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ANETE KRAVINSKA
ANDREJS ZLOBINS

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Latvijas Banka
K. Valdemāra iela 2A, Riga, LV-1050
Tel.: +371 67022300 info@bank.lv
http://www.bank.lv https://www.macroeconomics.lv

Oil Price Pass-Through and Inflation Expectations: Insights from Time-Varying and Real-Time Approaches*

Anete Kravinska† Andrejs Zlobins‡

November 2026

Abstract

The surge in energy prices following the outbreak of the war in Iran has renewed interest in the second-round effects of oil price shocks. This paper documents the pass-through of oil supply shocks to inflation and inflation expectations in the euro area and proposes a framework to monitor the pass-through in real time using financial market data. We first establish the historical narrative with a structural vector autoregression with time-varying parameters and stochastic volatility (TVP-SVAR-SV), identified with the high-frequency oil supply news shock of Känzig (2021) and estimated over 1999–2025. We then track the propagation of oil supply shocks at daily frequency using a Bayesian SVAR in the spirit of Brandt et al. (2021), augmented with the Brent oil price and inflation-linked swap rates, and complement it with Bernanke-style regressions to gauge the degree of anchoring of inflation expectations. We find that the pass-through of oil supply shocks to headline inflation had largely normalised by 2025, with peak effects materialising after four to five quarters. However, short-run inflation expectations exhibit heightened sensitivity to energy shocks after 2022, with real-time estimates signalling a slight increase since the outbreak of the war in Iran, while long-run expectations remain well anchored. Market pricing of the expected monetary policy response helps contain short-run inflation expectations.

Keywords: oil supply shocks, inflation expectations, anchoring, monetary policy, TVP-SVAR-SV, high-frequency identification
JEL codes: C32, C54, E31, E52, Q43

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†Latvijas Banka, K. Valdemāra iela 2A, Riga, LV-1050, Latvia. E-mail: Anete.Kravinska@bank.lv.
‡Latvijas Banka, K. Valdemāra iela 2A, Riga, LV-1050, Latvia. E-mail: Andrejs.Zlobins@bank.lv.

1 Introduction

The surge in energy prices following the outbreak of the war in Iran has renewed interest in the second-round effects of oil price shocks. The inflation surge of 2021–2023 demonstrated that large energy cost-push disturbances can infiltrate inflation expectations, thereby allowing energy prices to affect core inflation dynamics and amplify the pass-through to headline inflation (Neri et al., 2023; De Santis and Tornese, 2023; Alessandri and Gazzani, 2025). That experience showed that central banks can no longer mechanically rely on the textbook prescription of 'looking through' supply-side disturbances: the size and persistence of the shock are paramount for calibrating the appropriate monetary policy response. At the same time, a key take-away from the 2022–2023 tightening cycle is that, in such conditions, central banks can leverage a lower sacrifice ratio and act forcefully to stabilise inflation expectations (Ascari et al., 2025; Forbes et al., 2025; Zlobins, 2025).

Calibrating the policy response to an unfolding energy shock, however, requires timely evidence on whether, and how strongly, the shock is feeding into inflation expectations. Conventional macroeconometric tools operate at monthly or quarterly frequency and become informative only with considerable delay, whereas disruptions in commodity markets materialise within days. This tension motivates the present paper. We document the pass-through of oil supply shocks to inflation and, in particular, to inflation expectations in the euro area through 2025. In addition, we develop a framework for monitoring the pass-through in real time using financial market data, which allows us to cover the episode triggered by the war in Iran.

Our empirical strategy rests on three complementary building blocks. First, we establish the historical narrative at quarterly frequency using a structural vector autoregression with time-varying parameters and stochastic volatility (TVP-SVAR-SV), estimated over 1999Q1–2025Q2. The benchmark specification comprises euro area real GDP, HICP inflation, the 3-month EURIBOR, the EUR/USD exchange rate, and the Brent oil price, with the oil supply shock identified using the high-frequency oil supply news series of Känzig (2021). Measures of underlying inflation and of inflation expectations – the 1Y1Y and 5Y5Y inflation-linked swap (ILS) implied forward rates, the one- and five-year ahead

expectations from the ECB Survey of Professional Forecasters (SPF), and the price expectations of consumers and firms – are then added to the system one at a time. Second, we deploy a daily Bayesian SVAR along the lines of Brandt et al. (2021), which we extend with the Brent oil price and ILS rates and identify via sign restrictions, to track the propagation of oil supply shocks to inflation expectations in real time. The model is estimated over the period from 3 January 2007 to 17 June 2026, both over the full sample and over rolling windows of 260 trading days. Third, we run Bernanke-style regressions of daily revisions in ILS forwards on the identified structural shocks, which provide a simple scalar metric of the degree of anchoring (Bernanke, 2007; Gürkaynak et al., 2005).

Four main findings emerge. First, the pass-through of oil supply shocks to headline inflation was largely in line with historical regularities by 2025, with peak effects materialising after four to five quarters, following a marked amplification during the 2021–2023 inflation surge. Second, short-run inflation expectations exhibit heightened sensitivity to energy shocks after 2022, and our real-time estimates signal a slight further increase since the outbreak of the war in Iran. This change is not confined to financial markets: the pass-through to the expectations of professional forecasters, consumers, and firms has also become somewhat larger and more persistent after 2022. Third, long-run inflation expectations have been considerably better anchored and show a limited response to recent oil shocks. Fourth, market pricing of the expected monetary policy response helps contain short-run inflation expectations: restrictive policy surprises lower ILS forwards, and markets price a tightening in response to adverse oil supply shocks, which caps the revision of inflation beliefs.

The paper makes three contributions. First, it provides updated time-varying evidence on oil price pass-through in the euro area, based on high-frequency identification and covering the post-pandemic reappraisal of energy shocks through 2025. Second, it proposes a real-time monitoring toolkit: to the best of our knowledge, the extension of the daily financial-market SVAR of Brandt et al. (2021) with an oil supply shock, disentangled from global risk and US-specific disturbances, and with market-based measures of inflation compensation is new to the literature. Third, the daily evidence on the response of

inflation expectations to monetary policy shocks speaks directly to the traction of policy on beliefs during and after the recent tightening cycle, complementing the emerging literature on the appropriate response to supply shocks.

The remainder of the paper is organised as follows. Section 2 reviews the related literature. Section 3 lays out the empirical framework. Section 4 presents the results together with robustness checks, for which additional figures are reported in Appendix A, and Section 5 concludes.

2 Related literature

This paper relates to three strands of literature. The first strand studies the macroeconomic effects of oil price shocks, dating back to Hamilton (1983). A central insight of this literature is that the source of the oil price movement matters: supply-driven increases are stagflationary, whereas demand-driven increases tend to accompany, rather than derail, economic expansions (Kilian, 2009; Baumeister and Hamilton, 2019). Identification has progressively moved towards narrative and high-frequency approaches; in this paper we rely on Känzig (2021), who exploits the reaction of oil futures prices in narrow windows around OPEC announcements to construct a series of oil supply news shocks. For the euro area, Hahn (2003) and Peersman and Van Robays (2009) provide early evidence on the pass-through of external and oil shocks to consumer prices. A related set of studies documents pronounced time variation in the transmission of oil shocks: Baumeister and Peersman (2013) show that the effects of oil supply shocks on the US economy have declined over time, while Choi et al. (2018) document a falling pass-through of oil price shocks to domestic inflation across a large panel of countries. The 2021–2023 inflation surge prompted a reappraisal of these findings: Neri et al. (2023) show that energy shocks accounted for the bulk of the euro area inflation surge, De Santis and Tornese (2023) document nonlinearities whereby large energy supply shocks pass through more than proportionally, and Alessandri and Gazzani (2025) demonstrate that natural gas shocks differ materially from oil shocks. We contribute updated time-varying evidence for the euro area through 2025 based on high-frequency identification.

The second strand concerns the formation and anchoring of inflation expectations. Gürkaynak et al. (2005) propose the sensitivity of far-forward rates to macroeconomic news as a test of anchoring, and Beechey et al. (2011) apply this metric to compare the euro area and the United States. Bernanke (2007) popularised using regressions of changes in inflation compensation on commodity price surprises as a monitoring device; we adopt a structural variant of this approach in which the regressor is an identified oil supply shock rather than a raw price change, thereby avoiding the endogeneity of oil price movements to global demand conditions (Kilian, 2009). Market-based measures of inflation compensation contain inflation risk and liquidity premia, which warrants caution when mapping them into genuine expectations (Camba-Méndez and Werner, 2017). On the interaction between oil prices and expectations, Coibion and Gorodnichenko (2015) show that household inflation expectations closely track oil prices, helping to explain the missing disinflation after the Great Recession, while Wong (2015) finds that inflation expectations propagate the inflationary impact of oil shocks. For the euro area, Corsello et al. (2021) warn of de-anchoring risks following persistent inflation shortfalls; the post-2022 concern is the mirror image, namely upward de-anchoring in response to cost-push shocks.

The third strand examines the appropriate monetary policy response to supply shocks. Blanchard and Galí (2007) attribute the milder macroeconomic effects of the oil shocks of the 2000s in part to improved policy credibility and better-anchored expectations. The recent tightening cycle has revived this debate: Ascari et al. (2025) show that nonlinear Phillips curves imply a lower sacrifice ratio when inflation is high, making a forceful response comparatively cheap in terms of foregone output; Forbes et al. (2025) document the trade-offs over rate cycles between activity, inflation, and the price level; and Zlobins (2025) provides evidence on the lags and strength of euro area monetary policy transmission during the recent hiking cycle. Our daily evidence on the response of ILS forwards to monetary policy shocks speaks directly to the traction of policy on inflation beliefs during and after the tightening episode.

Methodologically, the paper builds on the TVP-VAR tradition of Cogley and Sargent

(2005), Primiceri (2005) and Del Negro and Primiceri (2015), and on daily financial-market BVARs identified via sign restrictions (Brandt et al., 2021). The inclusion of an externally constructed shock series within the VAR follows the internal-instrument logic formalised by Plagborg-Møller and Wolf (2021). Bridging low-frequency structural analysis and daily real-time monitoring of oil price pass-through within a unified narrative is, to the best of our knowledge, novel in this context.

3 Empirical framework

3.1 A time-varying structural VAR with stochastic volatility

We begin by establishing a historical narrative of oil price pass-through in the euro area using a structural VAR with time-varying parameters and stochastic volatility. Let y_t for $t = 1, \ldots, T$ denote a vector of endogenous variables, evolving according to:

$$y_t = c + A_1 y_{t-1} + ... + A_p y_{t-p} + u_t \tag{1}$$

where c is an $n \times 1$ vector of constants, A_j $(j = 1, \ldots, p)$ are $n \times n$ coefficient matrices, and u_t is an $n \times 1$ reduced-form error vector with $E[u_t] = 0$ and $E[u_t u_t'] = \Sigma$. Σ is a symmetric positive definite $n \times n$ variance-covariance matrix of the reduced-form errors, while T denotes the sample size. For convenience, we stack matrices of SVAR coefficients from equation (1), which are allowed to vary over time, into vector $\theta_t = (c_t', \text{vec}(A_{1,t})', \ldots, \text{vec}(A_{p,t})')$. The time variation of coefficients is then assumed to evolve according to a random walk process:

$$\theta_t = \theta_{t-1} + \upsilon_t \qquad \upsilon_t \sim N(0, \Omega) \tag{2}$$

where υ_t is a white noise vector with block-diagonal covariance matrix Ω. Additionally, in order to allow the error covariance matrix to be period-specific, we introduce stochastic volatility in the model as follows:

$$\Sigma_t = F \Lambda_t F' \tag{3}$$

where F is a lower triangular matrix with a unit diagonal and Λ_t is a diagonal matrix with elements denoted by $\exp(\lambda_{i,t})$ and the log-volatilities $\lambda_{i,t}$ following the AR(1) process:

$$\lambda_{i,t} = \gamma\lambda_{i,t-1} + \nu_{i,t} \qquad \nu_{i,t} \sim N(0, \phi_i\ ) \tag{4}$$

where γ is a persistence parameter set to 0.8 for all volatilities and $\nu_{i,t}$ is a white noise error with variance ϕ_i. Instead of adopting the random walk assumption of Cogley and Sargent (2005) and setting $\gamma = 1$, we choose a slightly lower value for γ, since the random walk assumption implies that shifts in volatility become permanent and volatility does not revert to its long-run value. Key macroeconomic variables like real GDP and inflation will typically have higher volatility during recessions but will return to their long-run values once the economic turbulence calms down. We make the following assumptions about the prior distribution in our TVP-SVAR-SV:

$$\pi(\theta|\Omega) \ \sim \ N(0, \Omega_0) \tag{5}$$

$$\pi(f_i^{-1}) \ \sim \ N(f_{i0}^{-1}, \Upsilon_{i0}) \tag{6}$$

$$\pi(\lambda_i|\phi_i\ ) \ \sim \ N(0, \phi_0) \tag{7}$$

$$\pi(\omega_i) \ \sim \ IG(\frac{\chi_0}{2}, \frac{\psi_0}{2}) \tag{8}$$

$$\pi(\phi_i) \ \sim \ IG(\frac{\alpha_0}{2}, \frac{\delta_0}{2}) \tag{9}$$

where f_i^{-1} denotes the vector in the F^{-1} matrix containing the non-zero and non-one elements with mean f_{i0}^{-1} and covariance Υ_{i0} for $i = 2, \ldots, n$, ω_i are diagonal entries in the Ω matrix, and χ_0 and ψ_0 denote the hyperparameters governing the shape and scale of the variance. In order to make the prior non-informative, we set χ_0=ψ_0=0.001. Similarly, α_0 and δ_0 are hyperparameters related to the variance of volatility which are set to α_0=δ_0=0.001. Parameters Ω_0, f_{i0}^{-1}, Υ_{i0} and ϕ_0 are set equal to their OLS estimates from a time-invariant SVAR.

