether demand- or supply-driven? Standard monetary theory predicts such a differential response: supply-driven inflation generally calls for greater caution than demand-driven inflation, given the trade-off it induces between inflation and output stabilization. (Erceg et al., 2000; Bodenstein et al., 2008; Guerrieri

[11] The prior mean vector is set to zero. This specification is equivalent to assuming that the level variables follow a random-walk process, implying that their daily changes are white noise. Regarding the shrinkage of the prior parameters, we set an overall tightness parameter of 0.1, a cross-variable variance parameter of 0.5, a lag-decay coefficient of 1, and a tightness of 0.1 on parameters associated with deterministic terms. The prior for the orthonormal rotation matrix is assumed to be uniform.

[12] This is reflected in the positive means reported in the last two rows of Table A1 in the Appendix.

et al., 2023).[13] This muted response to supply shocks, however, is conditional on well-anchored inflation expectations. If de-anchoring risks materialize, central banks may need to act more decisively to prevent self-fulfilling inflation spirals and safeguard their credibility, irrespective of the inflation source (Kamps et al., 2025). The post-pandemic period is particularly notable in this regard, as inflation reached levels not seen since the 1970s, raising tangible risks of expectations becoming unanchored.

To investigate this, we estimate the perceived responsiveness of policy rates to inflation under both demand and supply shocks. For each shock type, we define:

$$\eta\left(\frac{\tilde{i}^d}{\pi^d}\middle|h,\varepsilon^{d,k}\right)=\frac{\sum_{j=0}^{h} IRF(\Delta\tilde{i}^d, j, \varepsilon^{d,k})}{\sum_{j=0}^{h} IRF(\Delta\pi^d, j, \varepsilon^{d,k})} \tag{3}$$

where the numerator captures the impulse response of the expected domestic policy rate $\tilde{i}^d$, h days after a shock $\varepsilon^{d,k}$ of type k originating in currency area d, and the denominator reflects the corresponding response of inflation expectations π^d. We set $h = 10$ (two weeks) and compute this object for both demand and supply shocks, $k \in \{\text{DEM}, \text{SUP}\}$, originating in both the euro area and the United States, $d \in \{\text{EA}, \text{US}\}$. Moreover, to summarize the perceived *relative* responsiveness to demand-driven inflation (i.e., relative to supply-driven one), we compute:

$$\frac{\eta_{DEM}}{\eta_{SUP}}=\frac{\eta\left(\tilde{i}^d/\pi^d\middle|h=10,\varepsilon^{d,DEM}\right)}{\eta\left(\tilde{i}^d/\pi^d\middle|h=10,\varepsilon^{d,SUP}\right)} \tag{4}$$

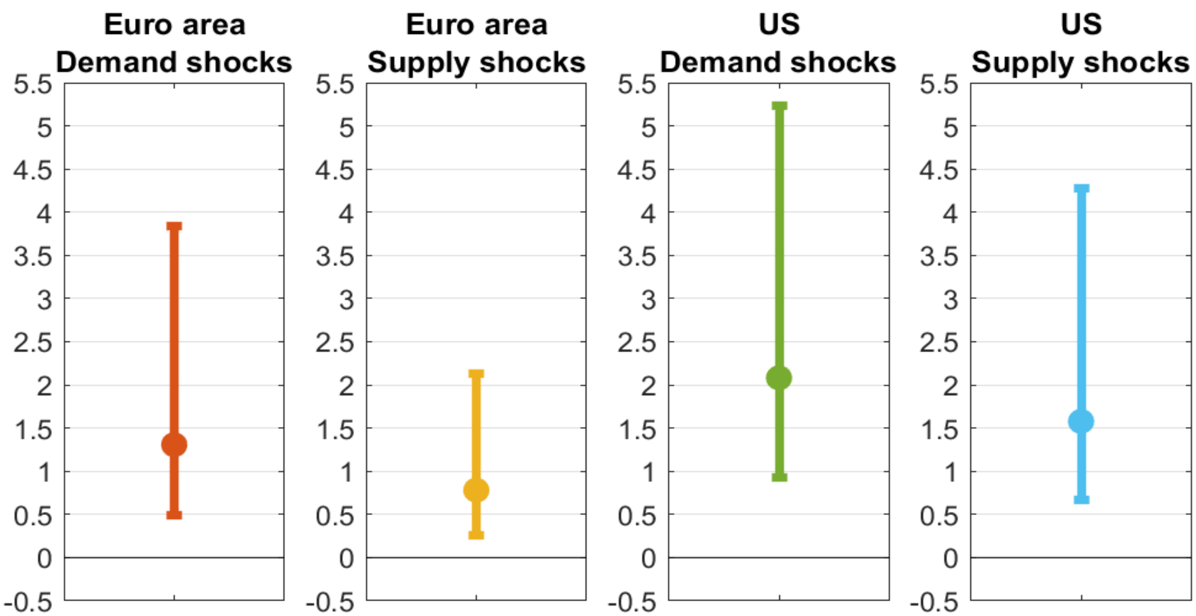
where $\eta_{DEM}/\eta_{SUP} > 1$ indicates a stronger perceived response to demand-driven inflation. Figure 5 reports the posterior distribution of η from eq. (3), while Table 2 presents both median of the posterior distribution of $\frac{\eta_{DEM}}{\eta_{SUP}}$ from eq. (4), as well as the share of posterior draws exceeding one.[14]

The main finding is that markets anticipated only limited differentiation in expected policy responses during the post-pandemic monetary cycle, with supply shocks largely perceived as being treated nearly on par with demand shocks. On the one hand, Figure 5 shows that markets expected both the ECB and the Fed to respond slightly more strongly to demand-driven inflation than to supply-driven inflation, in line with theoretical predictions and historical evidence from advanced economies (Hofmann et al., 2024a,b). On the other hand, Table 2 clearly shows that this discrimination was modest: median estimates indicate that the perceived policy response to demand-driven inflation was roughly 1.2 times

[13] Although central banks differ in the weight they place on output relative to inflation stabilization in their loss functions, any nonzero weight on output tends to produce differential responses to demand- and supply-driven inflation.

[14] The full set of underlying impulse responses is reported in Figure A2 in the Appendix. Impulse responses stabilize within a few trading days after impact and effectively reach their long-run values by $h = 10$.

Figure 5. Perceived responsiveness to demand- and supply-driven inflation



Notes. The figure displays estimates of the perceived responsiveness of policy rates to inflation under both demand and supply shocks, as defined in eq. (3). The perceived responsiveness can be interpreted as the expected change in monetary policy rates resulting from a unit increase in inflation due to a specific shock. Dots represent the medians of the posterior distributions, while whiskers indicate 68% credible intervals.

Table 2. Perceived *relative* responsiveness to demand-driven inflation

	EA	US
$\text{Med}(\eta_{DEM}/\eta_{SUP})$	1.23	1.15
$\text{Prob}(\eta_{DEM}/\eta_{SUP} > 1)$	*0.55*	*0.54*

Notes. The table reports estimates of the perceived *relative* responsiveness of monetary policy rates to demand- and supply-driven inflation, as defined in eq. (4). A *relative* responsiveness greater than one indicates that markets perceive central banks as responding more aggressively to demand-driven inflation than to supply-driven inflation. The first row presents the medians of the posterior distributions, while the second row shows the share of draws exceeding one.

as strong as that to supply-driven inflation, with only about 55% of posterior draws exceeding one, indicating limited support for a stronger perceived response to demand-driven inflation. Section 5 contrasts these patterns with the pre-ELB period, when inflation rates were closer to central banks' targets, providing additional context.

3.2 Cross-border spillovers in policy rate expectations

Did revisions in policy rates induce cross-border adjustments in expected policy rates in other currency areas? If so, how large were these spillovers, to what extent were they symmetric across currency areas, and under which types of shocks did they emerge? Previous studies document positive spillovers from US monetary policy to other advanced economies (Kalemli-Özcan, 2019; Cesa-Bianchi and Sokol, 2022; Georgiadis and Jarociński, 2025), although estimates differ in magnitude. Evidence on euro-area spillovers to the United States is more limited, with some research suggesting that euro-area information shocks – interpretable as demand shocks emerging during monetary policy events – can generate modest effects on US rates (Jarociński, 2022). While providing valuable insights, these findings remain restricted to specific shocks or countries, and a systematic – comprehensive – analysis of spillovers to short-term rates across currency areas and shock types is still lacking.

