Session 2: Inflation Dynamics and Inflation Expectations

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RESEARCH CONFERENCE

INFLATION, EXPECTATIONS AND MONETARY POLICY: WHAT HAVE WE LEARNED AND TO WHAT END?

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INFLATION, EXPECTATIONS AND MONETARY POLICY

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Jerome Powell, April 4th, 2025 & May 7, 2025.

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- a global pandemic
- an inflation surge and near-costless subsequent disinflation
- Russian invasion of Ukraine and active fighting in the Middle East
- growing prevalence of trade wars
- coming realignment of the international economic order

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What has this chaos taught us about inflation, inflation expectations and monetary policy?

MAIN LESSONS

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  - When inflation is low, people are (optimally?) inattentive to inflation and monetary policy and reliant on readily observable price signals → *unanchored expectations*
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- Implications:
  - The specific framework (IT vs AIT vs FAIT vs PLT) is unlikely to change this outcome.
  - Policy should focus on bringing inflation to the target as quickly as possible and only then focus on communication to anchor expectations when the setting is right.

WHOSE AND WHICH EXPECTATIONS WE SHOULD CARE ABOUT

	Inflation expectations	
	Short run	Long run
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For the majority of economic decisions, it is short-run inflation expectations that matter.

ARE EXPECTATIONS ANCHORED?

Five metrics:

- Inflation expectations are close to the target.
- There is little disagreement in expectations.
- Revisions in inflation expectations are small.
- Firms/households show confidence in their forecasts.
- Short- and long-term inflation expectations are uncorrelated.

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These patterns hold pre-surge and during/after the surge as well.

ANCHORED EXPECTATIONS? THE "EYEBALL" TEST

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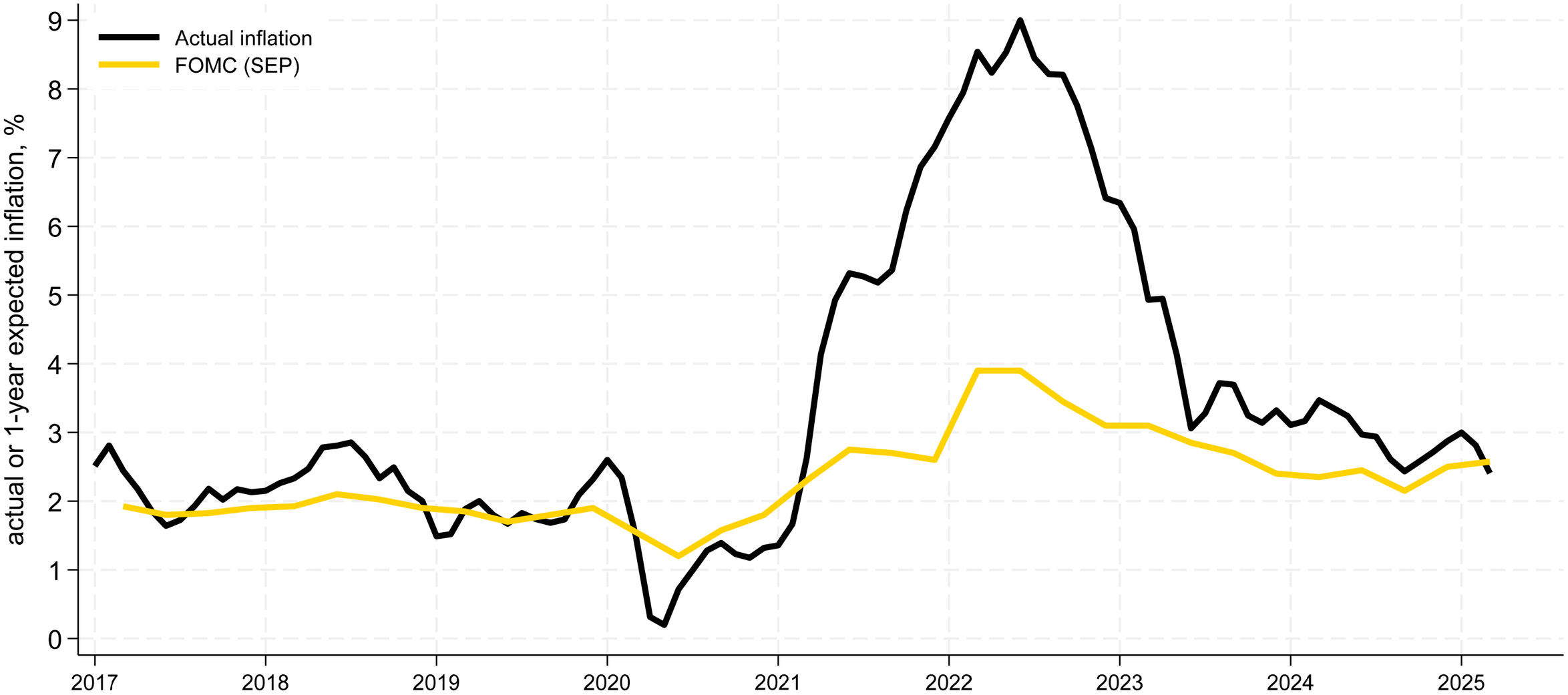