The benchmark specification consists of five variables: euro area real GDP, HICP inflation, the 3-month EURIBOR, the EUR/USD exchange rate, and the Brent oil price.

All variables enter in log-differences, with the exception of the 3-month EURIBOR and HICP inflation, which enter in levels. Thus, impulse responses of log-differenced variables are cumulated in order to back out the impact on levels. The model is estimated over the sample from 1999Q1 to 2025Q2 with two lags, so that time-varying impulse responses are available from 1999Q3 onwards. To pin down the transmission to underlying inflation and expectation formation, we then augment the benchmark specification one variable at a time, which keeps the dimensionality of the time-varying system manageable. To capture indirect and second-round effects, we consider HICP core and services inflation, the ECB's Persistent and Common Component of Inflation (PCCI) and compensation per employee. To capture expectation formation, we consider the 1Y1Y and 5Y5Y ILS implied forward rates, the one- and five-year ahead inflation expectations from the ECB SPF and the disagreement among SPF forecasters at both horizons, measured by the cross-sectional variance of their individual point forecasts, as well as consumers' price expectations over the next 12 months and industry selling price expectations from the European Commission's Business and Consumer Surveys. Specifications including market-based measures, the PCCI and the SPF five-year ahead expectations or their disagreement are estimated over correspondingly shorter samples, reflecting data availability, with impulse responses available from 2005Q1, 2001Q1, and 2001Q3, respectively. The oil supply shock is identified using the oil supply news shock series of Känzig (2021), which is estimated from a monthly proxy VAR with high-frequency surprises in oil futures prices around OPEC announcements as an external instrument. We aggregate the series to quarterly frequency by summing its monthly values within each quarter, including it in the VAR and ordering it first, so that the shock is recovered recursively in the spirit of the internal-instrument approach (Plagborg-Møller and Wolf, 2021).

Throughout, the shock is normalised to generate a 10% increase in the Brent oil price in each period, which renders the estimated elasticities comparable over time.

3.2 A daily Bayesian SVAR for real-time monitoring

The quarterly evidence necessarily ends with the latest data vintage and is therefore silent on fast-moving episodes such as the one triggered by the war in Iran. To track the propagation of oil supply shocks to inflation expectations in real time, we deploy a daily Bayesian SVAR along the lines of Brandt et al. (2021). The vector of endogenous variables evolves as in equation (1) and the model is estimated with Bayesian methods by specifying a normal-Wishart prior distribution. Let $\alpha = \text{vec}([c, A_1, \ldots, A_p])$ denote the $k \times 1$ vector of all VAR coefficients, where $k = n(np + 1)$. Conditional on the residual covariance matrix Σ, the prior distribution assumes:

$$\alpha \mid \Sigma \sim N(\alpha_0, \Sigma \otimes \Phi_0) \tag{10}$$

where α_0 is a $k \times 1$ vector of prior means and Φ_0 is an $(np+1) \times (np+1)$ diagonal matrix with variance relating to lag l of variable j given by:

$$\phi_{j,l} = \frac{1}{\sigma_j^2} \left(\frac{\lambda_1}{l^{\lambda_3}} \right)^2 \tag{11}$$

where σ_j^2 denotes the OLS residual variance of an autoregressive model estimated for variable j, λ_1 is a hyperparameter that controls the overall tightness, l is the lag considered by the coefficient and λ_3 controls the relative tightness of the variance of lags, excluding the first one. Combined with the Kronecker structure in equation (10), the prior variance of the coefficient on lag l of variable j in equation i equals $(\sigma_i^2/\sigma_j^2)(\lambda_1/l^{\lambda_3})^2$. Hence, unlike in the Minnesota prior, own and cross-variable lags are shrunk symmetrically, i.e. the cross-variable weighting hyperparameter is implicitly set to one. Finally, the variance for the constant is given by:

$$\phi_c = (\lambda_1 \lambda_4)^2 \tag{12}$$

where λ_4 is a hyperparameter governing the exogenous variable tightness. In our case, we specify the prior using standard values for the hyperparameters, i.e. we set the AR coefficient of the prior to 0, overall tightness λ_1=0.2, lag decay λ_3=1, and exogenous

variable tightness λ_4=100. Turning to the prior for the residual covariance matrix Σ, we assume that it follows an inverse-Wishart distribution:

$$\Sigma \sim IW(S_0, \nu_0) \tag{13}$$

where S_0 is an $n \times n$ scale matrix and ν_0 is the degrees of freedom parameter. Following Karlsson (2012), we set $\nu_0 = n + 2$ and obtain S_0 from individual AR regressions as:

$$S_0 = (\nu_0 - n - 1) \begin{pmatrix} \sigma_1^2 & 0 & 0 & 0 \\ 0 & \sigma_2^2 & 0 & 0 \\ 0 & 0 & \ddots & 0 \\ 0 & 0 & 0 & \sigma_n^2 \end{pmatrix} \tag{14}$$

where σ_i^2 is the residual variance from a univariate AR(p) regression for the i-th variable.

The posterior distribution of the reduced form parameters and the residual covariance matrix is obtained via the Gibbs sampler with a total number of 20 000 iterations with the first 10 000 discarded as burn-in.

The vector of endogenous variables comprises seven daily financial market series: (i) the real euro area OIS rate, constructed as the nominal OIS rate less the matched-maturity ILS rate; (ii) the Euro Stoxx 50 index; (iii) the S&P 500 index; (iv) the EUR/USD exchange rate; (v) the euro area–US OIS spread; (vi) the Brent oil price; and (vii) the ILS rate. We use both the 1Y1Y and the 5Y5Y ILS implied forward rates and match the OIS maturity accordingly, so that the model is estimated in two variants corresponding to short- and long-run inflation compensation. The real OIS rate, the euro area–US OIS spread and the ILS rate enter the model in first differences, while stock prices, the EUR/USD exchange rate and the Brent oil price enter in log-differences. The model is estimated over the sample from 3 January 2007 to 17 June 2026 with four lags.

Identification relies on sign restrictions and extends the original scheme of Brandt et al. (2021) in two dimensions: we add the Brent oil price and the ILS rate to the system, while also identifying an oil supply shock alongside the five original disturbances.

Table 1 summarises the restrictions, all of which are imposed to hold on impact only. A restrictive euro area monetary policy shock raises the real OIS rate, depresses euro area equity prices, appreciates the euro, widens the euro area–US OIS spread and lowers inflation compensation. A positive euro area macroeconomic news shock likewise raises the real rate, the euro, and the spread, while lifting equity prices and inflation compensation. US shocks are assumed to spill over positively to euro area real rates while compressing the spread and depreciating the euro against the dollar, with US monetary policy and macroeconomic news shocks lowering and raising, respectively, the S&P 500 and inflation compensation. The global risk shock is signed as an improvement in global risk sentiment: equity prices rise on both sides of the Atlantic, safe-haven demand unwinds so that real rates increase and the dollar weakens, US yields respond more strongly so that the spread narrows, and inflation compensation increases. Finally, an adverse oil supply shock raises the Brent oil price and inflation compensation, depresses equity prices in both regions, depreciates the euro – in line with the terms-of-trade deterioration of a net energy importer – and raises the real OIS rate as markets price in a monetary policy response.

Table 1: Identification of the daily Bayesian SVAR: sign restrictions

Shock	Real EA OIS	Euro Stoxx 50	S&P 500	EUR/USD	EA–US OIS spread	Brent oil price	ILS
EA monetary policy	+	−		+	+		−
EA macro	+	+		+	+		+
US monetary policy	+		−	−	−		−
US macro	+		+	−	−		+
Global risk	+	+	+	+	−		+
Oil supply	+	−	−	−		+	+

Notes: The table reports the sign restrictions used to identify the structural shocks in the daily Bayesian SVAR. All restrictions are imposed to hold on impact only. Blank entries denote unrestricted responses. The ILS rate and the maturity of the (real) OIS rate are matched, i.e. the model is estimated separately for the 1Y1Y and 5Y5Y horizons.

In order to trace the evolution of the pass-through, the model is re-estimated over rolling windows of 260 trading days – approximately one calendar year – with the first window ending in early January 2019 and the last on 17 June 2026, thereby covering the pandemic, the 2021–2023 inflation surge, and the current episode. The oil supply shock is normalised to generate a 10% increase in the Brent oil price in each window, while the

euro area monetary policy shock is normalised to a 25-basis-point increase in the OIS rate. Impulse responses of differenced variables are cumulated in order to back out the impact on levels.

3.3 Anchoring regressions

Finally, we condense the information in the daily data into a scalar measure of anchoring by running Bernanke-style regressions (Bernanke, 2007) of the form

$$\Delta E_t(\pi) = \alpha + \beta\, \varepsilon_t^{oil} + u_t, \tag{15}$$

where $\Delta E_t(\pi)$ denotes the daily change in inflation expectations, proxied by the ILS implied forward rates, ε_t^{oil} is the high-frequency oil supply shock recovered from the daily Bayesian SVAR and normalised by its standard deviation, and u_t is an error term. The coefficient β admits a straightforward interpretation: $\beta = 0$ indicates that exogenous oil supply shocks do not pass through to inflation beliefs, whereas $\beta > 0$ indicates that agents revise their expectations in response to supply-side disturbances. At long horizons, a positive β constitutes evidence of de-anchoring, whereas at short horizons it signals a higher perceived risk of more persistent, second-round effects. We estimate equation (15) over rolling windows of 260 trading days and report 95% confidence intervals. An analogous regression replaces ε_t^{oil} with the euro area monetary policy shock, in which case $\beta < 0$ indicates that restrictive policy surprises lower inflation compensation. Its magnitude therefore measures the traction of monetary policy on inflation beliefs.

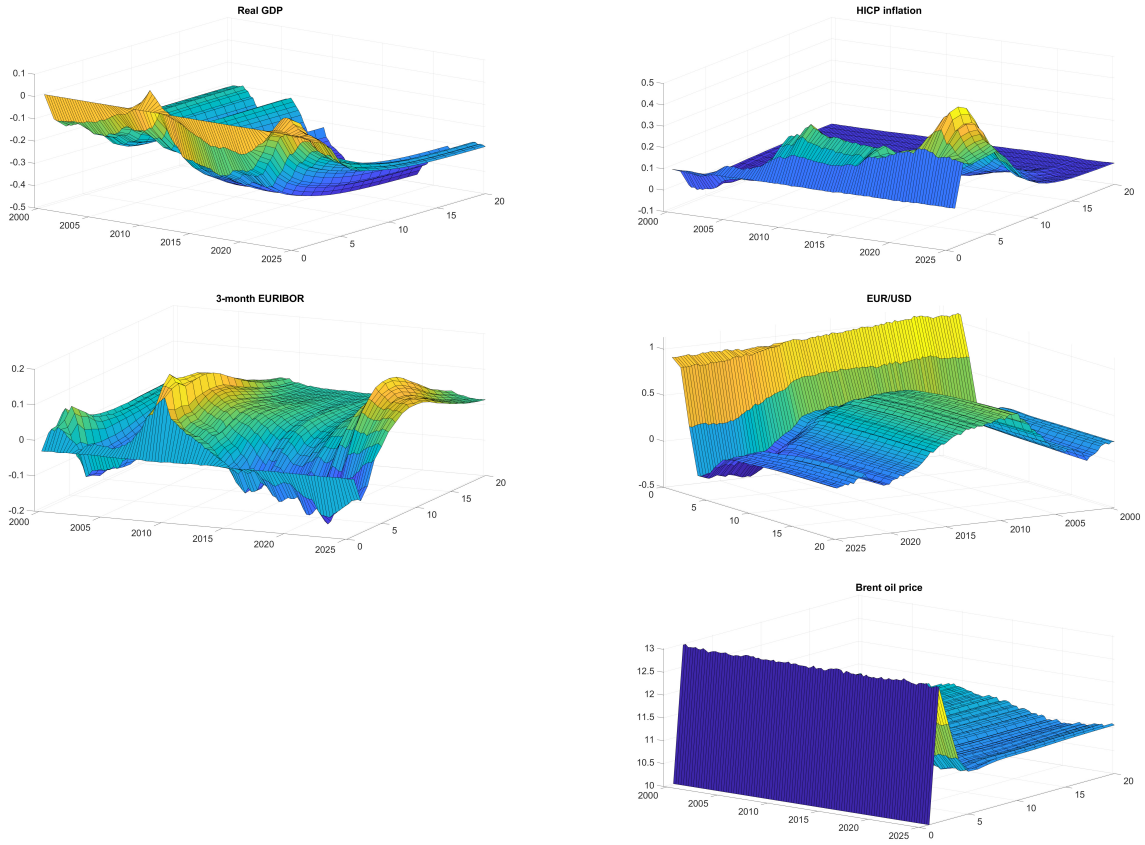
4 Results

4.1 The time-varying pass-through of oil supply shocks

Figure 1 reports the time-varying impulse responses of the euro area variables included in the baseline specification of the TVP-SVAR-SV model to the oil supply news shock of Känzig (2021). Results show that output contracts persistently following an adverse oil

supply shock, in line with the stagflationary nature of the disturbance. The pass-through to headline inflation is hump-shaped, with peak effects typically materialising after four to five quarters. Moreover, our findings suggest that non-linearities matter in the case of large shocks – during the 2021–2023 inflation surge, the pass-through to inflation was substantially larger, with more than two times stronger impact compared to the pre-pandemic period. However, by mid-2025, the estimated pass-through of oil supply shocks had largely normalised and was back in line with historical regularities.