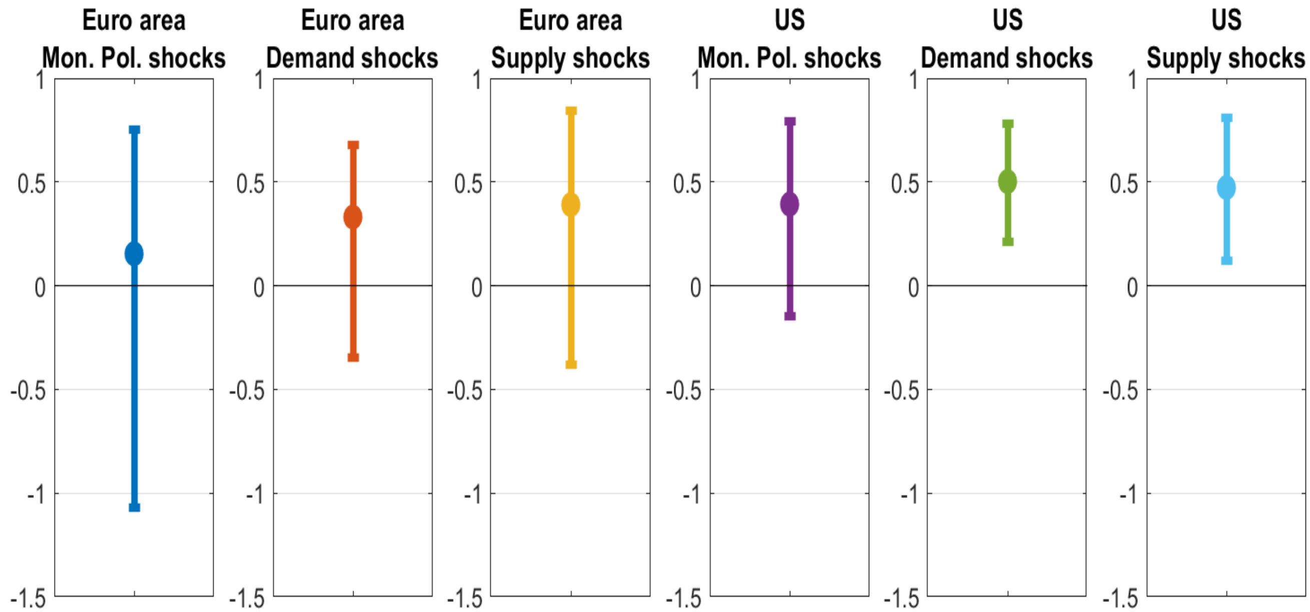
To address this gap, we compute the sensitivity of expected foreign policy rates to expected domestic policy rates as follows:

$$\theta\left(\frac{\tilde{i}^f}{\tilde{i}^d}\middle| h, \varepsilon^{d,k}\right) = \frac{\sum_{j=0}^{h} IRF(\Delta\tilde{i}^f, j, \varepsilon^{d,k})}{\sum_{j=0}^{h} IRF(\Delta\tilde{i}^d, j, \varepsilon^{d,k})} \tag{5}$$

where the numerator captures the impulse response of the expected foreign policy rate $\tilde{i}^f$, h days after a shock $\varepsilon^{d,k}$ of type k originating in domestic country d, and the denominator reflects the response of the expected domestic policy rate $\tilde{i}^d$ to the same shock. We set $h = 10$ (two weeks) and compute this object for monetary policy shocks, demand shocks and supply shocks, $k \in \{\text{MP}, \text{DEM}, \text{SUP}\}$, originating in both the euro area and the United States, $d \in \{\text{EA}, \text{US}\}$ and $f \in \{\text{US}, \text{EA}\}$. Figure 6 displays the estimated elasticities, which can be interpreted as spillover effects. Specifically, the first three columns report how expected Fed rates respond to a 1 percentage point revision in expected ECB rates following a euro-area shock, while the last three columns show the extent to which expected ECB rates are revised in response to a US shock that leads to a 1 percentage point revision in expected Fed rates.

Two key findings emerge from the analysis. First, interest rate spillovers were notably asymmetric across the Atlantic. Revisions in Fed rate expectations systematically led to sizable revisions in ECB rate expectations. A 1 percentage point revision in US rate expectations led to, on average, a 0.5 percentage point revision in ECB rate expectations. In contrast, spillovers from euro-area shocks were smaller in magnitude (around 0.3 on average) and their estimates are more uncertain (the credibility intervals are wider and include the zero). Second, interest rate spillovers depended on the nature of the shock. Monetary policy shocks produced weaker spillover effects: their magnitude was smaller than that associated with demand- or supply-driven shocks, and their estimates are more uncertain. This suggests that revisions in rate expectations driven by perceptions of a systematic monetary policy response to changes in economic outlook had a greater international impact than those driven by perceptions of discretionary actions.

Figure 6. Sensitivity of expected foreign policy rates to expected domestic policy rates



Notes. The figure displays estimates of the sensitivity of expected foreign policy rates to expected domestic policy rates under monetary policy, demand and supply shocks, as defined in eq. (5). The sensitivity can be interpreted as the expected change in foreign monetary policy rates following a unit increase in domestic monetary policy rates triggered by a domestic shock. Dots represent the medians of the posterior distributions, while whiskers indicate 68% credible intervals.

While these findings provide new insights into the international transmission of short-term rates, particularly highlighting the role of the systematic component of US monetary policy in driving cross-border spillovers, they also corroborate earlier evidence. Regarding US spillovers on the short-term rates of advanced economies, our results align more closely with Kalemli-Özcan (2019), who finds a 0.5 spillover effect of US monetary policy shocks on the short-term rates of advanced economies. Regarding euro-area spillovers on US short-term rates, while we also find similar qualitative evidence to Jarociński (2022), our estimated effects are weaker in terms of statistical precision.

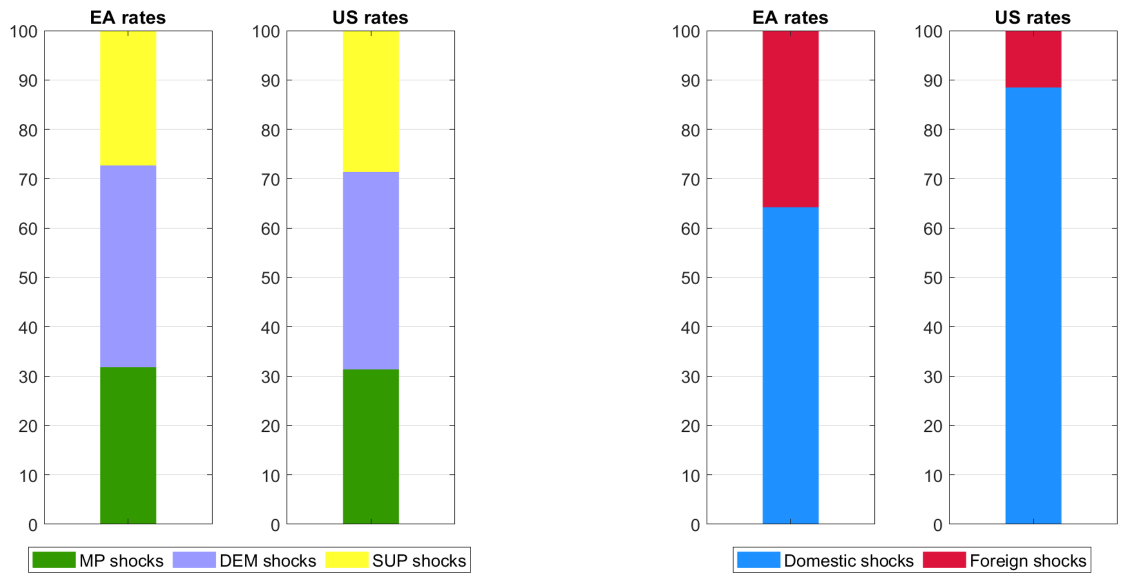
3.3 Drivers of policy rate expectations

Given the results from the previous sections, two questions arise. How much did the different types of shocks contribute to revisions in rate expectations during the post-pandemic monetary cycle? How much of the observed revisions in ECB rate expectations could be attributed to revisions in US rate expectations? Figure 7 illustrates the average contribution of the identified shocks to the observed revisions in expected policy rates aggregated by the nature of the shock – panel (a) – and by the geographic location of the shock – panel (b).[15] Within each panel, left bars focus on euro-area policy rates, while

[15]The full forecast error variance decompositions (FEVDs) on impact for all shocks and variables are reported in Figure A3 in the Appendix.

Figure 7. Average shock contribution to revisions in rate expectations

(a) Aggregation by type of shock (b) Aggregation by geographic location



Notes. The figure shows the estimated average contributions of domestic and foreign shocks to the volatility of revisions in expected ECB and Fed rates, by means of Forecast Error Variance Decompositions (FEVDs) evaluated on impact. Panel (a) groups contributions by shock type: green bars sum the contributions of monetary policy shocks (i.e., domestic and foreign), violet bars sum the contributions of demand shocks, and yellow bars sum the contributions of supply shocks. Panel (b) groups contributions by geographic location: blue bars sum the contributions of all domestic shocks (i.e., monetary policy, demand, and supply), and red bars sum the contributions of all foreign shocks.

right bars examine revisions in US policy rates.

Panel (a) of Figure 7 shows that, during the post-pandemic monetary cycle, revisions in expected policy rates were largely driven by the anticipated systematic response of monetary policy to fundamental shocks – namely, demand and supply shocks – rather than by unsystematic monetary policy actions. The latter, captured by monetary policy shocks, accounted for no more than 30% of the observed revisions in both the euro area and the United States. Despite the particularly forceful monetary policy response by the Fed and the ECB to the post-pandemic inflation surge, the influence of unsystematic policy actions remained relatively limited. This suggests that financial markets largely anticipated central banks' responses to fundamental shocks and were not consistently surprised by their actions or announcements.

Panel (b) of Figure 7 further shows that during the post-pandemic monetary cycle, not only did US spillovers lead to sizable revisions in ECB rate expectations, as shown in the previous section, but also they accounted for a substantial proportion of these revisions. Specifically, US shocks explain nearly 40% of the revisions in ECB rate expectations in our sample. In contrast, euro-area shocks contributed only around 10% to the variation in US rate expectations, highlighting a clear and robust asymmetry in contributions. To the best of our knowledge, we are the first to document the significant role of US spillovers in systematically shaping near-term expectations of policy rates in the euro area, the second-largest currency area after the United States.

Do these average shock contributions hide peculiar patterns over time? To explore this, Figure 8 plots the contribution of foreign and domestic shocks to the revisions in ECB and Fed rate expectations over the sample period. The black lines in the top panels show the cumulative revisions from the start of the sample and the areas represent the cumulative contribution of the different shocks. Similarly, the dots in the bottom panels represent cumulative revisions by year and the bars indicate the shock contribution.

