Tyler Sotomayor
tyler.sotomayor@columbia.edu
www.tylersotomayor.com

COLUMBIA | ECONOMICS

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When the Message Meets the Moment
State-dependent Effects of Monetary Policy Surprises on the Term Structure of Inflation Expectations

Introduction

Anchoring inflation expectations is central to effective monetary policy. When expectations remain stable in the face of short-term fluctuations, policymakers can respond more forcefully to demand-driven recessions and less aggressively to supply-side inflation without risking credibility. As Bernanke (2022) argues, this flexibility supports better outcomes across the dual mandate. Expectations thus serve a dual role: they influence realized inflation and reflect how agents interpret central bank actions and communication.

Expectations also form across multiple horizons. The term structure of inflation expectations—spanning short-, medium-, and long-run beliefs—has emerged as a vital gauge of monetary policy credibility and effectiveness (Haubrich et al., 2011). Yet relatively little empirical work explores how this structure responds to different types of monetary surprises, especially across inflationary regimes.

This paper addresses that gap by building on the identification strategy of Jarociński and Karadi (2020), which separates monetary policy surprises into pure rate (MP) shocks—negative co-movements in interest rates and stock prices—and central bank information (CBI) shocks—positive co-movements that reflect revised macroeconomic assessments. I examine how each type of shock affects the term structure of survey-based inflation expectations (1–30 years), using a state-dependent local projection framework (Jordà, 2005) that incorporates Shapiro's (2024) decomposition of inflation into supply- and demand-driven components.

Conclusion

These results highlight the critical role of inflation regime dynamics in conditioning the transmission of monetary policy surprises to the term structure of inflation expectations. While conventional (MP) shocks predominantly influence short- and medium-term expectations, central bank information (CBI) shocks exhibit broader and more persistent effects across the entire horizon. Crucially, these responses are state-contingent: supply-driven inflation regimes amplify the response of expectations, whereas demand-driven regimes attenuate them.

Taken together, the findings suggest that the effectiveness of monetary policy—particularly forward guidance—depends not only on the nature of the policy innovation but also on the underlying sources of inflation. Accounting for this interaction is essential for preserving central bank credibility, sustaining well-anchored expectations, and designing policy that remains both effective and optimal across varying macroeconomic states.

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Empirical Analysis

Our baseline econometric specification is the following:

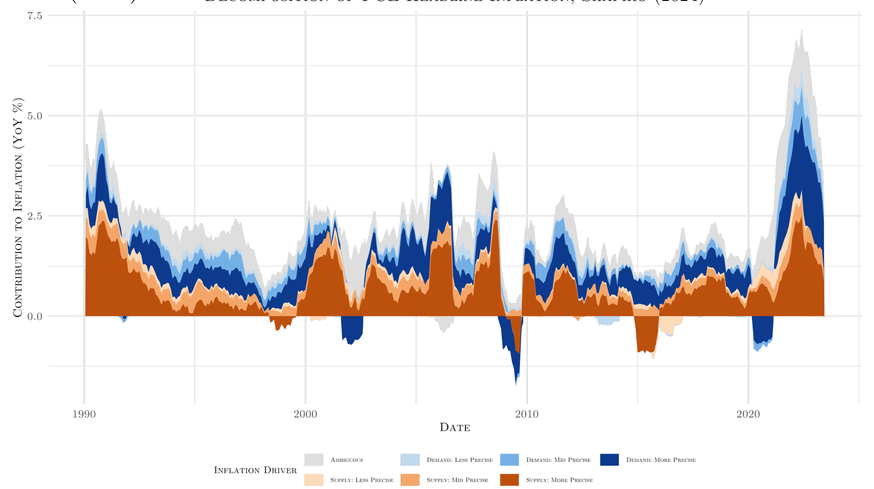
$$\Delta y_{t+h} = \alpha_h + \beta_h \cdot \mathbf{1}\{s_t > 0\} \cdot s_t + \beta_h^s \cdot \mathbf{1}\{s_t > 0\} \cdot s_t \cdot \pi_t^s + \beta_h^d \cdot \mathbf{1}\{s_t > 0\} \cdot s_t \cdot \pi_t^d + \gamma_h \cdot \mathbf{1}\{s_t < 0\} \cdot s_t + \gamma_h^s \cdot \mathbf{1}\{s_t < 0\} \cdot s_t \cdot \pi_t^s + \gamma_h^d \cdot \mathbf{1}\{s_t < 0\} \cdot s_t \cdot \pi_t^d + \mathbf{A}_h \sum_{\tau=1}^{L} \mathbf{C}_{t-\tau} + \varepsilon_{t+h}$$

for $h = 1,2,\ldots,12$. The dependent variable y_{t+h} is the change in inflation expectations from *t-1* to *t+h*. The shock variable $s_t \in \{MP_t, CBI_t\}$ denotes either a monetary policy or information surprise. Coefficients, β_h ${\beta^s}_h$, ${\beta^d}_h$ and γ_h, ${\gamma^s}_h$, ${\gamma^d}_h$ capture the responses to positive and negative shocks, interacted with the supply- and demand-driven components of PCE inflation ${\pi^s}_t$, ${\pi^d}_t$ Controls $\mathbf{C_t}$ include six lags of macroeconomic indicators.