Figure 1: Time-varying impulse responses to an oil supply news shock

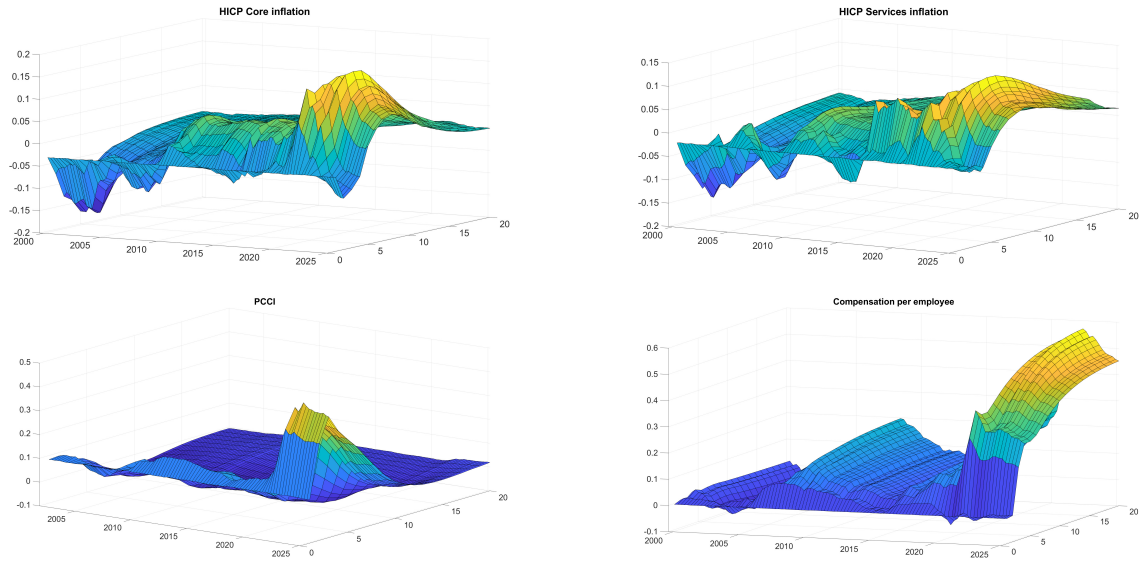


Notes: The figure shows impulse response functions from the TVP-SVAR-SV to an oil supply news shock of Känzig (2021) over the period from 1999Q3 to 2025Q2. The shock has been normalised to generate a 10% increase in the Brent oil price in each period, allowing the estimated elasticities to be comparable over time. The responses of real GDP, the EUR/USD exchange rate, and the Brent oil price are cumulative, while those of HICP inflation and the 3-month EURIBOR are shown in levels.

The monetary policy response to energy disturbances has generally followed the look-through prescription, since the reaction of the 3-month EURIBOR was muted for most of the sample. The exception arises in episodes of large shocks: the EURIBOR response turns distinctly positive during the recent inflation surge, indicating that policy leaned

against the energy shock when its size and persistence threatened the inflation outlook.

Figure 2: Time-varying impulse responses of measures of underlying inflation to an oil supply news shock



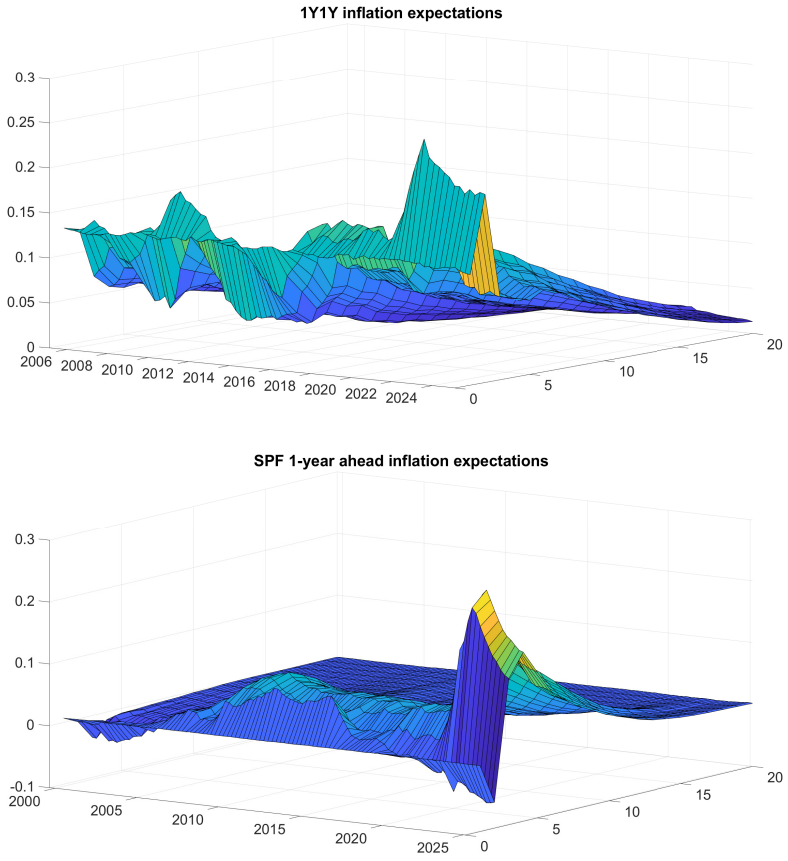
Notes: The figure shows impulse response functions from the TVP-SVAR-SV to an oil supply news shock of Känzig (2021) over the period from 1999Q3 (2001Q1 for the PCCI) to 2025Q2. The shock has been normalised to generate a 10% increase in the Brent oil price in each period, allowing the estimated elasticities to be comparable over time. The response of compensation per employee is cumulative, while those of the other measures are shown in levels.

The early part of the sample includes the 2007–2008 oil price surge, when the Brent oil price peaked at close to USD 150 per barrel. The estimated pass-through to headline inflation in this period is sizeable and broadly in line with existing evidence for the euro area (Peersman and Van Robays, 2009; Donoval et al., 2010). The first pronounced increase in the response of the 3-month EURIBOR around 2008 is consistent with our finding that the ECB has generally looked through oil supply shocks, except in episodes of large disturbances: in July 2008, with headline inflation at 4%, the ECB raised its key interest rates to guard against second-round effects from surging energy and food prices. This is in line with Holm-Hadulla and Hubrich (2017), who identify mid-2008 to early 2011 as a period in which oil price shocks had pronounced effects on euro area inflation and inflation expectations with monetary policy leaning against second-round effects.

Our findings also document an increasingly important amplification channel of energy shocks in the euro area. Whereas in the early part of the sample the euro tended to appreciate following adverse oil supply shocks, in recent years oil price surges increasingly

coincide with an exchange rate depreciation against the US dollar. Since energy commodities are predominantly invoiced in US dollars, a concurrent depreciation compounds the domestic cost of energy imports and amplifies the pass-through to consumer prices.

Figure 3: Time-varying impulse responses of short-run inflation expectations to an oil supply news shock

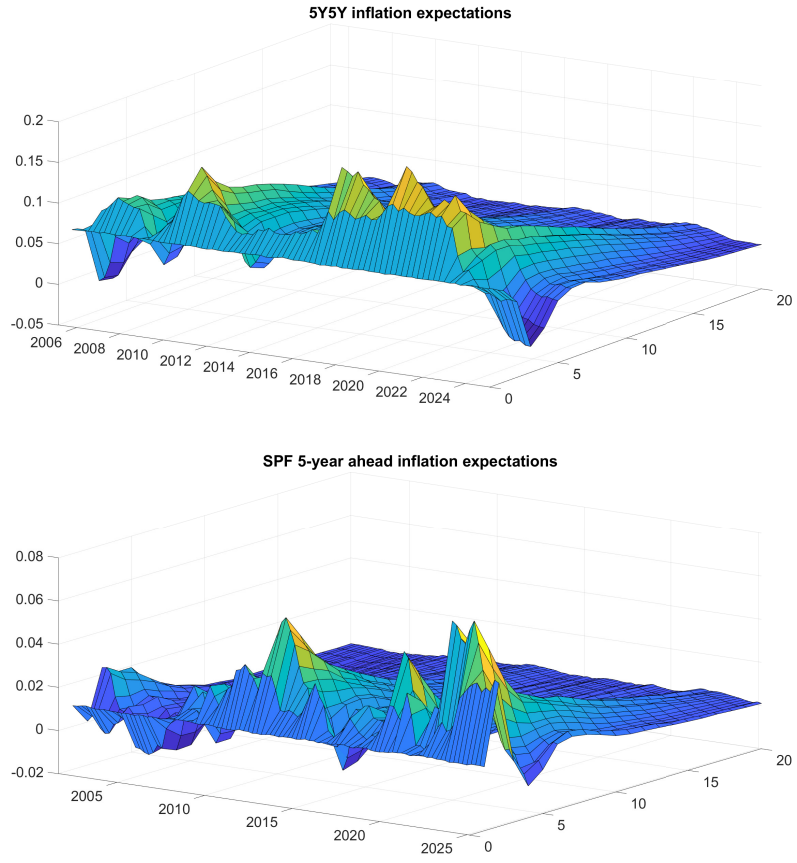


Notes: The figure shows impulse response functions from the TVP-SVAR-SV to an oil supply news shock of Känzig (2021) over the period from 1999Q3 (2005Q1 for the 1Y1Y ILS forward) to 2025Q2. The shock has been normalised to generate a 10% increase in the Brent oil price in each period, allowing the estimated elasticities to be comparable over time. The responses are shown in levels.

To shed light on indirect and second-round effects, Figure 2 reports the responses for measures of underlying inflation. Before the global financial crisis, the response of HICP core and services inflation to an adverse oil supply shock was slightly negative, possibly reflecting the contractionary effect of higher energy prices on demand, and it remained close to zero throughout the 2010s. In the post-pandemic period, by contrast, both measures display a pronounced hump-shaped increase, peaking at around 0.15 and 0.1 percentage points, respectively, after one to two years, which points to indirect and second-round effects of oil supply shocks on core prices. The response of the PCCI, which

captures the persistent and common component of inflation, spikes during 2021–2022 and has remained elevated relative to its pre-pandemic level since then. The response of compensation per employee points in the same direction. Negligible until 2020, it has since become considerably stronger and more persistent, with effects becoming visible only after four quarters and building up gradually thereafter. Thus, while the pass-through to headline inflation had largely normalised by mid-2025, second-round effects via wages were still unfolding – a further reason for close monitoring of the pass-through of energy shocks.

Figure 4: Time-varying impulse responses of long-run inflation expectations to an oil supply news shock

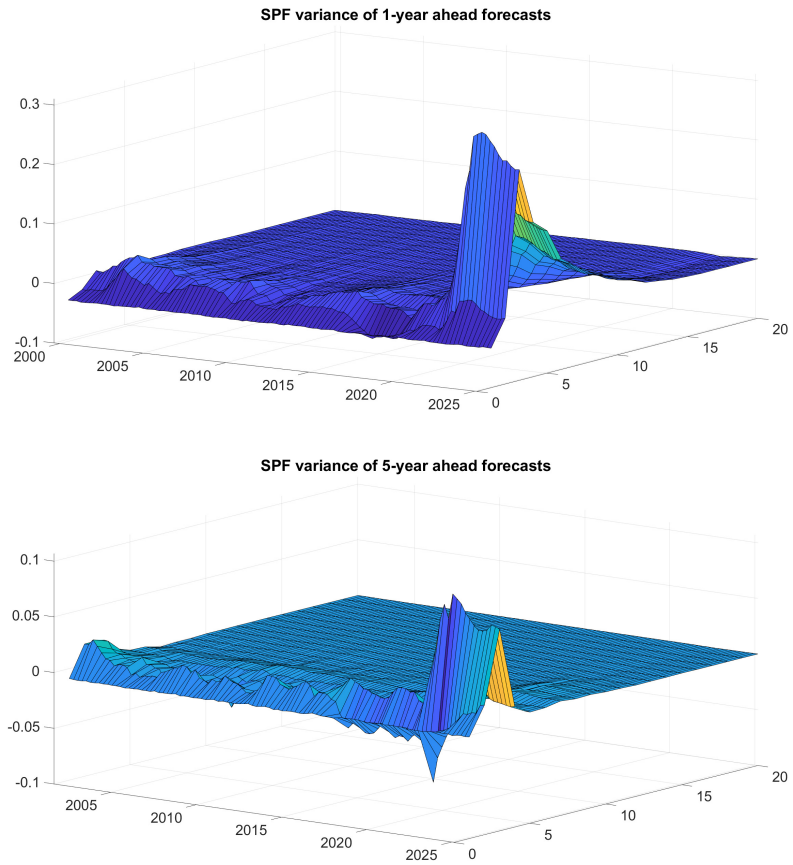


Notes: The figure shows impulse response functions from the TVP-SVAR-SV to an oil supply news shock of Känzig (2021) over the period from 2001Q3 (2005Q1 for the 5Y5Y ILS forward) to 2025Q2. The shock has been normalised to generate a 10% increase in the Brent oil price in each period, allowing the estimated elasticities to be comparable over time. The responses are shown in levels.

Figures 3 and 4 contain the central results on expectation formation. Short-run inflation expectations exhibit heightened sensitivity to energy shocks after 2022: the response of the 1Y1Y ILS forward increases markedly at the end of the sample, and the SPF

one-year-ahead expectations – which barely reacted to oil supply shocks over most of the sample – display a pronounced spike in the post-pandemic sample, remaining significantly above the historical pass-through even in mid-2025. The consistency between market- and survey-based measures suggests that our finding of more responsive short-run expectations is not an artefact of risk premia embedded in swap rates and calls for vigilance and real-time monitoring of second-round effects stemming from oil price shocks in such an environment. However, long-run inflation expectations appear to be better anchored: the responses of the 5Y5Y ILS forward and the SPF five-year ahead expectations have largely normalised by the end of the sample after the heightened pass-through observed during 2021–2023.