We document that the large and repeated upward revisions in policy rate expectations during the post-pandemic monetary cycle unfolded in clearly distinguishable phases. Supply-side shocks drove positive rate revisions in 2022, in tandem with the surge in energy prices following the Russian invasion of Ukraine at the beginning of that year. Cost-push pressures then eased in 2023 and 2024, amid easing supply-side constraints and falling energy prices. Monetary policy shocks contributed mainly in 2022, coinciding with the exceptionally aggressive tightening by both the ECB and the Fed during the summer of that year, which was partly aimed at preventing a de-anchoring of inflation expectations. Demand shocks played a prominent role throughout the entire sample period, though their effects varied significantly across the two currency areas. In 2024, weak euro-area demand exerted downward pressure on expected policy rates, while strong US demand supported higher expected Fed rates. Consequently, spillovers from US demand shocks helped sustain positive revisions in expected ECB rates during 2023 and 2024, despite domestic euro-area conditions that would have otherwise implied negative revisions.

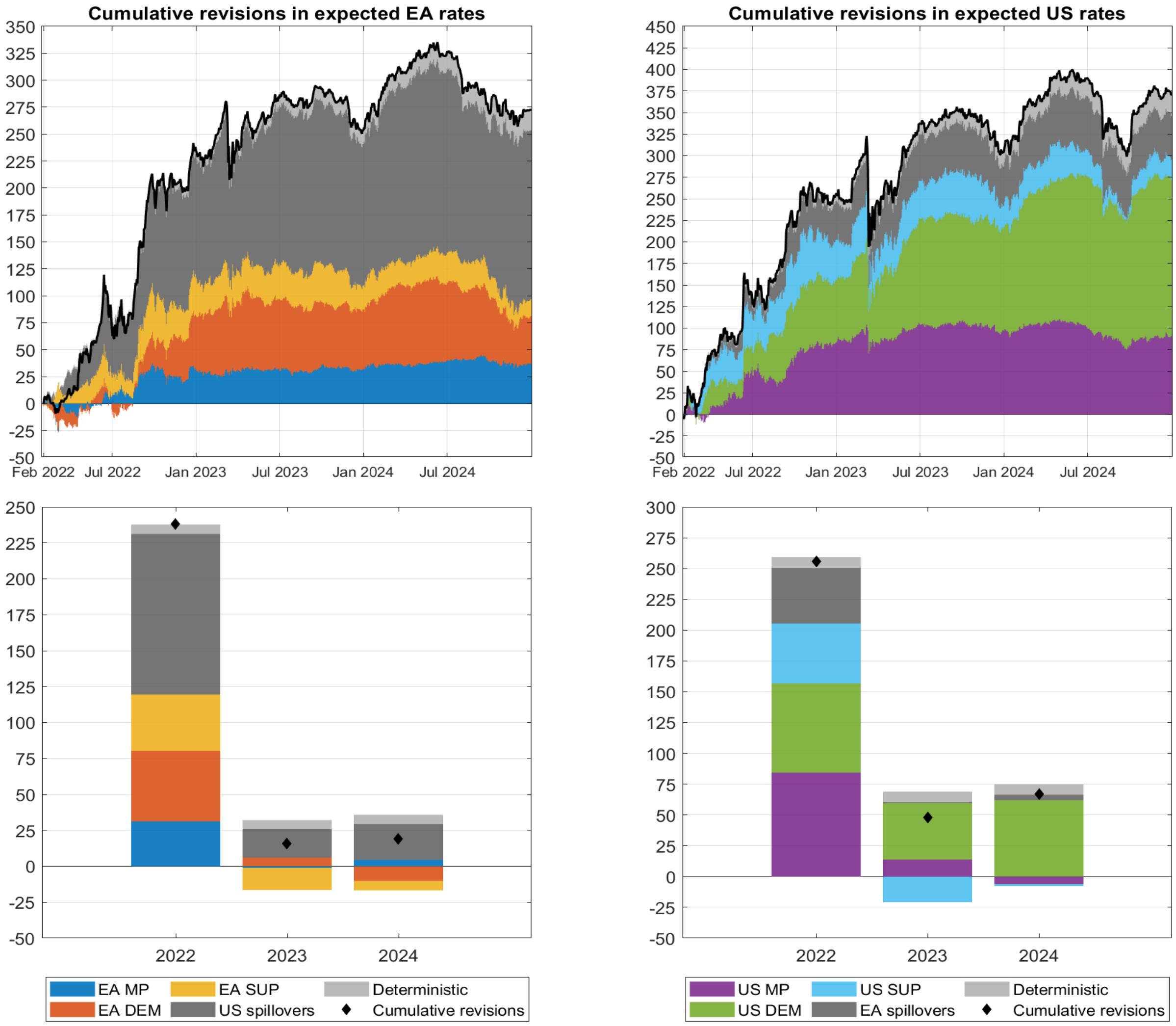
4 Robustness

This section deals with potential concerns stemming from the model specification, examines the the presence of time-variation, and compares the monetary policy shocks identified with our methodology with those identified using intraday changes in financial variables around monetary policy events.

4.1 Sensitivity analysis

Figure 9 compares the results reported in Sections 3.1 and 3.2 with those elaborated under different model setups. The comparison between the results reported in Section 3.3 and those obtained under different specifications are reported in Figure A4 in the Appendix.

Figure 8. Shock contribution to revisions in rate expectations over time



Notes. The figure illustrates the estimated contribution of domestic and foreign shocks to the revisions in expected ECB and Fed rates (expressed in basis points), by means of Historical Decompositions (HDs). Top panels show the contributions to the cumulative revisions from February 2022 to December 2024. Bottom panels show the same contributions cumulated by year.

Energy prices. One strength of our model is its ability to capture country-specific shocks, including monetary, demand, and supply shocks. However, global shocks – especially those related to commodity prices – may not be fully accounted for in this framework, as they are only indirectly specified. To test the robustness of our results, we include two commodity prices (the logarithms of Brent crude oil and of Dutch TTF natural gas prices), along with their respective lags, as exogenous variables. The results outlined in the paper remain consistent, suggesting that our methodology for identifying shocks does not systematically assign commodity-related shocks to either currency area. This indicates that: (i) our baseline identification scheme is effective, on average, in assigning shocks to the currency area where they occurred and (ii) explicitly accounting for global shocks in the identification scheme would not materially affect the main results. We do not adopt this specification as the baseline, since commodity prices are themselves endogenous to the global macroeconomic environment; a proper treatment of their role would require a more tailored framework (see, e.g., Gazzani et al., 2024), which lies beyond the scope of this paper.

SVB dummies. Our sample includes the days around the SVB collapse in March 2023, which feature the largest single-day moves in our measures of daily revisions in policy rate expectations. These moves were also unusually large relative to typical daily changes, which could introduce nonlinearities in the model or disproportionately influence posterior estimates. To assess the robustness of our results to these extreme events, we introduce dummy variables for the period when risk-off sentiment in financial markets was most pronounced. Specifically, we include one exogenous dummy for 10 March 2023 – the day SVB failed – and one dummy for each of the following four trading days, in line with the lag structure of our model.[16] The results of this alternative specification indicate that, in the baseline model, the effects of the 2023 banking turmoil are effectively captured by US demand shocks. Importantly, the evidence reported in sections 3.1 and 3.2 remains robust when controlling for these extreme days.

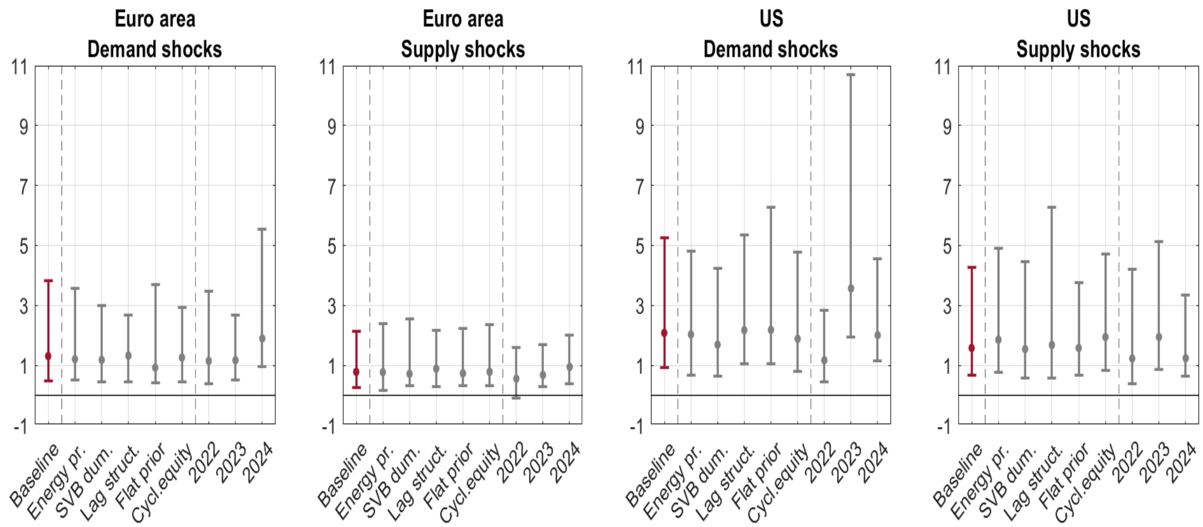
Lag structure. The baseline model employs a parsimonious lag structure, reflecting the theoretical assumption that – under a random-walk specification of the level variables – past changes in market data should provide no additional information about current changes (i.e., in principle, no lags are required). In practice, however, one may wonder whether this choice unduly affects the results. To address this concern, we re-estimate the model using an extended 25-day lag structure instead of the baseline 4-day specification. The results remain largely unchanged, suggesting that the parsimonious lag structure is sufficient to capture the system's dynamics without compromising the identification of shocks or the reliability of impulse responses.

Flat prior. In the baseline model, we apply a tight shrinkage around a zero-mean prior for the constant to ensure that the posterior estimate remains close to zero, despite the predominance of upward revisions in expected policy rates. This imbalance arises because our relatively short sample does not cover a full tightening and easing cycle, over which positive and negative revisions would likely offset each other, yielding an approximately zero unconditional mean. The tight shrinkage is crucial for performing a meaningful historical shock decomposition, as shown in the previous section. To relax this assumption, we also re-estimate the model using a flat prior for the constant. The results remain broadly consistent with those of the baseline specification.