FOMC/SEP is the gold standard of anchored inflation expectations.

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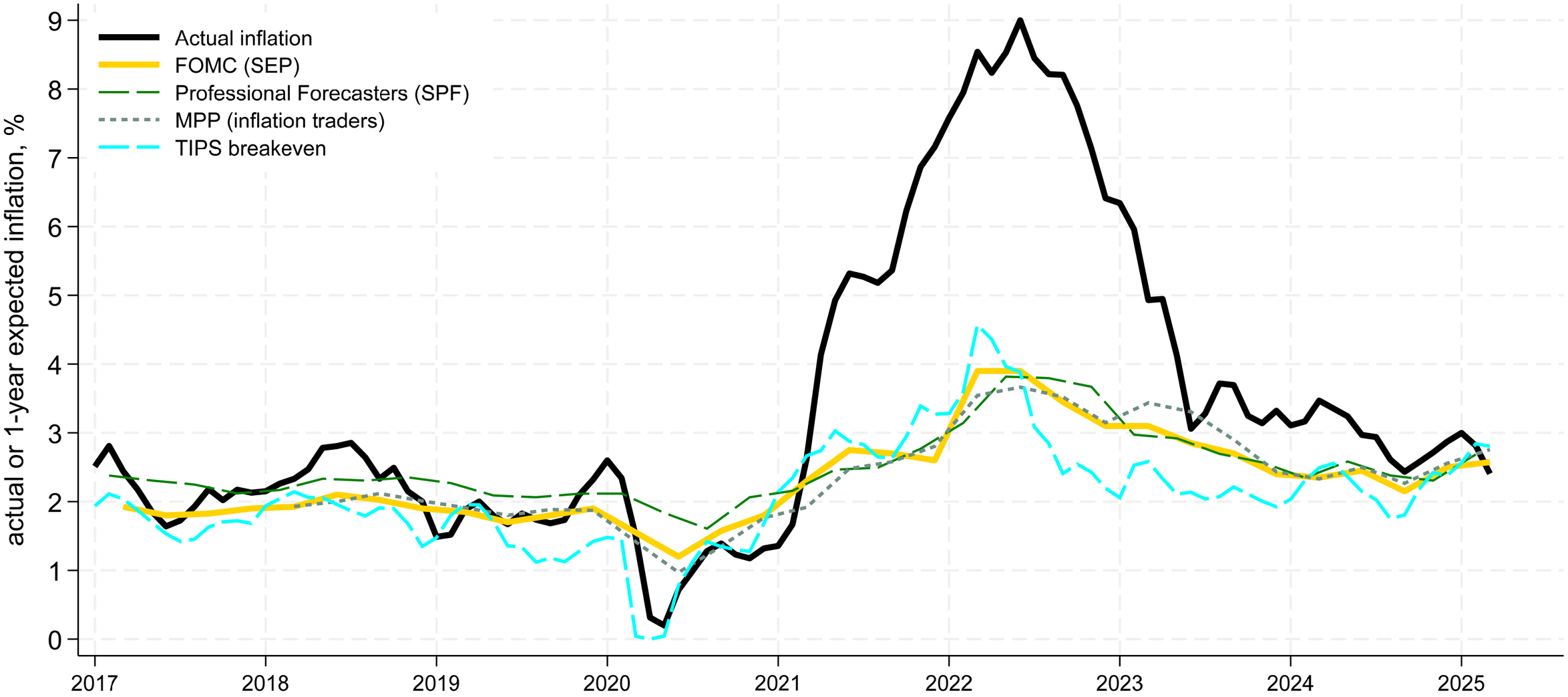