Figure 5: Time-varying impulse responses of disagreement about inflation expectations to an oil supply news shock

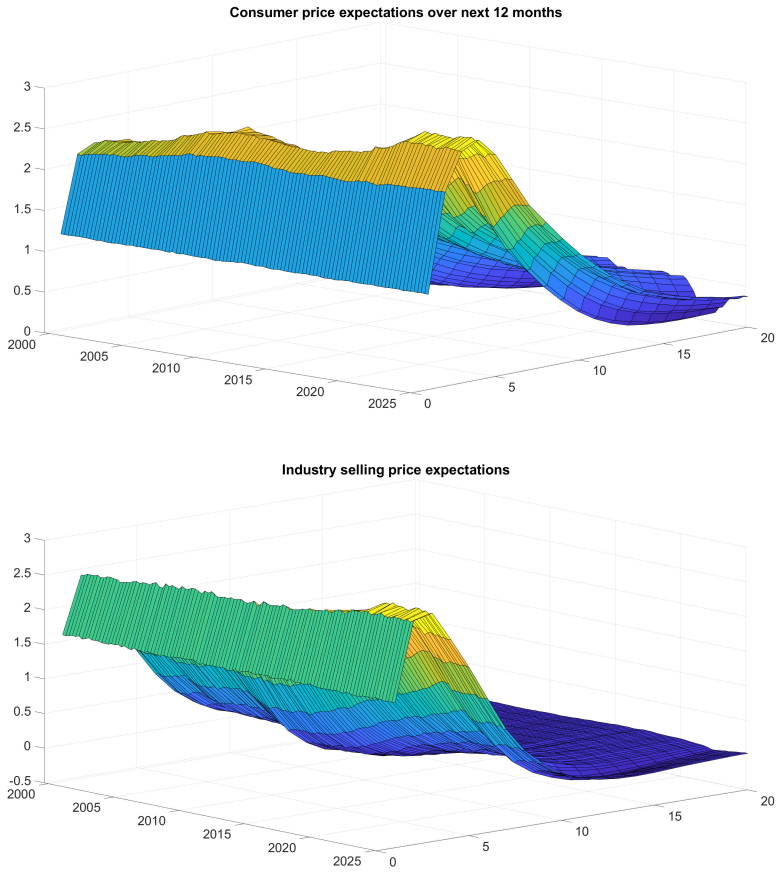


Notes: The figure shows impulse response functions from the TVP-SVAR-SV to an oil supply news shock of Känzig (2021) over the period from 1999Q3 (2001Q3 for the five-year horizon) to 2025Q2. Disagreement is measured by the cross-sectional variance of individual SPF point forecasts of inflation one year (top panel) and five years (bottom panel) ahead, in squared percentage points. The shock has been normalised to generate a 10% increase in the Brent oil price in each period, allowing the estimated elasticities to be comparable over time. The responses are shown in levels.

Figure 5 looks behind these averages at the disagreement among professional forecasters, measured by the cross-sectional variance of individual SPF point forecasts (Mankiw et al., 2003). Over most of the sample, oil supply shocks had little effect on the disagreement about one-year-ahead inflation, with responses close to zero. In the post-pandemic period, however, the response has increased sharply, peaking at around 0.25 within the first quarters after the shock and fading out after about two years, and it remains elevated in mid-2025. Oil supply shocks have therefore not only shifted the average short-run inflation expectations of professional forecasters, but also widened the dispersion of their views, pointing to higher uncertainty about the near-term inflation outlook when such shocks hit. The response of disagreement concerning five-year-ahead inflation is considerably smaller, with a peak of around 0.07, roughly a quarter of that at the one-year horizon. It has nonetheless remained elevated since 2022 relative to the pre-pandemic period, even though the response of average long-run expectations has largely normalised. This points to a residual sensitivity of long-run inflation beliefs to oil supply shocks that warrants continued monitoring.

The price expectations of consumers and firms corroborate these findings (Figure 6). Both consumers' price expectations over the next 12 months and industry selling price expectations respond strongly to oil supply shocks throughout the sample, in line with the evidence that household inflation expectations closely track oil prices (Coibion and Gorodnichenko, 2015), which plausibly reflects the high salience of energy prices in household budgets and firms' input costs. In the post-2022 period, however, the pass-through to both measures has become somewhat larger and more persistent, consistent with the heightened sensitivity of the SPF and market-based measures documented above. Since both measures are balance statistics, their magnitudes are not directly comparable with those of the ILS and SPF measures. Taken together, the evidence suggests that the increased sensitivity of short-run inflation expectations to energy shocks is not confined to financial markets, but extends to professional forecasters, consumers, and firms.

Figure 6: Time-varying impulse responses of consumer and firm price expectations to an oil supply news shock

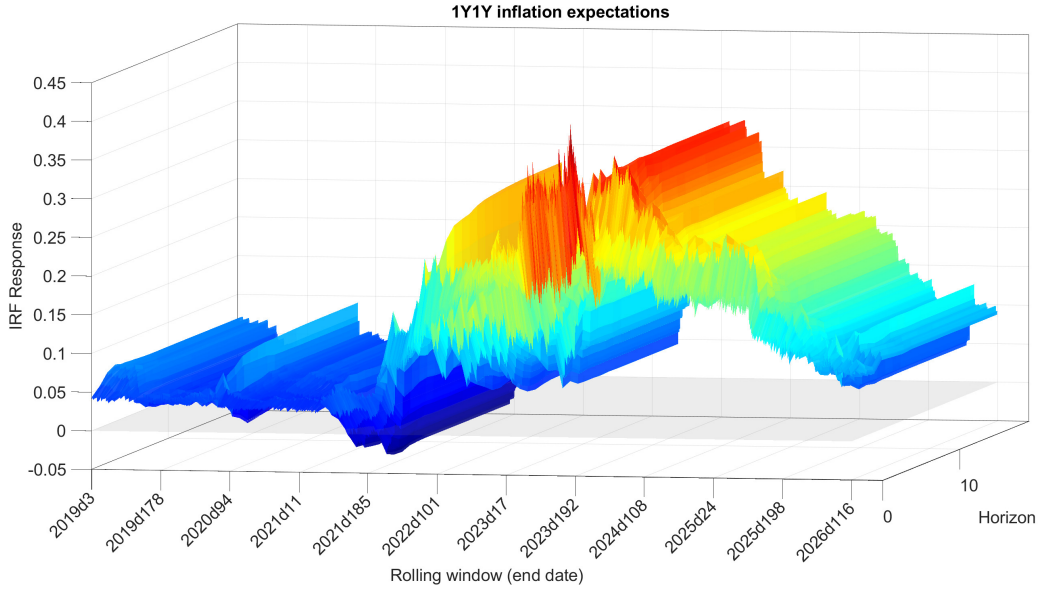


Notes: The figure shows impulse response functions of consumers' price expectations over the next 12 months (top panel) and industry selling price expectations (bottom panel) from the TVP-SVAR-SV to an oil supply news shock of Känzig (2021) over the period from 1999Q3 to 2025Q2. Both series are taken from the European Commission's Business and Consumer Surveys and are measured as balance statistics. The shock has been normalised to generate a 10% increase in the Brent oil price in each period, allowing the estimated elasticities to be comparable over time. The responses are shown in levels.

4.2 Real-time monitoring of the pass-through to inflation expectations

The quarterly evidence ends in 2025Q2 and is therefore uninformative about the episode triggered by the war in Iran. The rolling estimates from the daily Bayesian SVAR fill this gap. Figure 7 shows the response of the 1Y1Y ILS forward to the oil supply shock across rolling windows. The estimates confirm the heightened pass-through to short-run expectations after 2022: the response is subdued in windows ending before 2021, rises sharply in windows spanning the 2021–2023 surge, and moderates gradually thereafter. Notably, the most recent windows signal a renewed, albeit so far modest, increase in the

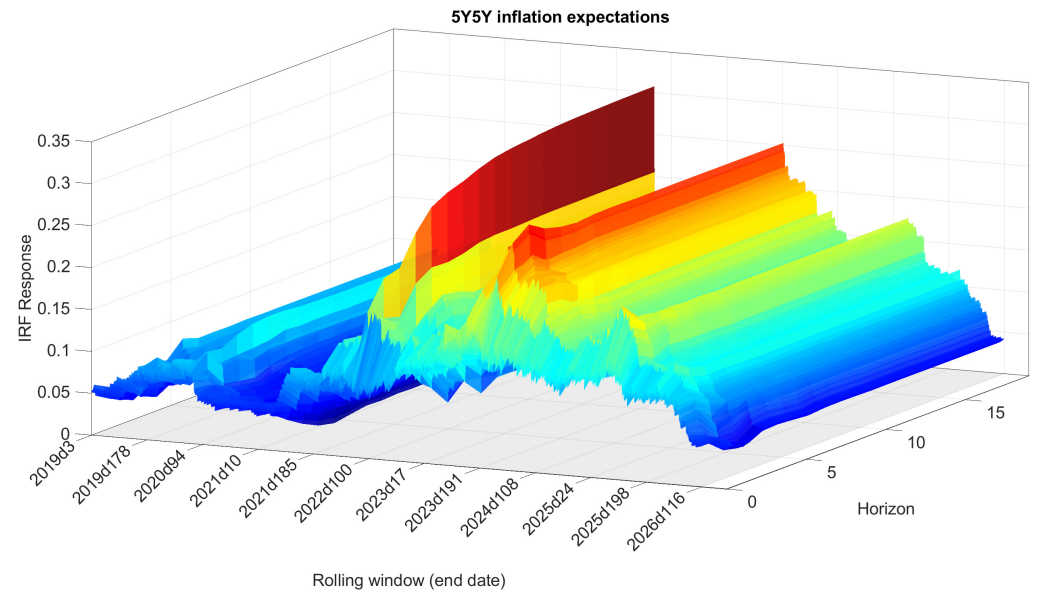
Figure 7: Rolling estimates of the response of the 1Y1Y ILS forward to an oil supply shock



Notes: The figure shows impulse response functions to an oil supply shock from the daily Bayesian SVAR, estimated over rolling windows of 260 days from 2 January 2018 to 17 June 2026. The shock has been normalised to generate a 10% increase in the Brent oil price in each period, allowing the estimated elasticities to be comparable over time. The responses are cumulative.

pass-through since the outbreak of the war in Iran.

Figure 8: Rolling estimates of the response of the 5Y5Y ILS forward to an oil supply shock

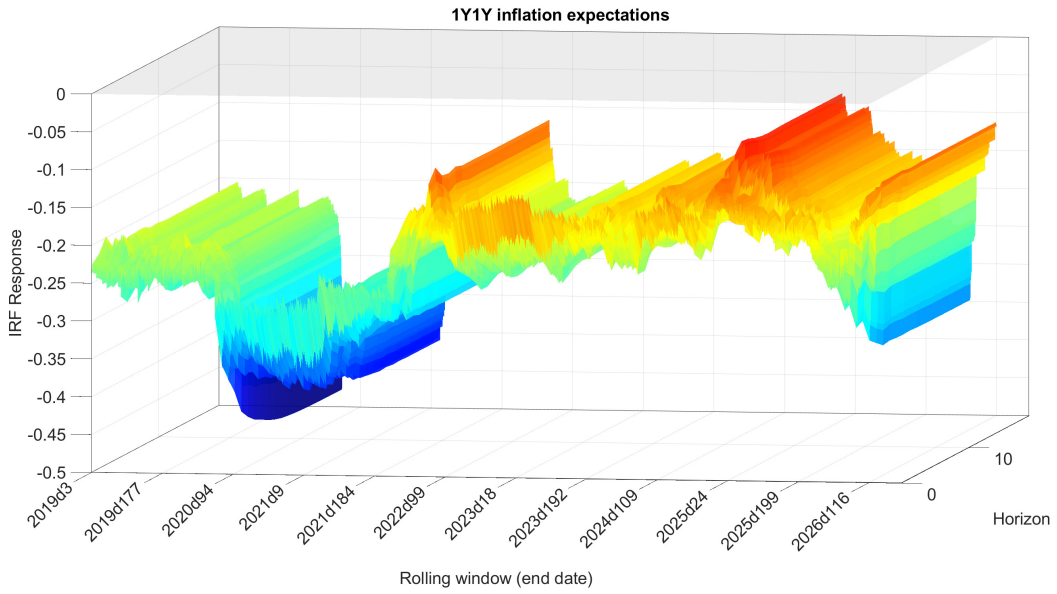


Notes: The figure shows impulse response functions to an oil supply shock from the daily Bayesian SVAR, estimated over rolling windows of 260 days from 2 January 2018 to 17 June 2026. The shock has been normalised to generate a 10% increase in the Brent oil price in each period, allowing the estimated elasticities to be comparable over time. The responses are cumulative.

Long-run expectations tell a different story. As shown in Figure 8, the response of the 5Y5Y ILS forward was elevated in windows covering the 2021–2023 episode, but it has

largely normalised in line with historical regularities observed in the pre-pandemic period – long-run expectations have been essentially immune to the recent oil shocks.