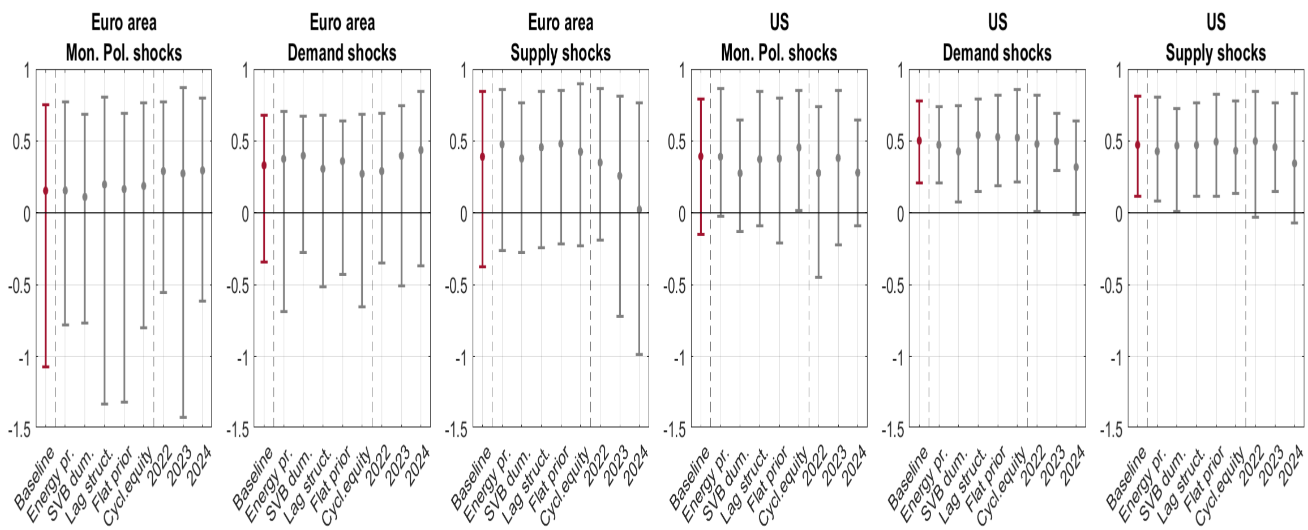
[16] One of these dummies also coincides with 15 March 2023, marking the start of turmoil at Crédit Suisse, the second-largest Swiss lender, which was eventually acquired by UBS.

Figure 9. Sensitivity analysis

(a) Perceived responsiveness to demand- and supply-driven inflation



(b) Sensitivity of expected foreign policy rates to expected domestic policy rates



Notes. The figure replicates results reported in figure 5 and 6 under alternative specifications of the model. Panel (a) shows estimates of the perceived responsiveness of policy rates to inflation under both demand and supply shocks, as defined in eq. (3). Panel (b) shows estimates of the sensitivity of expected foreign policy rates to expected domestic policy rates under monetary policy, demand, and supply shocks, as defined in eq. (5). Each column corresponds to a different specification of the model (the first column, marked in red, displays the estimates of the baseline model already presented either in Figure 5 or in Figure 6. Dots represent the medians of the posterior distributions, while whiskers indicate 68% credible intervals.

Cyclical equity. The baseline model proxies expectations for economic activity with generic stock price indices for the euro area (EURO STOXX) and for the United States (S&P 500). However, these indices may be disproportionately influenced by a few large companies, whose performance is not representative of the macroeconomy. To address this concern, we use MSCI indices of cyclical stocks, which reflect a subsample of stocks whose returns are more closely correlated with the business cycle. We find that the results are virtually unchanged compared to those of the baseline model.

4.2 Subsample analysis

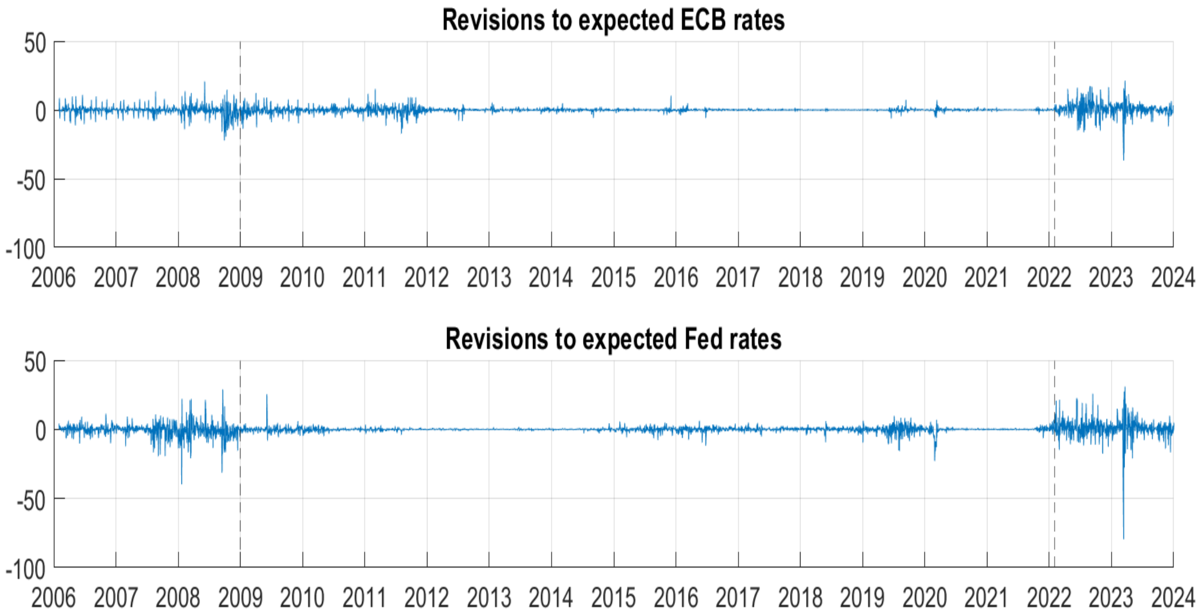
The post-pandemic monetary cycle offers substantial variation in financial market data, allowing our model to disentangle different types of shocks. However, distinct economic and financial regimes during this period may produce notable differences in observed responses. For example, the 2023 banking turmoil in the United States triggered a temporary but pronounced reassessment of market expectations regarding the ECB's and Fed's tightening cycles; this episode was addressed in the sensitivity check discussed in the previous section. Another example is 2022, when policy rate expectations were particularly volatile compared to subsequent years, largely due to the Russian invasion of Ukraine, which caused a sharp spike in gas prices and a corresponding surge in inflation expectations. Building on these observations, we examine yearly subsamples, estimating the model parameters using data from each year separately and computing elasticities and average shock contributions based on the resulting estimates. The results of these three annual models are displayed in Figures 9 and A4 in the Appendix.

While the main takeaways from sections 3.1, 3.2, and 3.3 remain robust, several noteworthy differences emerge across the years. In 2022, monetary policy shocks account for a larger share of the volatility in interest rate expectation revisions for both economies (Figure A4) compared to the baseline model, consistent with both central banks surprising markets with substantial rate hikes that year. In 2023, the perceived responsiveness of the Federal Reserve to US demand shocks is significantly higher than in 2022 and 2024 (Figure 9), reflecting market expectations that the Fed would slow the pace of rate increases in response to financial instability, consistent with the SVB robustness check discussed earlier. In 2024, US-to-euro-area interest rate spillovers appear smaller than in the previous two years (Figure 9), while the estimated sensitivity of expected policy rates to inflation under euro-area demand shocks is higher. This pattern suggests that markets expected the ECB to adopt a more accommodative stance in response to weak domestic demand, despite continued strength in US demand conditions.

4.3 Comparison with other measures of monetary policy shocks

An interesting question is how the monetary policy shocks identified by our framework compare with those obtained using established methodologies in the literature. A growing body of work identifies monetary policy shocks by exploiting intraday price movements around policy events, such as press releases and press conferences (Altavilla et al., 2019; Jarociński and Karadi, 2020; Istrefi et al., 2024; Bauer and Swanson, 2023; Altavilla et al., 2025). While our approach is broader and not designed to isolate monetary policy shocks exclusively, this comparison provides a useful benchmark to gauge the plausibility of our identification, even though differences in frequency and underlying financial market prices make the comparison necessarily approximate.

Figure 10. Daily revisions in market expectations of ECB and Fed rates since 2006



Notes. The figure presents our market-based measure of daily revisions in near-term market expectations for ECB and Fed monetary policy rates measured in basis points, with both series extended back to 2006. The top panel shows daily revisions of expected ECB rates and the bottom panel daily revisions of expected Fed rates from January 2006 to December 2024. Black dashed lines mark the end of December 2008 and the beginning of February 2022, respectively.