The short-run expectations of markets and professionals are very similar to FOMC forecasts.

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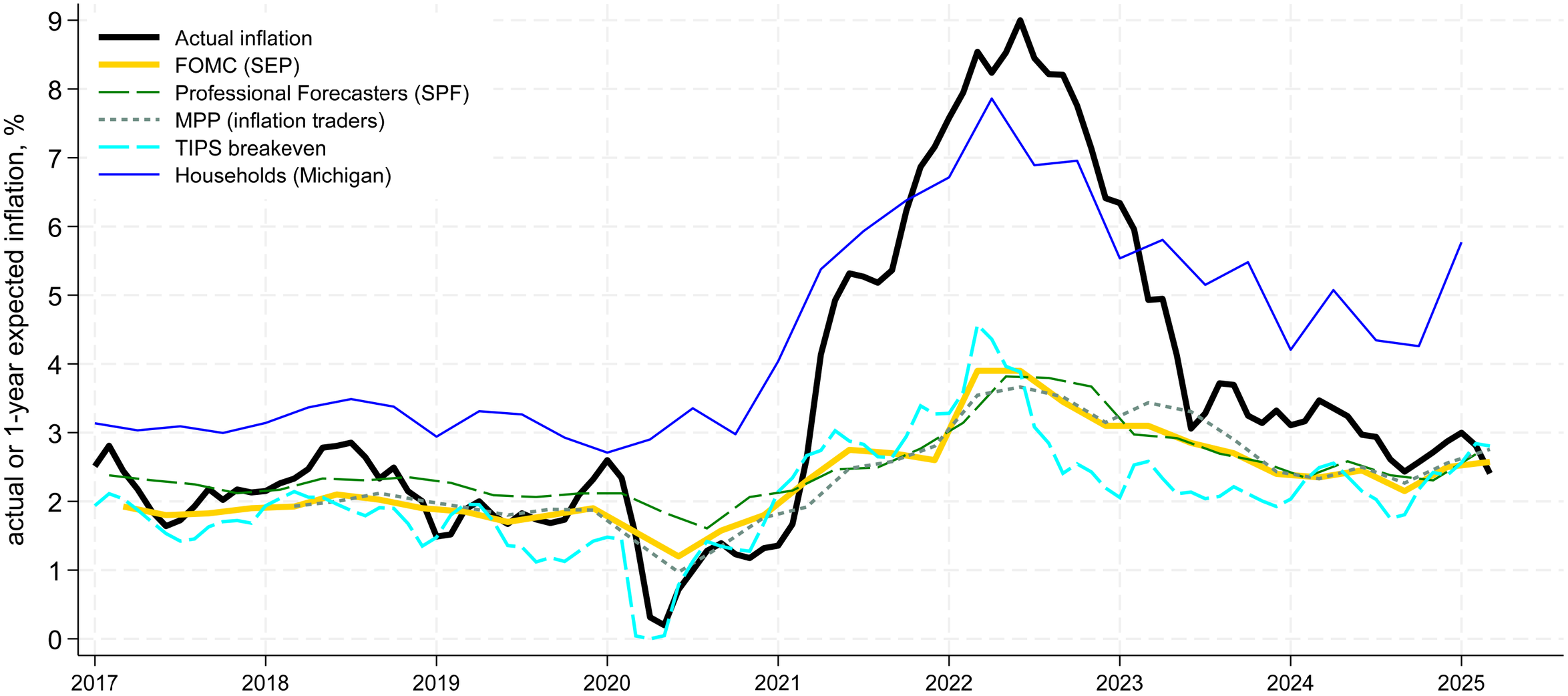

Households' expectations: one should use mean (rather than median) expectations. These indicate very high levels of inflation expectations since the surge, **across all surveys**.