Data

The empirical analysis draws on three main inputs: the term structure of inflation expectations, exogenous monetary policy shocks, and a structural decomposition of inflation into supply- and demand-driven components. The dataset spans monthly U.S. data from February 1990 to June 2023. Inflation expectations are obtained from the Federal Reserve Bank of Cleveland's model-based estimates. Monetary policy surprises are taken from Jarociński and Karadi (2020). Inflation regimes are classified using Shapiro's (2022) high-precision decomposition of PCE inflation, which assigns each sector as supply- or demand-driven based on the sign pattern of residuals in price and quantity regressions. The baseline specification includes six lags of these inflation regime variables and standard macro controls: log industrial production, the unemployment rate, the NFCI, the S&P 500 index, and the Wu-Xia (2016) shadow federal funds rate. Results are robust to alternative monetary policy shock series from Bauer and Swanson (2023) and Miranda-Agrippino and Ricco (2021).

Decomposition of PCE Headline Inflation, Shapiro (2024)



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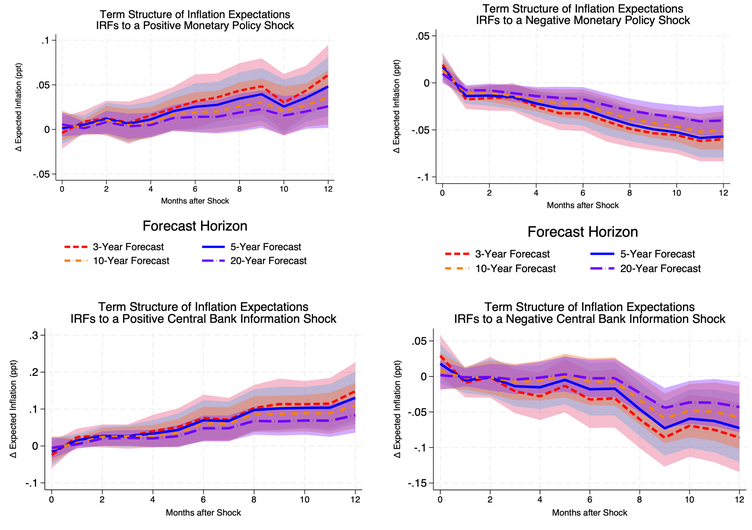
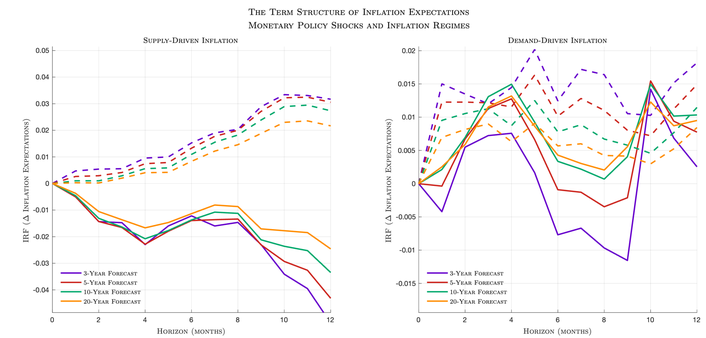
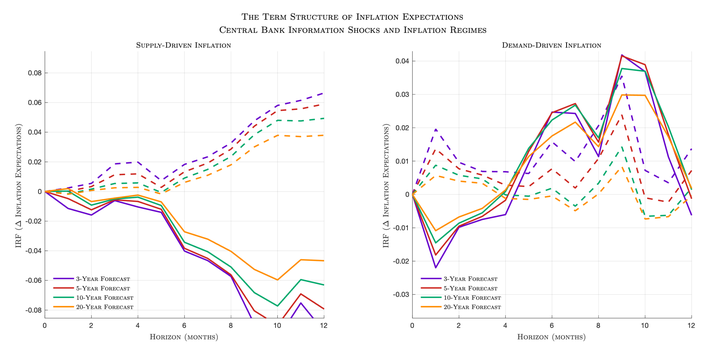
Results



90% Confidence Bands, Newey-West Standard Errors





For references and to read the working paper please visit tylersotomayor.com/research

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