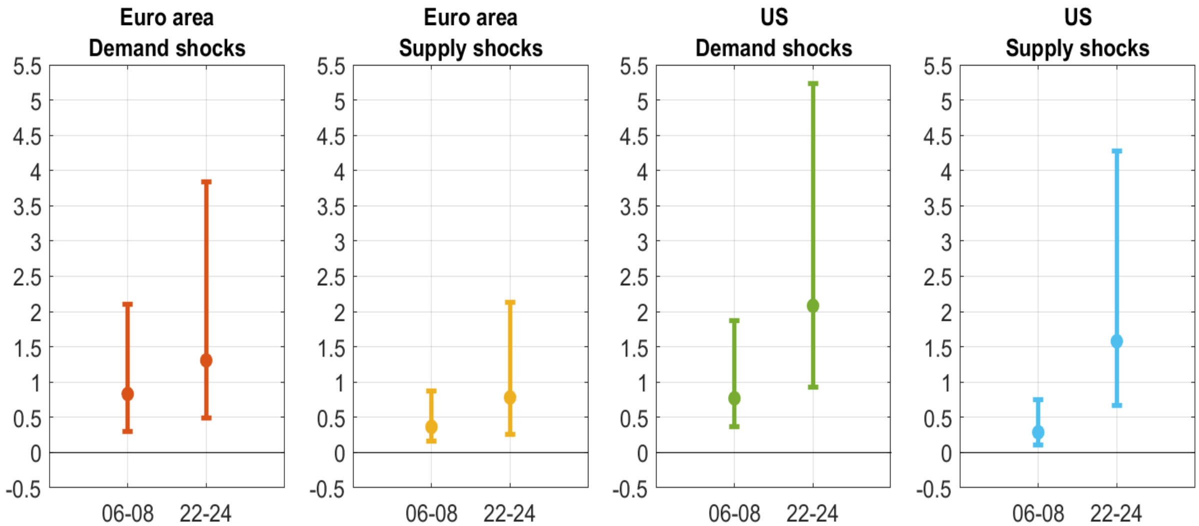
Figure A5 in the Appendix compares the shocks identified with our methodology to those reported by Jarociński and Karadi (2020), focusing on ECB Governing Council and Fed FOMC meeting dates. The figure shows a moderate to high correlation between our shocks and those obtained with state-of-the-art methods, both for the post-pandemic monetary cycle and the pre-ELB period (see Section 5 for an application of our model to an earlier sample).

5 How does the post-pandemic evidence compare to the past?

Data availability and structural shifts in monetary policy limit comparisons with earlier periods. Our dataset begins in 2006, as swap markets were insufficiently developed before then. Moreover, the 2009–2021 period was dominated by the ELB and the use of forward guidance in either the United States or the euro area, substantially limiting variation in policy rates. In turn, market-based near-term policy expectations exhibited little fluctuation during this period, complicating the identification of systematic relationships between shocks and monetary policy adjustments (Figure 10).[17]

[17] For the United States, EFFR swaps are available only since mid-2008. We therefore use EFFR futures to compute expected Fed rate revisions over the period 2006-08. To match the seven-meeting horizon in eq. (1), we use 11 consecutive monthly futures (one to twelve months ahead). In the 2022-24 post-pandemic period, the two measures are nearly identical (correlation 0.95).

Figure 11. Perceived responsiveness to demand- and supply-driven inflation (vs. pre-ELB)



Notes. The figure displays estimates of the perceived responsiveness of policy rates to inflation under both demand and supply shocks – as defined in eq. (3) – estimated using two different samples. The left column reports estimates based on the 2006–2008 sample, while the right column shows results from the baseline sample covering 2022–2024, previously presented in Figure 5. The perceived responsiveness can be interpreted as the expected change in monetary policy rates resulting from a unit increase in inflation due to a specific shock. Dots represent the medians of the posterior distributions, while whiskers indicate 68% credible intervals.

Given these constraints, the pre-ELB period from 2006 to 2008 emerges as the only viable historical benchmark.[18] Although inflation was moderately elevated during this period – peaking in the second half of 2008 at 3.0% in the United States and 3.3% in the euro area – these levels are modest compared with the post-pandemic cycle. In 2022, inflation peaked at 6.6% in the United States and 10.6% in the euro area, reaching levels not seen since the 1970s. Juxtaposing these two historical episodes therefore provides a useful lens through which to examine how policy rate expectations evolve in a high-inflation environment.

The historical comparison further reveals two distinct post-pandemic patterns. The first is a generalized increase in the perceived responsiveness to inflation, irrespective of its source. We find that the ECB and the Federal Reserve were seen as more responsive to inflation in 2022–2024 than in 2006–2008 under both demand and supply shocks (Figure 11). This result is consistent with recent reduced-form evidence documenting a stronger perceived aggressiveness to inflation during the post-pandemic monetary cycle (Bauer et al., 2024a; Cuciniello, 2024). Our contribution is to show that this greater responsiveness was not tied to any particular shock, but rather generalized across both demand and supply disturbances.

[18]The standard deviation of daily changes in expected policy rates is broadly similar across the two samples (2006-2008 and 2022-24) and considerably higher than during the period when either the ECB or the Fed operated in the vicinity of the ELB (2009–2021; see Table A1 in the Appendix).

The second pattern is an increased role of supply shocks in shaping revisions of policy rate expectations, both domestically and through cross-border effects. In the pre-ELB period, markets expected much stronger reactions to demand shocks than during the post-pandemic monetary cycle: the median estimate of perceived responsiveness to demand-driven inflation relative to supply-driven inflation was between two and three times higher (Table 3).[19] Overall, this suggests that in the post-pandemic monetary cycle, markets anticipated a much stronger reaction to supply shocks than before, not only in absolute terms but also relative to demand-driven shocks.

Table 3. Perceived *relative* responsiveness to demand-driven inflation (vs. pre-ELB)

	EA		US	
	2006-2008	2022-2024	2006-2008	2022-2024
$\text{Med}(\eta_{DEM}/\eta_{SUP})$	2.25	1.23	2.91	1.15
$\text{Prob}(\eta_{DEM}/\eta_{SUP} > 1)$	*0.68*	*0.55*	*0.75*	*0.54*

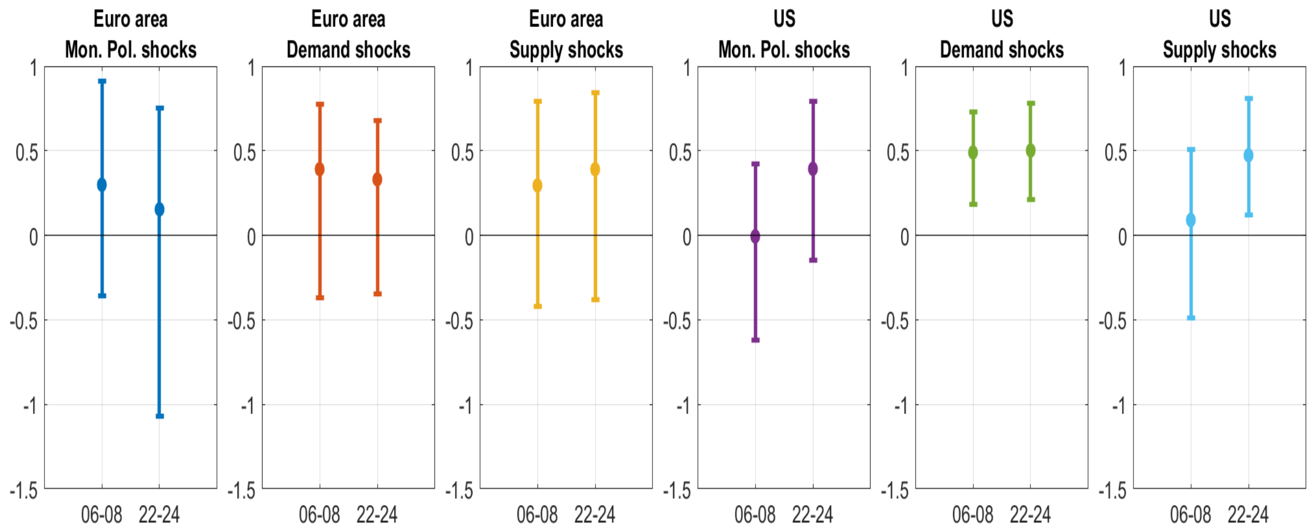
Notes. The table reports estimates of the perceived *relative* responsiveness of monetary policy rates to demand- and supply-driven inflation – as defined in eq. (4) – estimated using two different samples. Columns 2 and 4 report estimates based on the 2006–2008 sample, while columns 3 and 5 show results from the baseline sample covering 2022–2024 (previously presented in Table 2). A *relative* responsiveness greater than one indicates that markets perceive central banks as responding more aggressively to demand-driven inflation than to supply-driven inflation. The first row presents the medians of the posterior distributions, while the second row shows the share of draws exceeding one.

At the same time, US supply shocks emerged as an important driver of euro area policy rate expectations. In the pre-ELB period, only US demand shocks led to material spillovers to expected ECB rates, while US supply shocks had an almost null effect on expected ECB rates (Figure 12, last two panels). During the post-pandemic monetary cycle, instead, the effect of US supply shocks on ECB rate expectations was comparable to the one of US demand shocks. Partly as a result of these developments, we also find that the relative importance of supply shocks rose in both currency areas (Figure 13a) and the role of spillovers on expected ECB rates increased (Figure 13b). Figure 13a also highlights that monetary policy shocks played a comparatively more prominent role in shaping ECB and Fed rate expectations during the post-pandemic monetary cycle than in the pre-ELB sample. This finding aligns with the perception of a more aggressive policy stance by central banks – particularly in 2022 – against a backdrop of rising risks of inflation expectations becoming de-anchored.

Taken together, these post-pandemic patterns point to a broader reconfiguration in how markets perceive central bank reaction functions under conditions of high inflation. During the post-pandemic monetary cycle, both the Fed and the ECB were seen as placing greater emphasis on inflation control, responding more forcefully to inflation regardless of its source. A plausible interpretation is that, in

[19] The share of draws exceeding one is also substantially higher, at approximately 70%.

Figure 12. Sensitivity of expected foreign policy rates to expected domestic policy rates (vs. pre-ELB)



Notes. The figure displays estimates of the sensitivity of expected foreign policy rates to expected domestic policy rates under monetary policy, demand, and supply shocks – as defined in eq. (5) – estimated using two different samples. The left column reports estimates based on the 2006–2008 sample, while the right column shows results from the baseline sample covering 2022–2024, previously presented in Figure 6. The sensitivity can be interpreted as the expected change in foreign monetary policy rates following a unit increase in domestic monetary policy rates triggered by a domestic shock. Dots represent the medians of the posterior distributions, while whiskers indicate 68% credible intervals.

the face of persistent inflation and rising risks of de-anchoring, market participants expected central banks to prioritize price stability more decisively. This interpretation is consistent with recent evidence showing that supply shocks exhibit non-linear effects on inflation, with larger shocks or those occurring in high-inflation regimes tending to be more persistent (Bobeica et al., 2025; De Santis and Tornese, 2025).