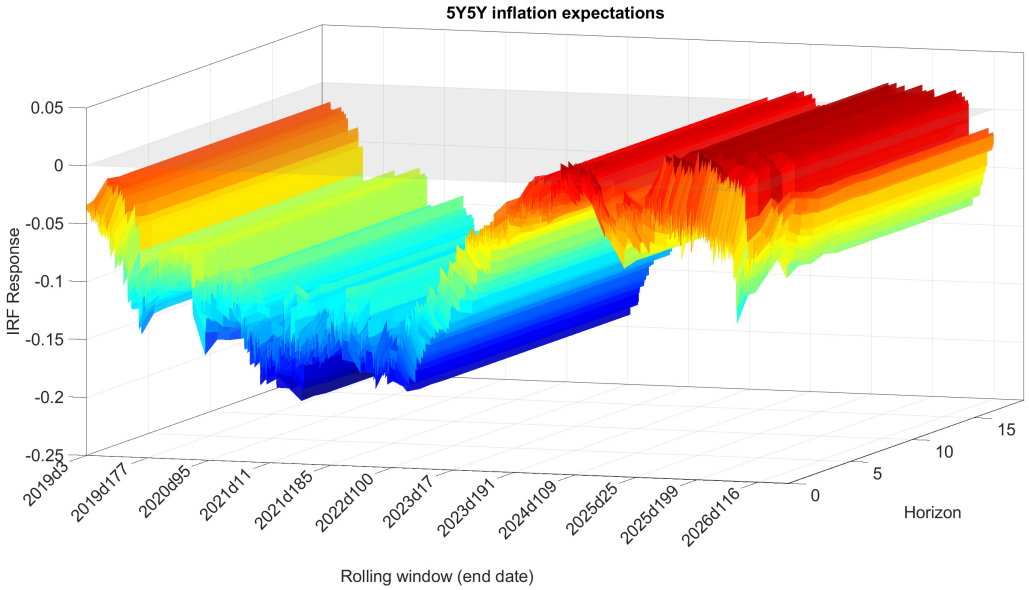
Figure 9: Rolling estimates of the response of the 1Y1Y ILS forward to a euro area monetary policy shock



Notes: The figure shows impulse response functions to a monetary policy shock from the daily Bayesian SVAR, estimated over rolling windows of 260 days from 2 January 2018 to 17 June 2026. The shock has been normalised to generate a 25-basis-point increase in the OIS rate in each period, allowing the estimated elasticities to be comparable over time. The responses are cumulative.

Figures 9 and 10 shed light on one mechanism behind this anchoring, as our setup also allows us to capture the impact of monetary policy embedded in the market pricing of OIS rates. Short-run inflation compensation has become more sensitive to monetary policy since the outbreak of the war in Iran. After weakening in the windows covering 2022–2025, the response of the 1Y1Y ILS forward to a restrictive euro area monetary policy shock strengthened markedly in the most recent windows, more than doubling relative to 2025 and approaching the levels observed in the windows covering 2020–2021. This may be related to the shift in the ECB's communication and reaction function, which has made it easier for market participants to anticipate and understand the ECB's response to shocks that threaten the inflation outlook. In July 2022, the ECB moved to a data-dependent, meeting-by-meeting approach to interest rate decisions and, in March 2023, clarified that its decisions would be based on its assessment of the inflation outlook, the dynamics of underlying inflation and the strength of monetary policy transmission (European Central

Figure 10: Rolling estimates of the response of the 5Y5Y ILS forward to a euro area monetary policy shock



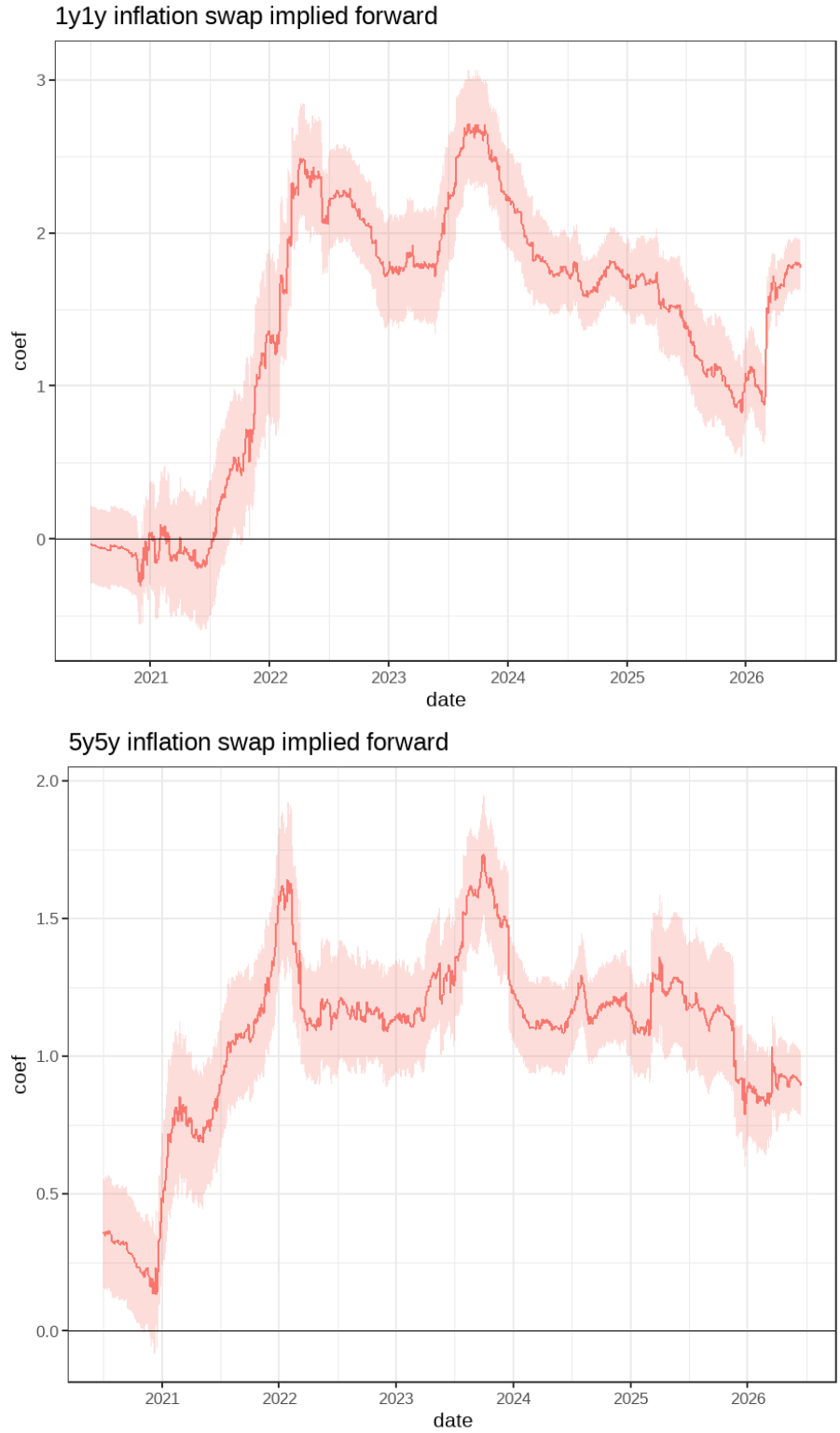
Notes: The figure shows impulse response functions to a monetary policy shock from the daily Bayesian SVAR, estimated over rolling windows of 260 days from 2 January 2018 to 17 June 2026. The shock has been normalised to generate a 25-basis-point increase in the OIS rate in each period, allowing the estimated elasticities to be comparable over time. The responses are cumulative.

Bank, 2025). Financial markets have rapidly internalised this reaction function (Lane, 2024): the policy rate response to inflation perceived by professional forecasters increased substantially after the liftoff in July 2022, while the sensitivity of bond yields to inflation surprises rose and has remained elevated since (Pflueger, 2025). Against this background, markets priced in the expected policy response to the energy shock triggered by the war in Iran, which contributed to compressing short-run inflation expectations well before the ECB raised its policy rates in June 2026. The response of long-run inflation compensation to policy shocks, in turn, has been broadly in line with historical regularities during 2026, with a slight increase in the pass-through after the rate hike in June.

4.3 Anchoring regressions

The Bernanke-style regressions corroborate these findings. Figure 11 plots the rolling estimates of β from equation (15). For the 1Y1Y horizon, the coefficient is statistically indistinguishable from zero until mid-2021, before rising steeply during 2022, peaking in 2023, and moderating thereafter. However, it remains well above its pre-pandemic level.

Figure 11: Anchoring regressions: response of ILS implied forwards to the oil supply shock

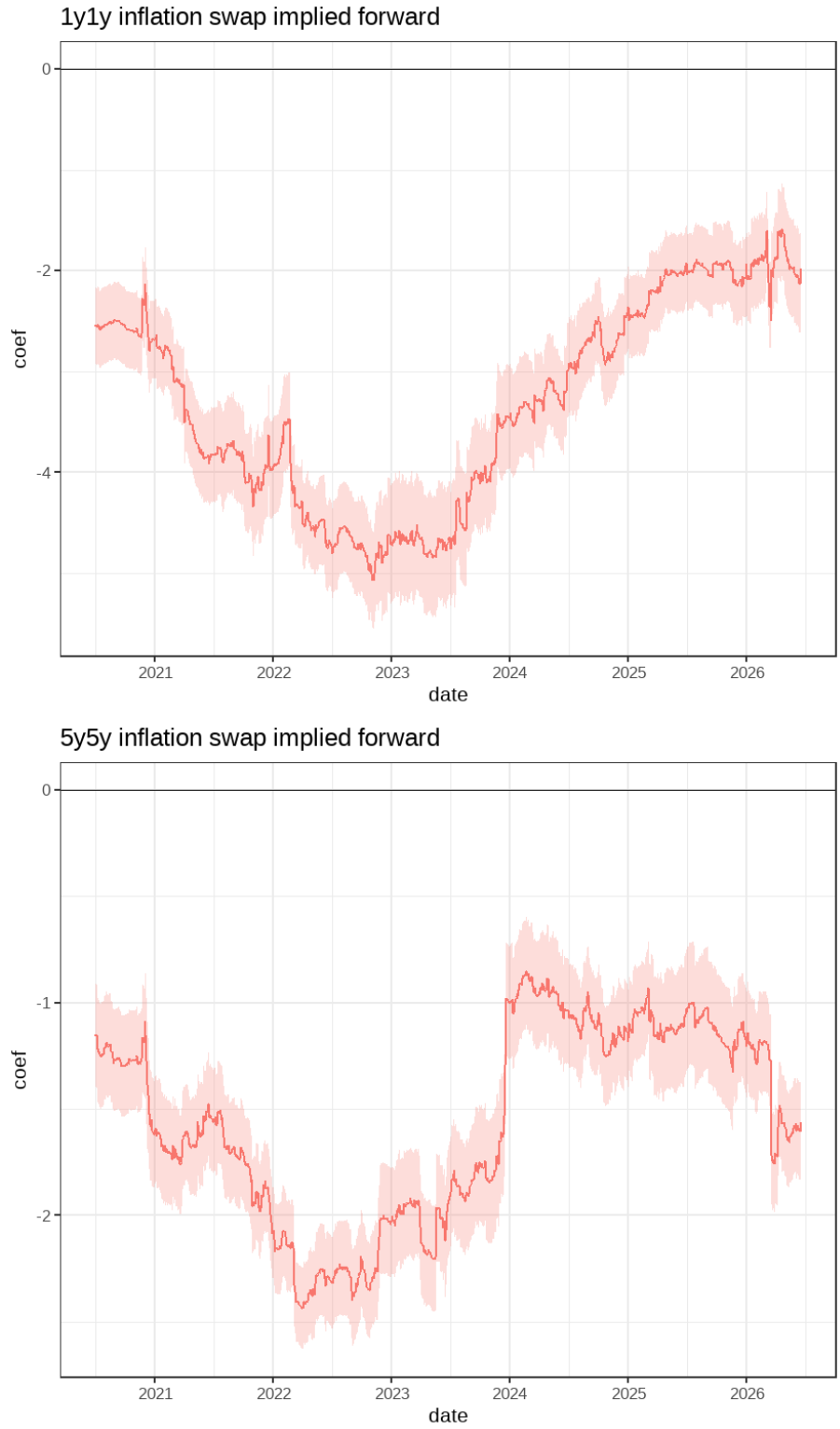


Notes: The figure shows rolling regression estimates of the effect of the oil supply shock on the 1Y1Y and 5Y5Y inflation swap implied forward rates. The high-frequency shock is taken from the daily Bayesian SVAR and is normalised by its standard deviation. Estimates are obtained using a 260-day rolling window. The solid line denotes the estimated coefficient, while the shaded area represents 95% confidence intervals.

The most recent windows display a renewed uptick in the wake of the war in Iran, in line with our findings from the daily Bayesian SVAR. For the 5Y5Y horizon, the coefficient is positive but considerably smaller and has gradually been declining towards the end of the sample.

Figure 12 reports the analogous estimates for the monetary policy shock. The coefficient is negative throughout and at both horizons: restrictive policy surprises consistently lower inflation compensation. Its absolute value peaked during 2022–2023, precisely when inflation was elevated, indicating that policy had particularly strong traction on inflation beliefs during the tightening cycle – consistent with the argument that central banks can act forcefully at a comparatively low cost when large shocks threaten the anchoring of expectations (Ascari et al., 2025; Forbes et al., 2025; Zlobins, 2025). The sensitivity has since moderated as inflation normalised.

Figure 12: Anchoring regressions: response of ILS implied forwards to the euro area monetary policy shock



Notes: The figure shows rolling regression estimates of the effect of the monetary policy shock on the 1Y1Y and 5Y5Y inflation swap implied forward rates. The high-frequency shock is taken from the daily Bayesian SVAR and is normalised by its standard deviation. Estimates are obtained using a 260-day rolling window. The solid line denotes the estimated coefficient, while the shaded area represents 95% confidence intervals.