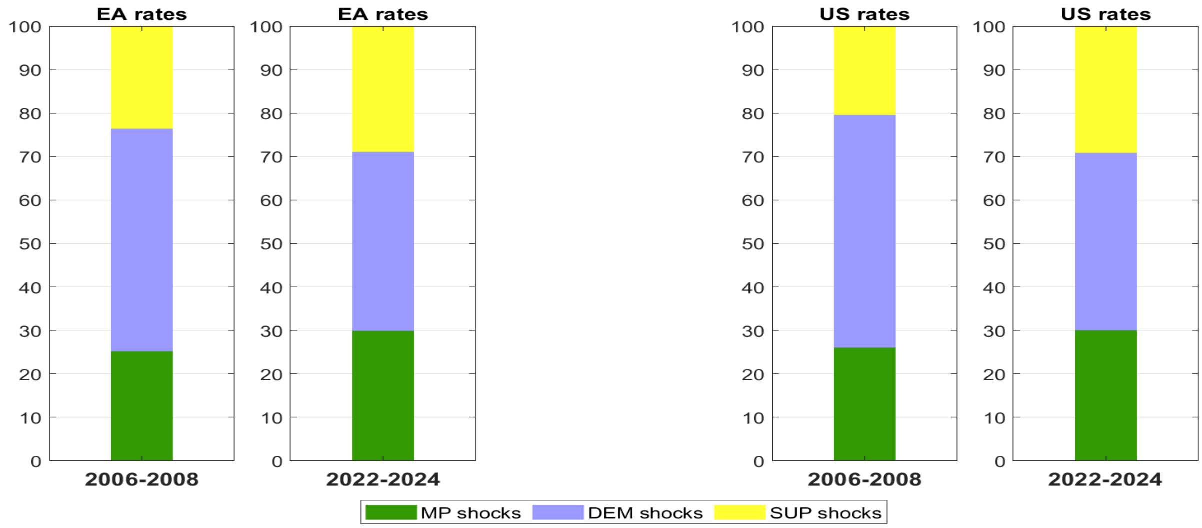
6 Conclusions

This paper has examined the drivers of revisions in ECB and Fed policy rate expectations during the post-pandemic monetary cycle. Using a novel daily, market-based measure of near-term revisions embedded in a two-country BVAR with sign and magnitude restrictions, we analyzed the role of demand and supply shocks, as well as the presence and nature of cross-border spillovers.

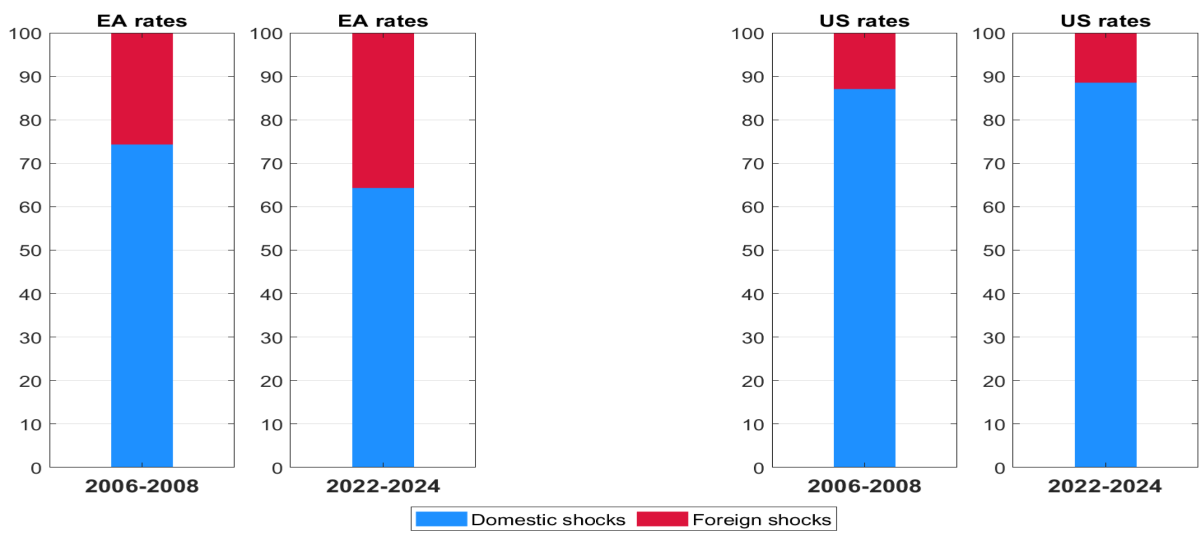
Our findings point to a reconfiguration of perceived monetary policy reaction functions under conditions of high inflation. Both the ECB and the Fed were viewed as responding more forcefully to inflation than in the pre-ELB era, with supply shocks treated more like demand shocks. This implies a lower perceived tolerance for supply-driven inflation in an environment of persistent price pressures and heightened concerns about de-anchoring. In addition, the stronger responsiveness to supply shocks was amplified by new cross-border spillovers, as US supply shocks increasingly influenced euro-area

Figure 13. Shock contribution to revisions in rate expectations (vs. pre-ELB)

(a) Aggregation by type of shock



(b) Aggregation by geographic location



Notes. The figure shows the estimated average contributions of domestic and foreign shocks to the volatility of revisions in expected ECB and Fed rates (expressed as percentage of the total volatility), by means of Forecast Error Variance Decompositions (FEVDs) evaluated on impact, under two samples. The left bar of each sub-panel refer to data from 2006 to 2008, while the right bar of each sub-panel to data from 2022 to 2024. Panel (a) groups contributions by shock type: green bars sum the contributions of monetary policy shocks (i.e., domestic and foreign), violet bars sum the contributions of demand shocks, and yellow bars sum the contributions of supply shocks. Panel (b) groups contributions by geographic location: blue bars sum the contributions of all domestic shocks (i.e., monetary policy, demand, and supply), and red bars sum the contributions of all foreign shocks.

rate expectations.

The framework developed in this paper is relevant to both scholars and policymakers. For researchers, it provides a tractable approach to studying the evolution of market perceptions of central bank reaction functions and the international transmission of shocks, and it can be readily extended to other currency areas or applied to survey-based expectations. For policymakers, it provides a flexible tool to monitor in real time the drivers of revisions in policy rate expectations – originating from the demand-side or supply-side of the economy, either domestically or abroad.

References

Altavilla, Carlo, Luca Brugnolini, Refet S. Gürkaynak, Roberto Motto, and Giuseppe Ragusa (2019) 'Measuring euro area monetary policy.' *Journal of Monetary Economics* 108, 162–179

Altavilla, Carlo, Refet Gürkaynak, Tobias Kind, and Luc Laeven (2025) 'Monetary transmission with frequent policy events.' CEPR Discussion Paper 20196, Centre for Economic Policy Research, May

Bauer, Michael D., and Eric T. Swanson (2023) 'An alternative explanation for the "Fed information effect".' *American Economic Review* 113(3), 664–700

Bauer, Michael D, Carolin E Pflueger, and Adi Sunderam (2024a) 'Changing Perceptions and Post-Pandemic Monetary Policy.' In 'Reassessing the Effectiveness and Transmission of Monetary Policy' Jackson Hole Economic Policy Symposium

_ (2024b) 'Perceptions about monetary policy.' *The Quarterly Journal of Economics* 139(4), 2227–2278

Bernanke, Ben, and Olivier Blanchard (2025) 'What Caused the U.S. Pandemic-Era Inflation?' *American Economic Journal: Macroeconomics* 17(3), 1–35

Bernardini, Marco, and Alessandro Lin (2024) 'Out of the ELB: Expected ECB policy rates and the Taylor rule.' *Economics Letters* 235, 111546

Bernardini, Marco, Lara D'Arrigo, Alessandro Lin, and Andrea Tiseno (2024) 'Real interest rates and the ECB's monetary policy stance.' Banca d'Italia Occasional Paper 857, Banca d'Italia, June

Bobeica, Elena, Sarah Holton, Florian Huber, and Catalina Martínez Hernández (2025) 'Beware of large shocks!: A non parametric structural inflation model.' ECB Working Papers 3052, European Central Bank, June

Bodenstein, Martin, Christopher J. Erceg, and Luca Guerrieri (2008) 'Optimal monetary policy with distinct core and headline inflation rates.' *Journal of Monetary Economics* 55, S18–S33. Contributions to Macroeconomics in Honor of John Taylor

Brandt, Lennart, Arthur Saint Guilhem, Maximilian Schröder, and Ine Van Robays (2021) 'What drives euro area financial market developments? The role of US spillovers and global risk.' ECB Working Papers 2560, European Central Bank, May

Cesa-Bianchi, Ambrogio, and Andrej Sokol (2022) 'Financial shocks, credit spreads, and the international credit channel.' *Journal of International Economics* 135, 103543

Cieslak, Anna, and Hao Pang (2021) 'Common shocks in stocks and bonds.' *Journal of Financial Economics* 142(2), 880–904

Cuciniello, Vincenzo (2024) 'Market perceptions, monetary policy, and credibility.' Banca d'Italia Working Papers 1449, Banca d'Italia, March

De Santis, Roberto A., and Srečko Zimic (2022) 'Interest rates and foreign spillovers.' *European Economic Review* 144, 104043

De Santis, Roberto A, and Tommaso Tornese (2025) 'Energy supply shocks' nonlinearities on output and prices.' *European Economic Review* 176, 105037

Dedola, Luca, Giulia Rivolta, and Livio Stracca (2017) 'If the Fed sneezes, who catches a cold?' *Journal of International Economics* 108, S23–S41

Erceg, Christopher J., Dale W. Henderson, and Andrew T. Levin (2000) 'Optimal monetary policy with staggered wage and price contracts.' *Journal of Monetary Economics* 46(2), 281–313

Gazzani, Andrea, Fabrizio Venditti, and Giovanni Veronese (2024) 'Oil price shocks in real time.' *Journal of Monetary Economics* 144, 103547

Georgiadis, Georgios, and Marek Jarociński (2025) 'Global spillovers from multi-dimensional US monetary policy.' *Journal of International Economics* 158, 104169

Giannone, Domenico, and Giorgio Primiceri (2024) 'The Drivers of post-pandemic inflation.' NBER Working Papers 32859, National Bureau of Economic Research, August

Guerrieri, Veronica, Michala Marcussen, Lucrezia Reichlin, and Silvana Tenreyro (2023) *The Art and Science of Patience: Relative Prices and Inflation* number 26. In 'Geneva Reports on the World Economy.' (Geneva: ICMB International Center for Monetary and Banking Studies)

Hofmann, Boris, Cristina Manea, and Benoit Mojon (2024a) 'Targeted Taylor rules: Monetary policy responses to demand- and supply-driven inflation.' BIS Quarterly Review 241, Bank for International Settlements, December

Hofmann, Boris, Cristina Manea, and Benoit Mojon (2024b) 'Targeted taylor rules: some evidence and theory.' BIS Working Papers 1234, Bank for International Settlements, December

Höynck, Christian, and Luca Rossi (2023) 'The drivers of market-based inflation expectations in the euro area and in the US.' *Economics Letters* 232, 111323

Istrefi, Klodiana, Florens Odendahl, and Giulia Sestieri (2024) 'ECB communication and its impact on financial markets.' CEPR Discussion Papers 19242, Centre for Economic Policy Research, July

Jarociński, Marek (2022) 'Central bank information effects and transatlantic spillovers.' *Journal of International Economics* 139, 103683

Jarociński, Marek, and Peter Karadi (2020) 'Deconstructing Monetary Policy Surprises: The Role of Information Shocks.' *American Economic Journal: Macroeconomics* 12(2), 1–43

Kalemli-Özcan, Ṣebnem (2019) 'U.s. Monetary Policy and International Risk Spillovers.' NBER Working Papers 26297, National Bureau of Economic Research, September

Kamps, Christophe, Matthieu Bussière, Birgit Niessner, Oreste Tristani, Kai Christoffel, Sujit Kapadia, Giuseppe Ferrero, Niels Gilbert, Thomas Vlassopoulos, Roberto Motto, and R Gerke (2025) 'Report on monetary policy tools, strategy and communication.' ECB Occasional Paper 372, European Central Bank, June

Neri, Stefano (2024) 'There has been an awakening. The rise (and fall) of inflation in the euro area.' Banca d'Italia Occasional Paper 834, Banca d'Italia, March

Rubio-Ramirez, Juan F, Daniel F Waggoner, and Tao Zha (2010) 'Structural vector autoregressions: Theory of identification and algorithms for inference.' *The Review of Economic Studies* 77(2), 665–696

Shapiro, Adam Hale (2024) 'Decomposing Supply- and Demand-Driven Inflation.' *Journal of Money, Credit and Banking*, forthcoming

Appendix to

What drives policy rate expectations?

Evidence from the post-pandemic monetary policy cycle

by Luca Baldo and Marco Bernardini

October 2025

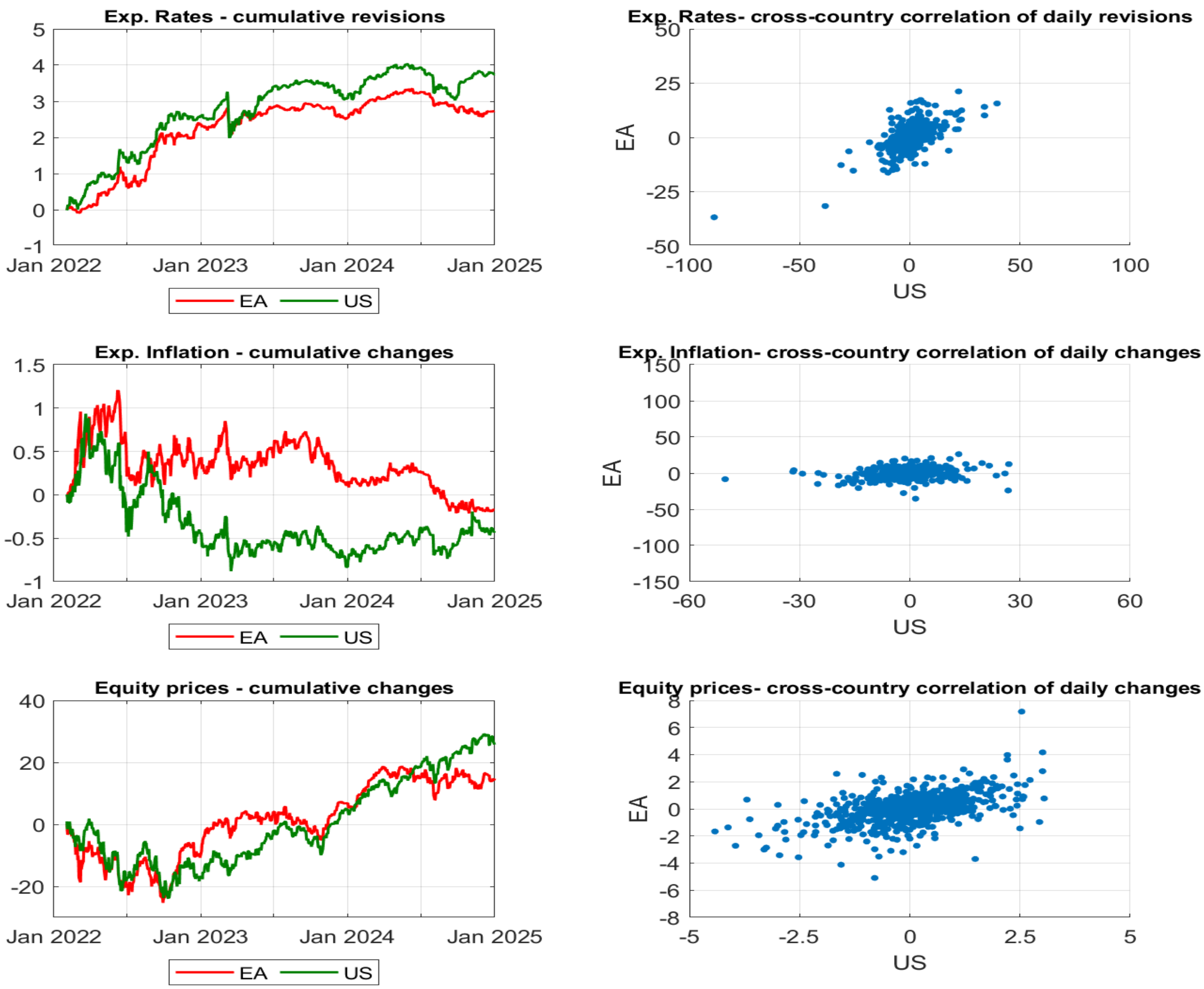
This appendix provides additional figures and robustness checks referenced in the paper.

Table A1. Summary statistics of daily revisions in expected ECB and Fed rates

Sample	Variable	Mean	Median	Min	Max	Std. Dev.	Obs.
2006–2008	Revisions of expected ECB rates	-0.3	0.0	-22.3	20.7	3.8	760
	Revisions of expected Fed rates	-0.5	0.0	-39.8	28.9	5.3	760
2009–2021	Revisions of expected ECB rates	-0.1	0.0	-17.3	15.1	1.7	3415
	Revisions of expected Fed rates	-0.1	0.0	-26.2	22.3	1.8	3415
2022–2024	Revisions of expected ECB rates	0.4	0.4	-36.8	21.2	4.8	764
	Revisions of expected Fed rates	0.5	0.5	-88.8	39.6	6.9	764