4.4 Robustness

We subject our results to three robustness checks, for which the corresponding figures are reported in Appendix A. The first two concern the real-time framework. First, we assess whether the heightened sensitivity of market-based inflation expectations reflects genuine revisions of inflation beliefs or changes in the compensation that investors demand for bearing inflation risk. Second, we examine whether our findings carry over to natural gas supply shocks, which were at the centre of the 2021–2023 energy crisis in the euro area. Third, we verify whether the time-varying pass-through documented in Section 4.1 is robust to an alternative identification of the oil supply shock.

Genuine inflation expectations and inflation risk premia. Market-based measures of inflation compensation embed both genuine beliefs about the future path of inflation and inflation risk premia (Camba-Méndez and Werner, 2017). A stronger response of ILS forwards to oil supply shocks could therefore reflect higher compensation for upside inflation risk rather than a revision of expected inflation, with markedly different implications for the anchoring of expectations. To distinguish between the two, we use the daily decomposition of euro area ILS rates into an expected inflation component and an inflation risk premium obtained from the affine term structure model of Grønlund et al. (2024). We then re-estimate the rolling daily Bayesian SVAR and the anchoring regressions, replacing the 1Y1Y and 5Y5Y ILS implied forward rates with each of the two components in turn, while leaving the identifying restrictions in Table 1 unchanged. Since each component enters a separately estimated system with its own identified shocks, and the term structure model does not fit ILS rates exactly, the responses of the two components need not add up to the response of the ILS forward in the baseline specification.

The results confirm that the heightened post-2022 sensitivity of short-run inflation expectations is not merely an artefact of risk premia. As shown in Figure A.1, the response of genuine 1Y1Y inflation expectations to an oil supply shock follows the same time profile as in the baseline: it is negligible in windows ending before 2022, rises sharply in windows spanning the 2021–2023 inflation surge, and moderates thereafter, while remaining above

its pre-pandemic level. At its peak, the response of the genuine component is about one-third of that of the 1Y1Y ILS forward in the baseline, while inflation risk premia display a larger response (Figure A.3). The anchoring regressions tell the same story (Figure A.5): the coefficient on the oil supply shock for genuine 1Y1Y expectations is statistically indistinguishable from zero until early 2021, peaks around the turn of 2023–2024 and declines through 2025, before rebounding in the most recent windows following the outbreak of the war in Iran, although it remains below its 2022–2023 levels. The renewed uptick in the sensitivity of short-run inflation compensation documented in Section 4.3 therefore also reflects genuine revisions of inflation beliefs rather than solely a repricing of inflation risk.

Turning to long-run expectations, the decomposition lends further support to the conclusion that long-run inflation expectations remain well anchored. The response of genuine 5Y5Y inflation expectations to an oil supply shock is an order of magnitude smaller than that of the 5Y5Y ILS forward in the baseline (Figure A.1), implying that the bulk of the response of long-horizon inflation compensation reflects inflation risk premia (Figure A.3). Consistently, the coefficient in the anchoring regression for genuine 5Y5Y expectations is about one-tenth of that for the 5Y5Y ILS forward (Figure A.5). Strictly speaking, the coefficient remains statistically different from zero after 2021 and edges up in the most recent windows, pointing to a small residual sensitivity of long-run beliefs to oil supply shocks, warranting continued monitoring.

Finally, restrictive monetary policy shocks lower both components of inflation compensation at both horizons and in all rolling windows (Figures A.2 and A.4). The anchoring regressions (Figures A.6 and A.8) show that the sensitivity of both components to policy surprises was greatest during 2021–2023, when inflation was elevated, and has moderated since, with the sensitivity of long-run inflation risk premia approaching zero in the most recent windows. Monetary policy thus contributes to the anchoring of inflation expectations both by lowering genuine expectations and by compressing the compensation that investors demand for inflation risk.

Gas supply shocks. The 2021–2023 energy crisis in the euro area was driven to a large extent by natural gas rather than oil prices, and the macroeconomic effects of natural gas shocks differ materially from those of oil shocks (Alessandri and Gazzani, 2025). We therefore replace the Brent oil price in the daily Bayesian SVAR with the Dutch TTF natural gas price and identify a gas supply shock using the same sign restrictions as for the oil supply shock in Table 1. The shock is normalised to generate a 10% increase in the TTF gas price in each window.

Figure A.9 shows that the response of the 1Y1Y ILS forward to gas supply shocks strengthened after 2022, reaching its largest values in windows ending in 2024 and early 2025, and has picked up again in the most recent windows after a temporary decline in the second half of 2025. By contrast, the response of the 5Y5Y ILS forward peaked in the windows covering the 2022–2023 episode and has since normalised towards the end of the sample, in line with the evidence for oil supply shocks. The anchoring regressions (Figure A.10) corroborate both findings. The 1Y1Y coefficient, close to zero before 2021, rises steeply through 2021–2022, dips in late 2025 and rebounds in 2026 to levels comparable with its 2022 peak – a sharper renewed increase than in the case of oil. The 5Y5Y coefficient, by contrast, also points to a normalisation towards the end of the sample. Thus, as for oil, gas supply shocks have had a heightened effect on short-run inflation expectations after 2022, while long-run inflation expectations have remained anchored.

Alternative identification of the oil supply shock. Our quarterly evidence relies on the high-frequency oil supply news shock of Känzig (2021). As an alternative, we identify a flow supply shock in the spirit of Kilian and Murphy (2014), who disentangle oil supply shocks from flow demand and storage (speculative) demand shocks using sign restrictions in a model of the global oil market. To this end, we augment the benchmark TVP-SVAR-SV with the world industrial production index of Baumeister and Hamilton (2019), world oil production from the US Energy Information Administration (EIA) and world oil inventories from the OECD. All three variables enter the model in log-differences. We exclude the oil supply news shock series and jointly identify the three shocks using the sign restrictions summarised in Table 2. An adverse flow supply shock raises the Brent oil

price while lowering world oil production and world industrial production. A positive flow demand shock raises the oil price, world oil production and world industrial production alike. A positive storage demand shock, which reflects forward-looking demand for oil inventories, raises the oil price, world oil production, and oil inventories, while lowering world industrial production. All restrictions are imposed to hold on impact only, while the responses of the euro area variables are left unrestricted. As in the baseline, the flow supply shock is normalised to generate a 10% increase in the Brent oil price in each period.

Table 2: Identification of the TVP-SVAR-SV with global oil market variables: sign restrictions

Variable	Flow supply	Flow demand	Storage demand
Real GDP			
HICP inflation			
3-month EURIBOR			
EUR/USD exchange rate			
Brent oil price	+	+	+
World industrial production	−	+	−
World oil production	−	+	+
World oil inventories			+

Notes: The table reports the sign restrictions used to jointly identify the flow supply, flow demand, and storage demand shocks in the TVP-SVAR-SV, following Kilian and Murphy (2014). The restrictions refer to an adverse flow supply shock and to positive flow demand and storage demand shocks. All restrictions are imposed to hold on impact only. Blank entries denote unrestricted responses.

Figure A.11 shows that the alternative identification confirms our central finding on headline inflation: the response of HICP inflation spikes during the recent inflation surge and subsequently falls back, in line with the normalisation of the pass-through documented in Section 4.1. The contraction in real GDP is considerably larger than under the baseline identification and has deepened in recent years. In addition, the response of the EUR/USD exchange rate remains non-negative over the entire sample, so that the depreciation of the euro following oil supply shocks in recent years – and hence the exchange rate amplification channel – does not emerge under this identification. One possible interpretation is that the two identification schemes capture different disturbances: news about future oil supply, which is priced in by financial markets on impact, as opposed to realised disruptions to the flow of oil.

Overall, the robustness checks confirm our main conclusions. The heightened post-

2022 sensitivity of short-run inflation expectations to energy shocks, including its renewed increase since the outbreak of the war in Iran, is present in genuine inflation expectations and not only in inflation risk premia, while also extending to gas supply shocks. At the same time, the limited response of genuine long-run expectations to oil supply shocks and the normalisation of the response of long-run inflation compensation to gas supply shocks support the conclusion that long-run inflation expectations remain well anchored. The time-varying pass-through of oil supply shocks to headline inflation is also robust to an alternative identification of the shock.

5 Conclusions

This paper documents the pass-through of oil supply shocks to inflation and inflation expectations in the euro area, combining a quarterly TVP-SVAR-SV identified with high-frequency oil supply news with a daily Bayesian SVAR and Bernanke-style regressions that allow the pass-through to be monitored in real time. Four findings stand out. First, the pass-through of oil supply shocks to headline inflation was largely in line with historical regularities by 2025, with peak effects materialising after four to five quarters, although second-round effects via wages were still unfolding. Second, short-run inflation expectations exhibit heightened sensitivity to energy shocks after 2022, and the real-time framework signals a slight further increase since the outbreak of the war in Iran. This change is not confined to financial markets, as the pass-through to the expectations of professional forecasters, consumers, and firms has also become somewhat larger and more persistent after 2022. Third, long-run inflation expectations have been more firmly anchored and show a limited response to recent oil shocks. Fourth, market pricing of the expected monetary policy response helps contain short-run inflation expectations.

These results carry several implications for monetary policy. Looking through supply-side disturbances remains a reasonable default for shocks of a typical size, as the normalisation of the pass-through by 2025 attests. That said, the stronger and more persistent response of wages implies that second-round effects can materialise with a considerable lag, even after the pass-through to headline inflation has faded. Moreover, the heightened

post-2022 sensitivity of short-run expectations implies that the room for complacency is narrower than before the pandemic: when large and persistent shocks hit, the risk of second-round effects via the expectations channel is material, and the case for a forceful response is correspondingly stronger. The daily monitoring toolkit proposed here provides a timely read on precisely this margin. As regards the current episode, the evidence to date points to a modest increase in the sensitivity of short-run expectations since the outbreak of the war in Iran, while long-run expectations remain well anchored – a constellation that warrants close monitoring rather than an immediate reassessment of the policy stance.

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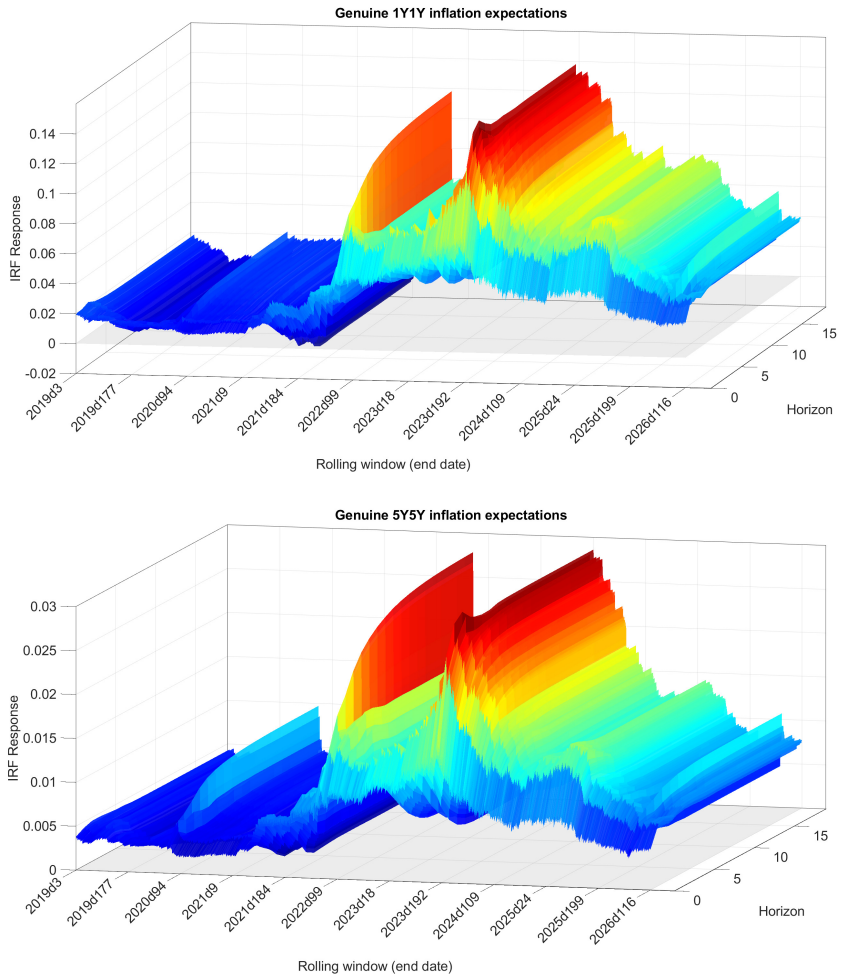
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A Robustness checks

This appendix reports the figures underlying the three robustness checks discussed in Section 4.4. Appendix A.1 re-estimates the daily Bayesian SVAR and the anchoring regressions separately for genuine inflation expectations and inflation risk premia, i.e. the components of ILS implied forward rates estimated with the affine term structure model of Grønlund et al. (2024). Appendix A.2 replaces the Brent oil price with the TTF natural gas price and reports the responses of ILS implied forwards to a gas supply shock. Finally, Appendix A.3 reports the time-varying impulse responses from the TVP-SVAR-SV to a flow supply shock identified with sign restrictions in the spirit of Kilian and Murphy (2014), as an alternative to the oil supply news shock of Känzig (2021).