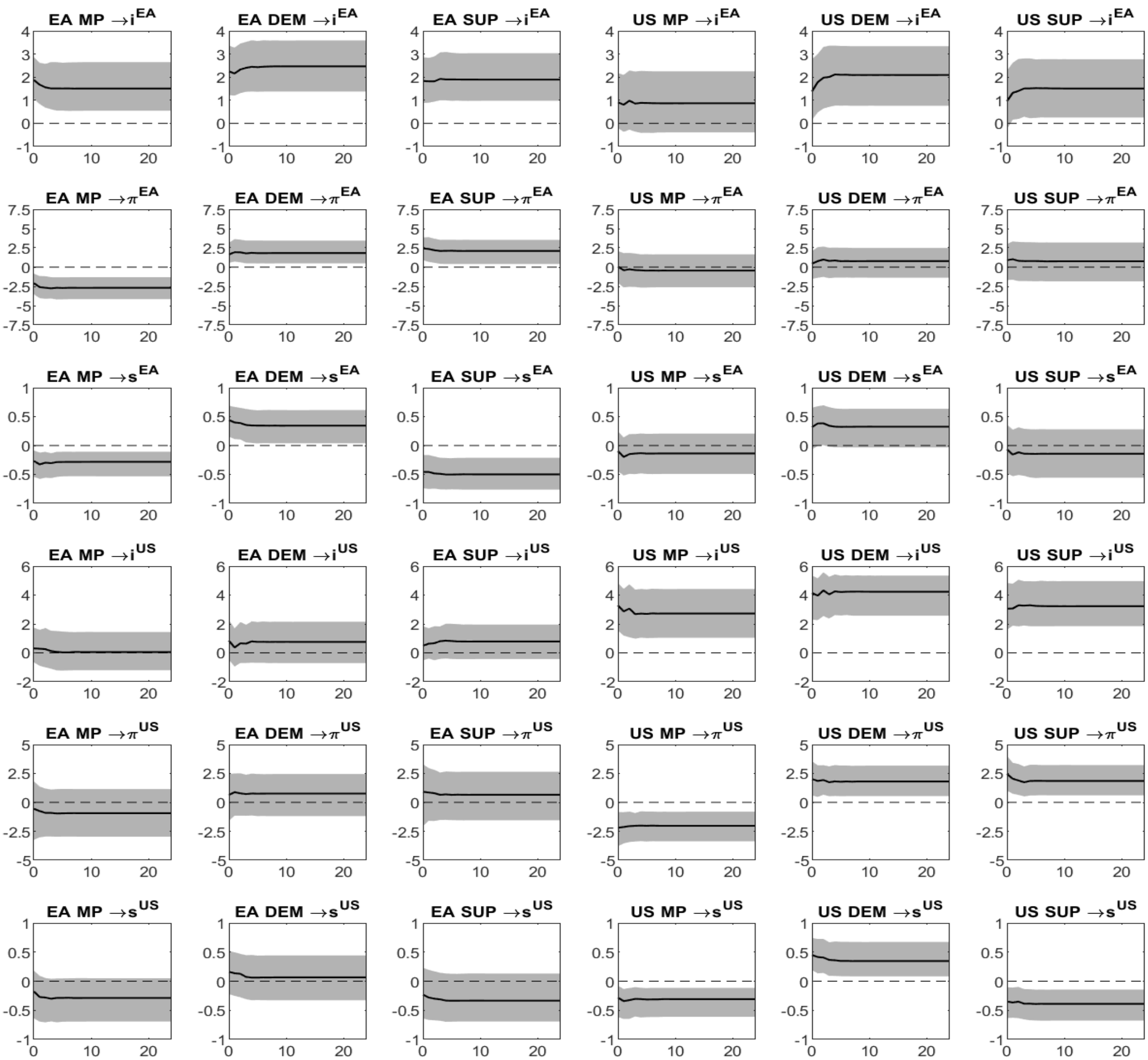
Notes. The table presents summary statistics of daily revisions in expected ECB and Fed policy rates (in basis points) for three periods: 2006–2008, 2009–2021, and 2022–2024. For each variable and period, the mean, median, minimum, maximum, standard deviation, and number of observations are reported.

Figure A1. Data



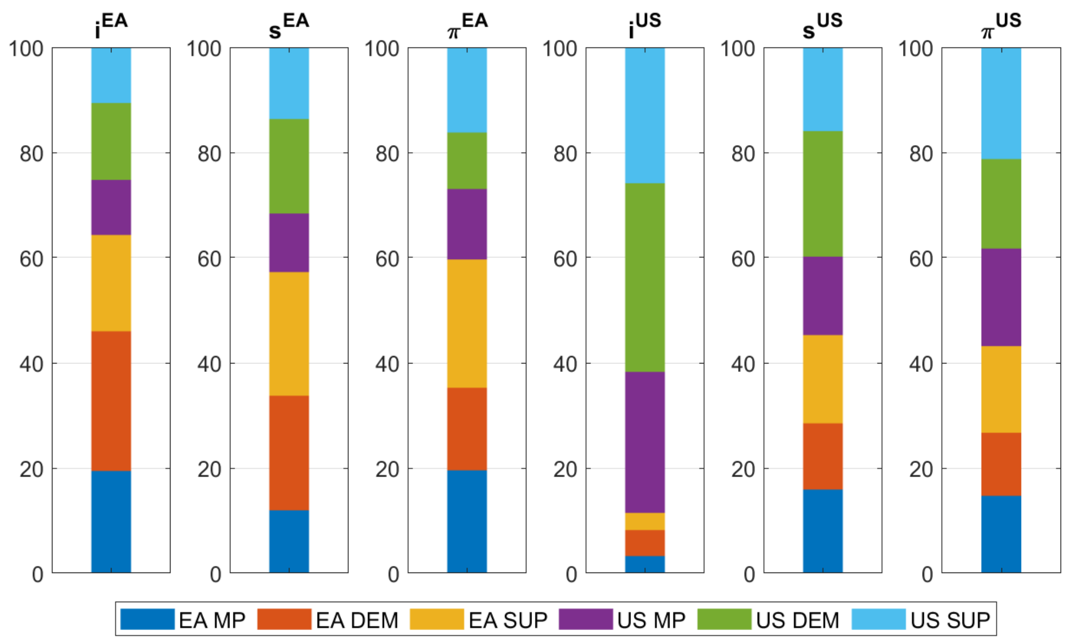
Notes. The figure presents the data used in the Vector Autoregression (VAR) model and their cross-country correlations. Variables are defined in Section 2.1: revisions in expected rates follow eq. (1), expected inflation is proxied by 1-year-1-year Inflation-Linked Swap rates, and equity prices represent the EURO STOXX index for the euro area and the S&P 500 for the United States. Left panels illustrate cumulative revisions (or changes) from February 2022 to December 2024, measured in percentage points. Right panels display cross-country correlations of daily revisions (or daily changes) – rates and inflation are expressed in basis points, while stock price indices are expressed in percentage points.

Figure A2. Impulse responses to one standard deviation shocks



Notes. The figure shows the full set of impulse response functions (IRFs). They are expressed as responses to one-standard-deviation shocks over a 10 business-day horizon. i^c denotes revisions in expected rates for country c, s^c denotes log-returns of the equity index for country c, and π^c denotes changes in market-based inflation expectations in country c. Grey areas represent 68% credible intervals, and the black solid lines indicate the median IRFs. Responses are measured in basis points for rates and inflation, and in percentage points for stocks.

Figure A3. Forecast error variance decompositions

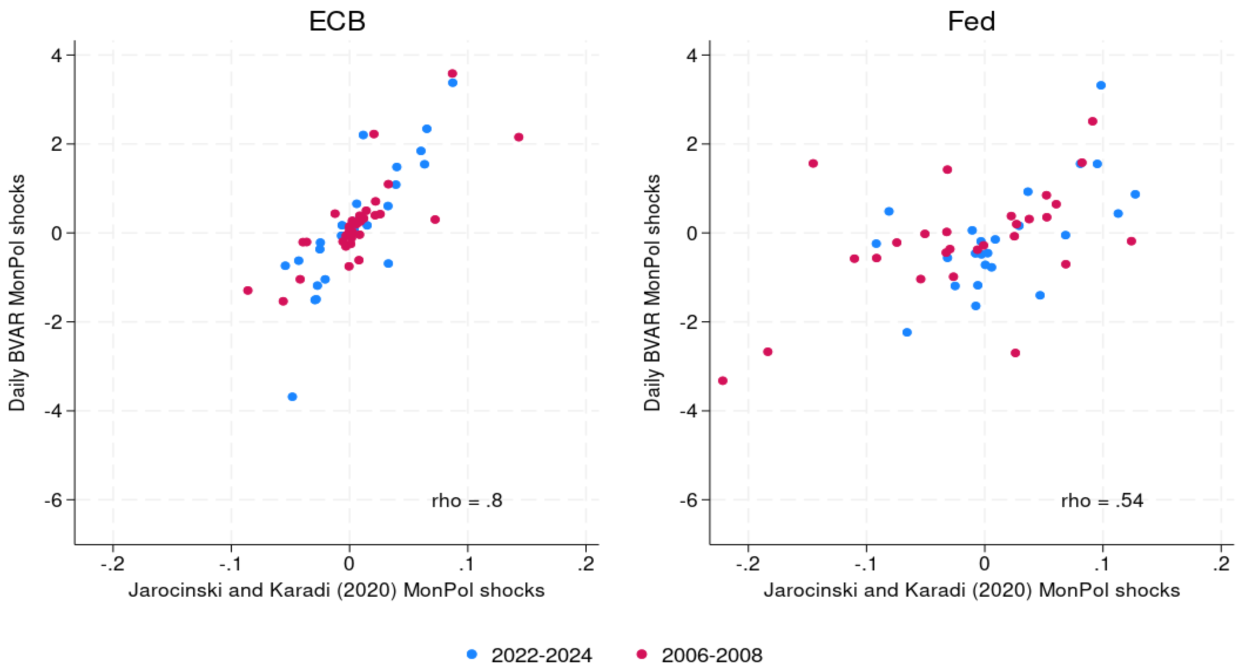


Notes. The figure illustrates the contribution of domestic and foreign shocks to the volatility of all six endogenous variables by means of Forecast Error Variance Decompositions (FEVDs) evaluated on impact (expressed as percentage of the total volatility). i^c stands for revisions in expected rates for country c, s^c stands for log-returns of the equity index of country c, π^c stands for changes in market-based inflation expectations in country c.

Figure A4. Robustness: forecast error variance decompositions

Notes. The figure illustrates the average contributions of domestic and foreign shocks to the volatility of revisions in expected ECB and Fed rates (expressed as percentage of the total volatility), by means of Forecast Error Variance Decompositions (FEVDs) evaluated on impact. The first (second) column shows the contribution of shocks to euro-area (US) expected rates under different model specifications (see section 4).

Figure A5. Comparison with other measures of monetary policy shocks



Notes. The figure illustrates the correlation between monetary policy shocks identified via the methodology outlined in this paper and those identified with the methodology of Jarociński and Karadi (2020). Shocks from our approach are expressed in standard deviation units, while those from Jarociński and Karadi (2020) are computed as the first principal component of surprises in interest rate derivatives with maturities ranging from 1 month to 1 year. Our model is estimated with two different samples: with data from 2022 to 2024 (blue dots) and with data from 2006 to 2008 (red dots). The correlation coefficient reported in each panel (rho) is computed using shocks identified with both samples.