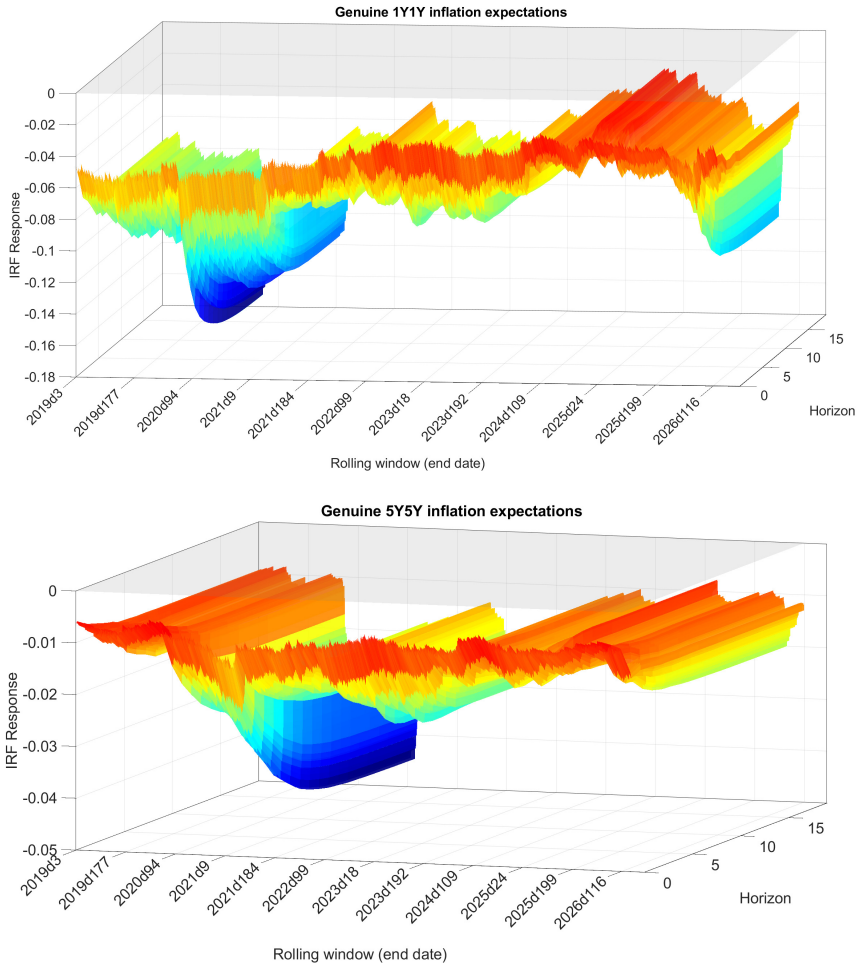
A.1 Genuine inflation expectations and inflation risk premia

Figure A.1: Rolling estimates of the response of genuine inflation expectations to an oil supply shock



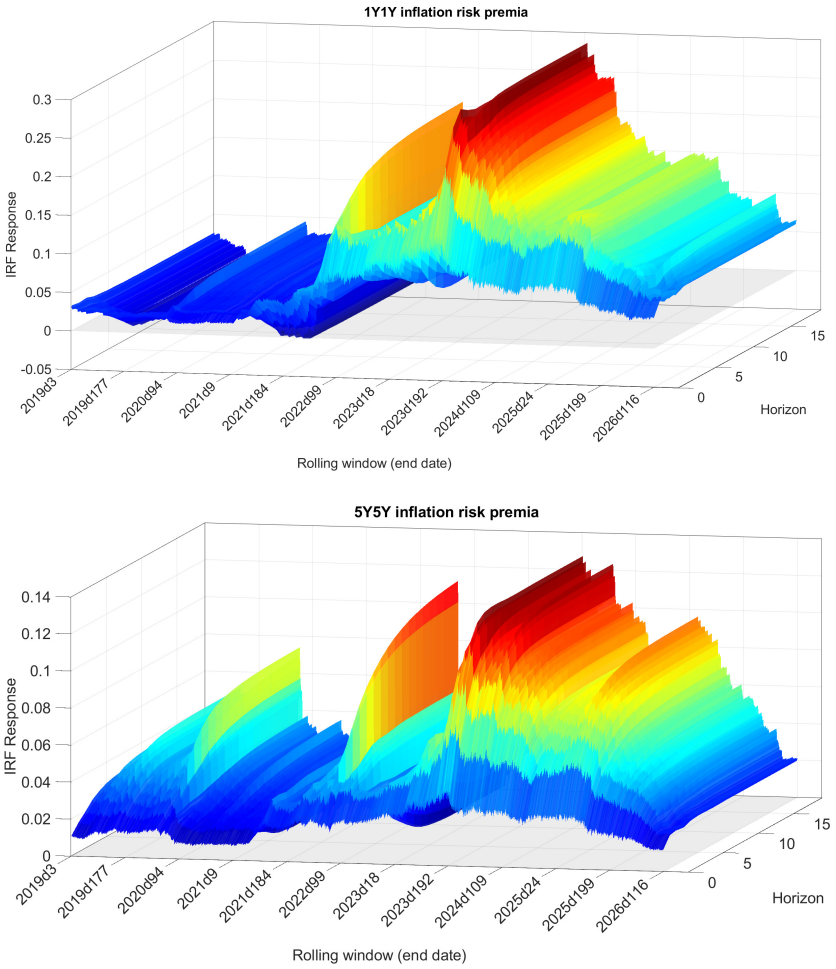
Notes: The figure shows impulse response functions of genuine 1Y1Y (top panel) and 5Y5Y (bottom panel) inflation expectations to an oil supply shock from the daily Bayesian SVAR, estimated over rolling windows of 260 days from 2 January 2018 to 17 June 2026. Genuine inflation expectations refer to the expected inflation component of ILS implied forward rates estimated by Grønlund et al. (2024). The shock has been normalised to generate a 10% increase in the Brent oil price in each period, allowing the estimated elasticities to be comparable over time. The responses are cumulative.

Figure A.2: Rolling estimates of the response of genuine inflation expectations to a euro area monetary policy shock



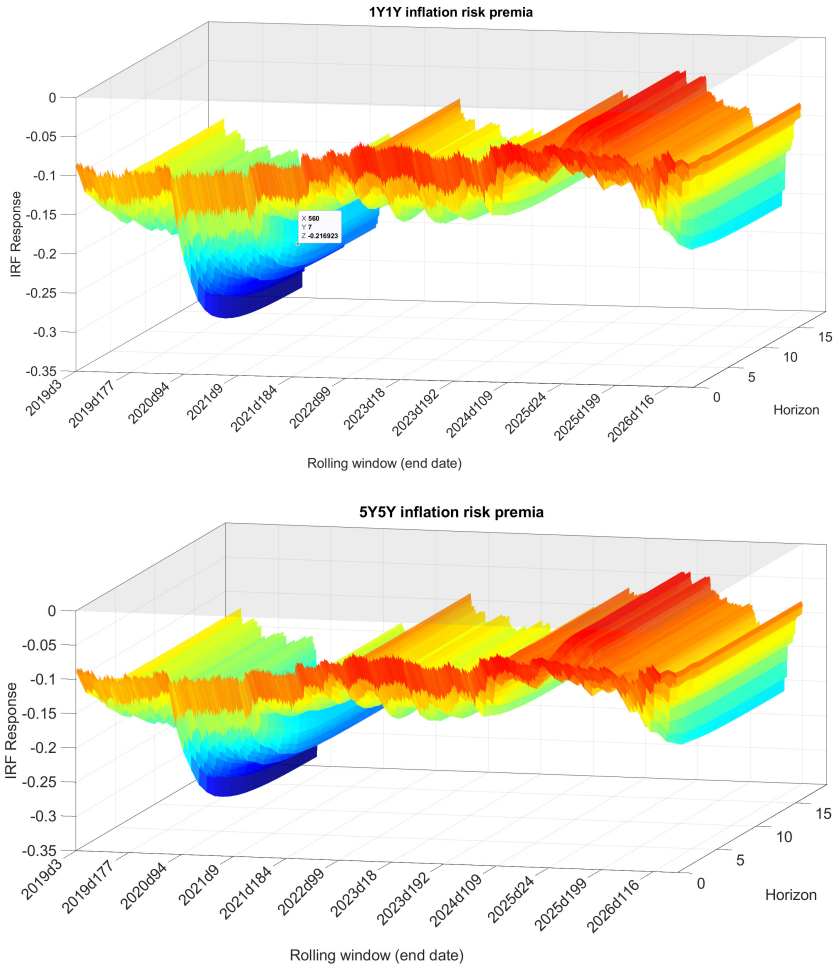
Notes: The figure shows impulse response functions of genuine 1Y1Y (top panel) and 5Y5Y (bottom panel) inflation expectations to a monetary policy shock from the daily Bayesian SVAR, estimated over rolling windows of 260 days from 2 January 2018 to 17 June 2026. Genuine inflation expectations refer to the expected inflation component of ILS implied forward rates estimated by Grønlund et al. (2024). The shock has been normalised to generate a 25-basis-point increase in the OIS rate in each period, allowing the estimated elasticities to be comparable over time. The responses are cumulative.

Figure A.3: Rolling estimates of the response of inflation risk premia to an oil supply shock



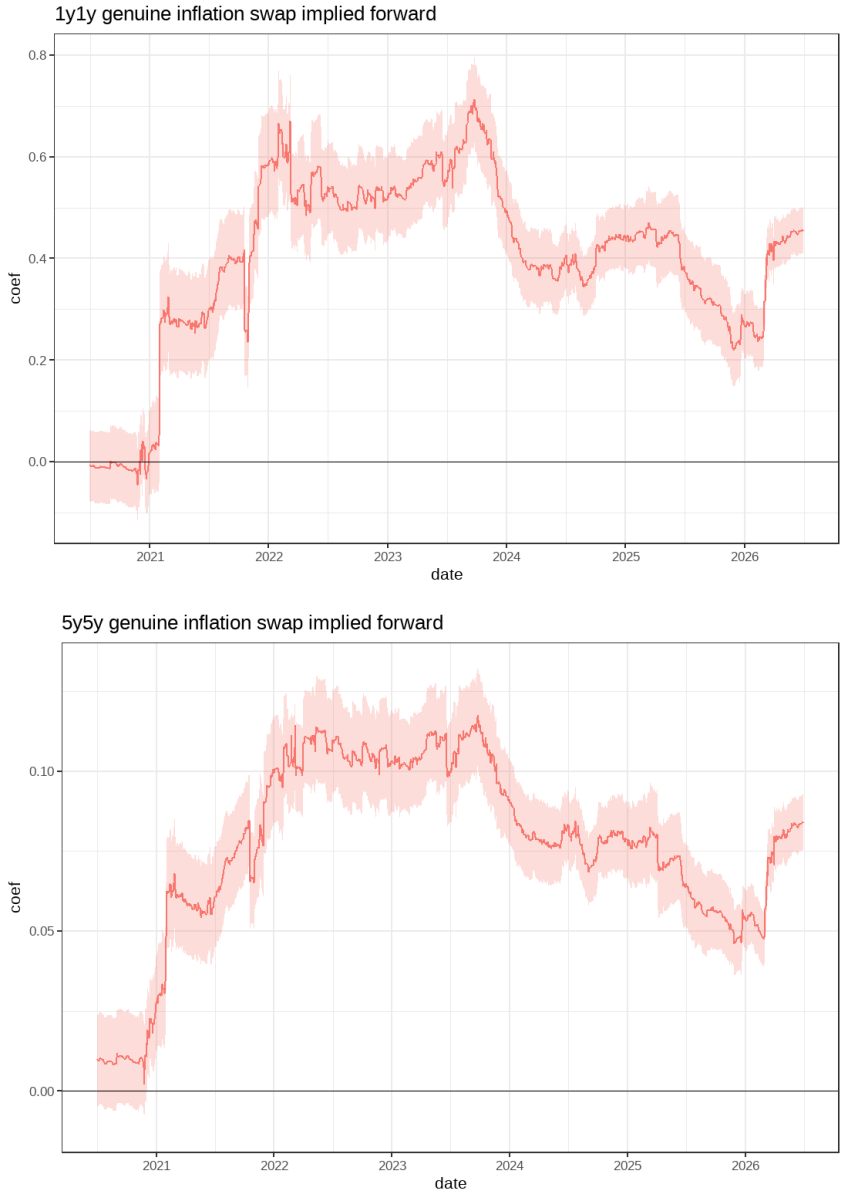
Notes: The figure shows impulse response functions of the inflation risk premia embedded in the 1Y1Y (top panel) and 5Y5Y (bottom panel) ILS implied forward rates to an oil supply shock from the daily Bayesian SVAR, estimated over rolling windows of 260 days from 2 January 2018 to 17 June 2026. Inflation risk premia are estimated by Grønlund et al. (2024). The shock has been normalised to generate a 10% increase in the Brent oil price in each period, allowing the estimated elasticities to be comparable over time. The responses are cumulative.

Figure A.4: Rolling estimates of the response of inflation risk premia to a euro area monetary policy shock



Notes: The figure shows impulse response functions of the inflation risk premia embedded in the 1Y1Y (top panel) and 5Y5Y (bottom panel) ILS implied forward rates to a monetary policy shock from the daily Bayesian SVAR, estimated over rolling windows of 260 days from 2 January 2018 to 17 June 2026. Inflation risk premia are estimated by Grønlund et al. (2024). The shock has been normalised to generate a 25-basis-point increase in the OIS rate in each period, allowing the estimated elasticities to be comparable over time. The responses are cumulative.

Figure A.5: Anchoring regressions: response of genuine inflation expectations to the oil supply shock



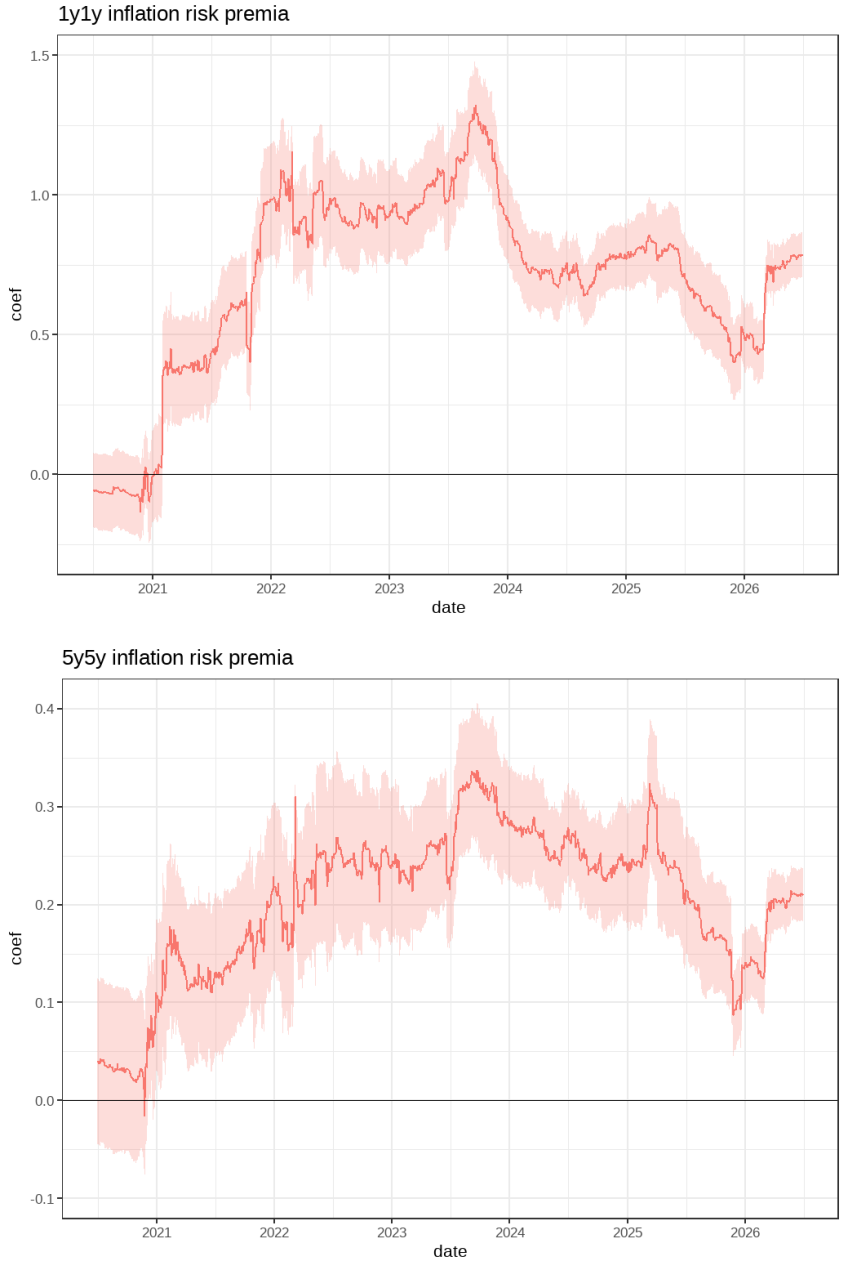
Notes: The figure shows rolling regression estimates of the effect of the oil supply shock on genuine 1Y1Y (top panel) and 5Y5Y (bottom panel) inflation expectations, i.e. the expected inflation component of ILS implied forward rates estimated by Grønlund et al. (2024). The high-frequency shock is taken from the daily Bayesian SVAR and is normalised by its standard deviation. Estimates are obtained using a 260-day rolling window. The solid line denotes the estimated coefficient, while the shaded area represents 95% confidence intervals.

Figure A.6: Anchoring regressions: response of genuine inflation expectations to the euro area monetary policy shock



Notes: The figure shows rolling regression estimates of the effect of the monetary policy shock on genuine 1Y1Y (top panel) and 5Y5Y (bottom panel) inflation expectations, i.e. the expected inflation component of ILS implied forward rates estimated by Grønlund et al. (2024). The high-frequency shock is taken from the daily Bayesian SVAR and is normalised by its standard deviation. Estimates are obtained using a 260-day rolling window. The solid line denotes the estimated coefficient, while the shaded area represents 95% confidence intervals.

Figure A.7: Anchoring regressions: response of inflation risk premia to the oil supply shock



Notes: The figure shows rolling regression estimates of the effect of the oil supply shock on the inflation risk premia embedded in the 1Y1Y (top panel) and 5Y5Y (bottom panel) ILS implied forward rates, as estimated by Grønlund et al. (2024). The high-frequency shock is taken from the daily Bayesian SVAR and is normalised by its standard deviation. Estimates are obtained using a 260-day rolling window. The solid line denotes the estimated coefficient, while the shaded area represents 95% confidence intervals.

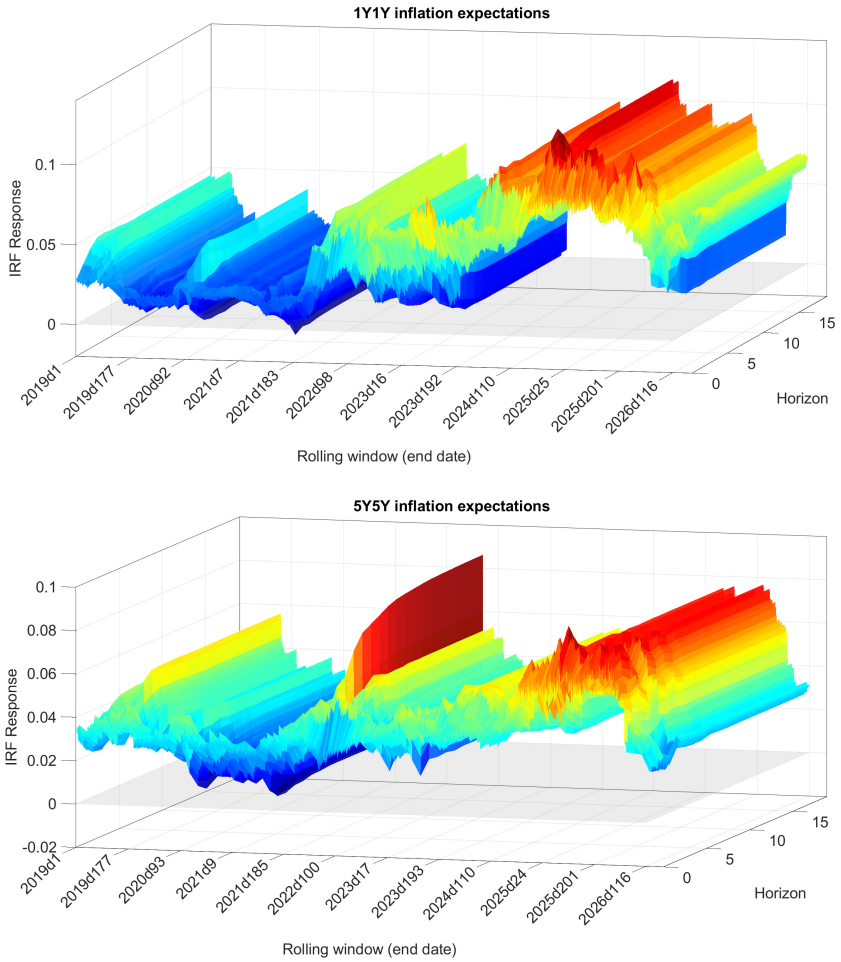
Figure A.8: Anchoring regressions: response of inflation risk premia to the euro area monetary policy shock



Notes: The figure shows rolling regression estimates of the effect of the monetary policy shock on the inflation risk premia embedded in the 1Y1Y (top panel) and 5Y5Y (bottom panel) ILS implied forward rates, as estimated by Grønlund et al. (2024). The high-frequency shock is taken from the daily Bayesian SVAR and is normalised by its standard deviation. Estimates are obtained using a 260-day rolling window. The solid line denotes the estimated coefficient, while the shaded area represents 95% confidence intervals.

A.2 Gas supply shocks

Figure A.9: Rolling estimates of the response of ILS implied forwards to a gas supply shock



Notes: The figure shows impulse response functions of the 1Y1Y (top panel) and 5Y5Y (bottom panel) ILS implied forward rates to a gas supply shock from the daily Bayesian SVAR, estimated over rolling windows of 260 days from 2 January 2018 to 17 June 2026. The shock has been normalised to generate a 10% increase in the TTF gas price in each period, allowing the estimated elasticities to be comparable over time. The responses are cumulative.

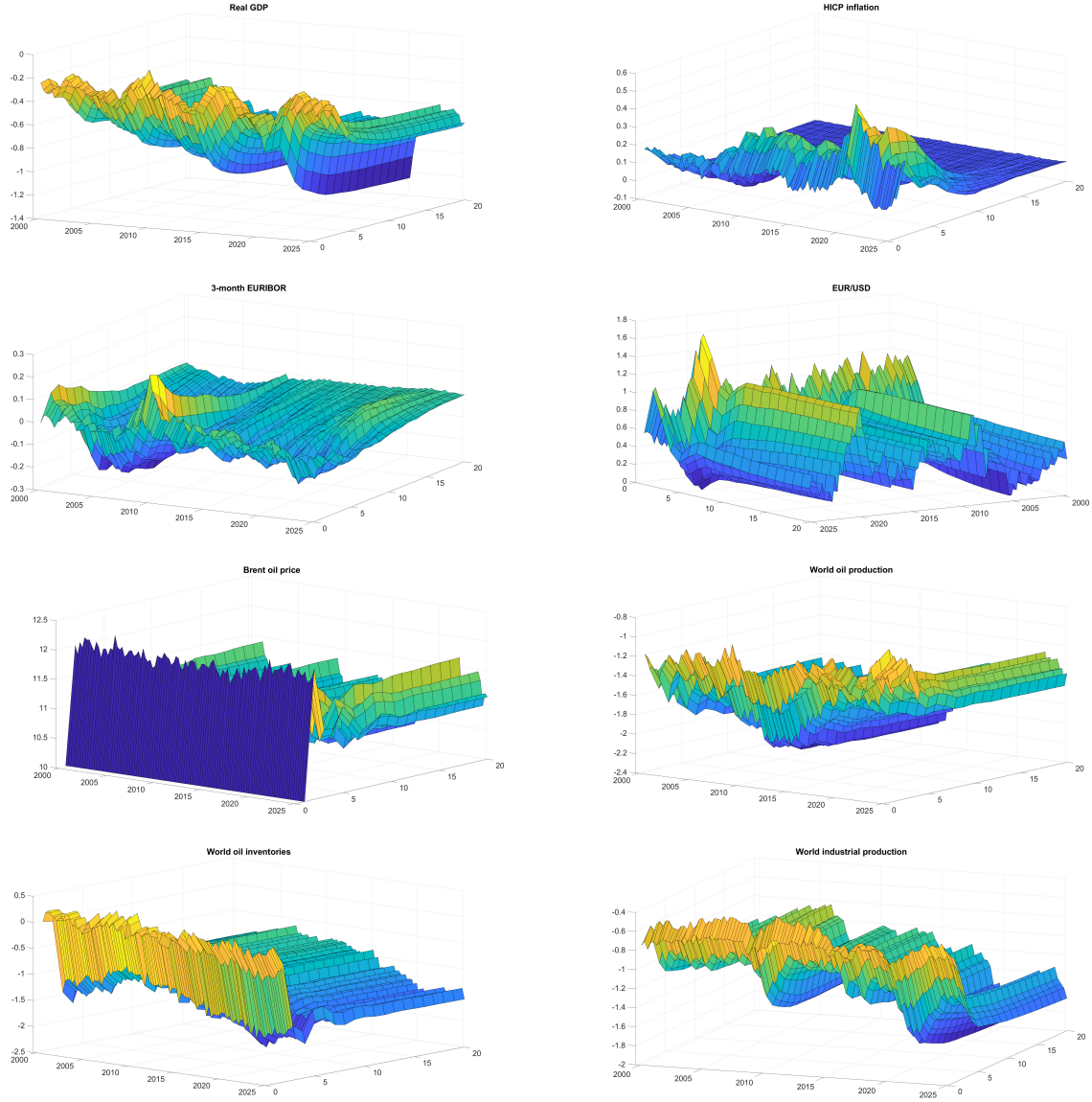
Figure A.10: Anchoring regressions: response of ILS implied forwards to the gas supply shock



Notes: The figure shows rolling regression estimates of the effect of the gas supply shock on the 1Y1Y (top panel) and 5Y5Y (bottom panel) inflation swap implied forward rates. The high-frequency shock is taken from the daily Bayesian SVAR and is normalised by its standard deviation. Estimates are obtained using a 260-day rolling window. The solid line denotes the estimated coefficient, while the shaded area represents 95% confidence intervals.

A.3 Alternative identification of the oil supply shock

Figure A.11: Time-varying impulse responses to a flow supply shock



Notes: The figure shows impulse response functions from the TVP-SVAR-SV to a flow supply shock identified via sign restrictions as in Kilian and Murphy (2014) over the period from 1999Q3 to 2025Q2. The benchmark specification is augmented with world oil production, world oil inventories and world industrial production, all of which enter the model in log-differences, while the oil supply news shock series of Känzig (2021) is excluded. The identifying sign restrictions are reported in Table 2. The shock has been normalised to generate a 10% increase in the Brent oil price in each period, allowing the estimated elasticities to be comparable over time. All responses are cumulative, except for those of HICP inflation and the 3-month EURIBOR, which are shown in levels.