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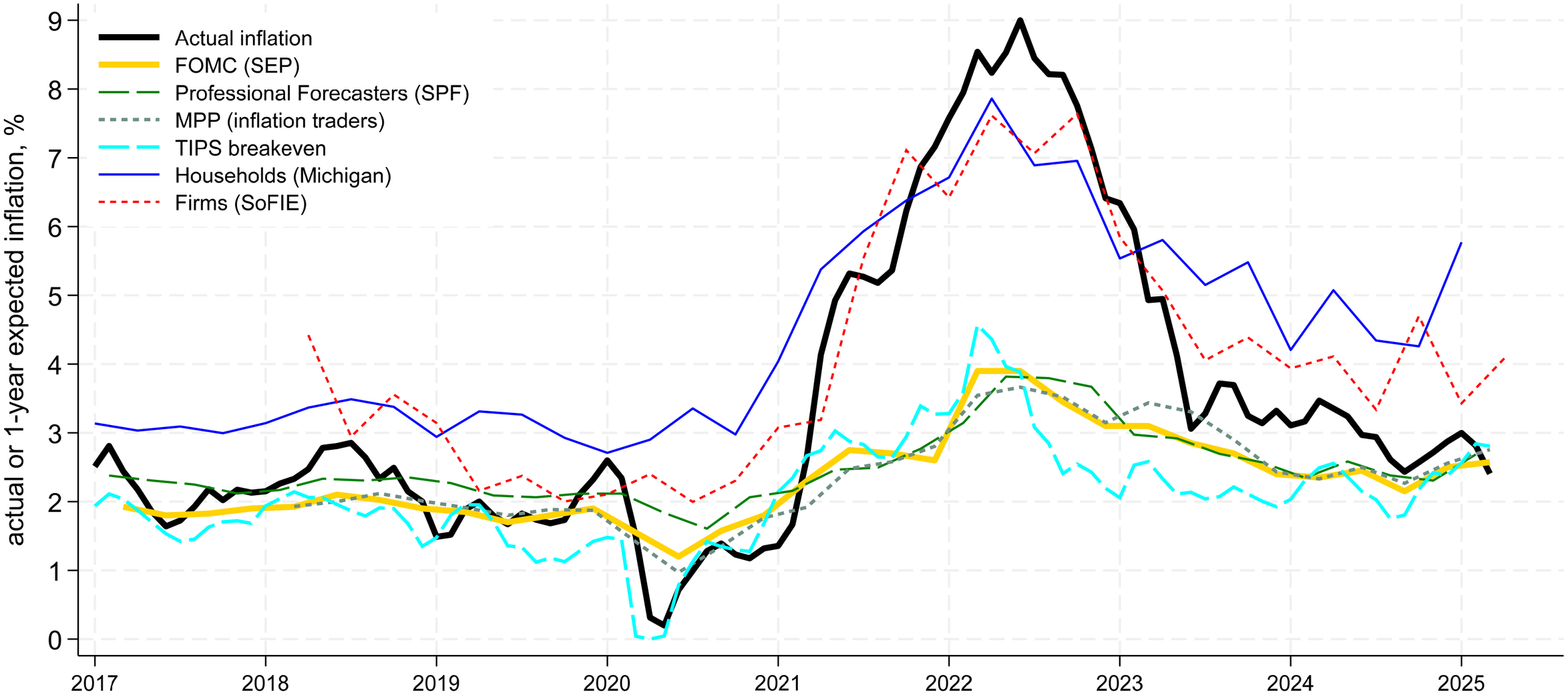
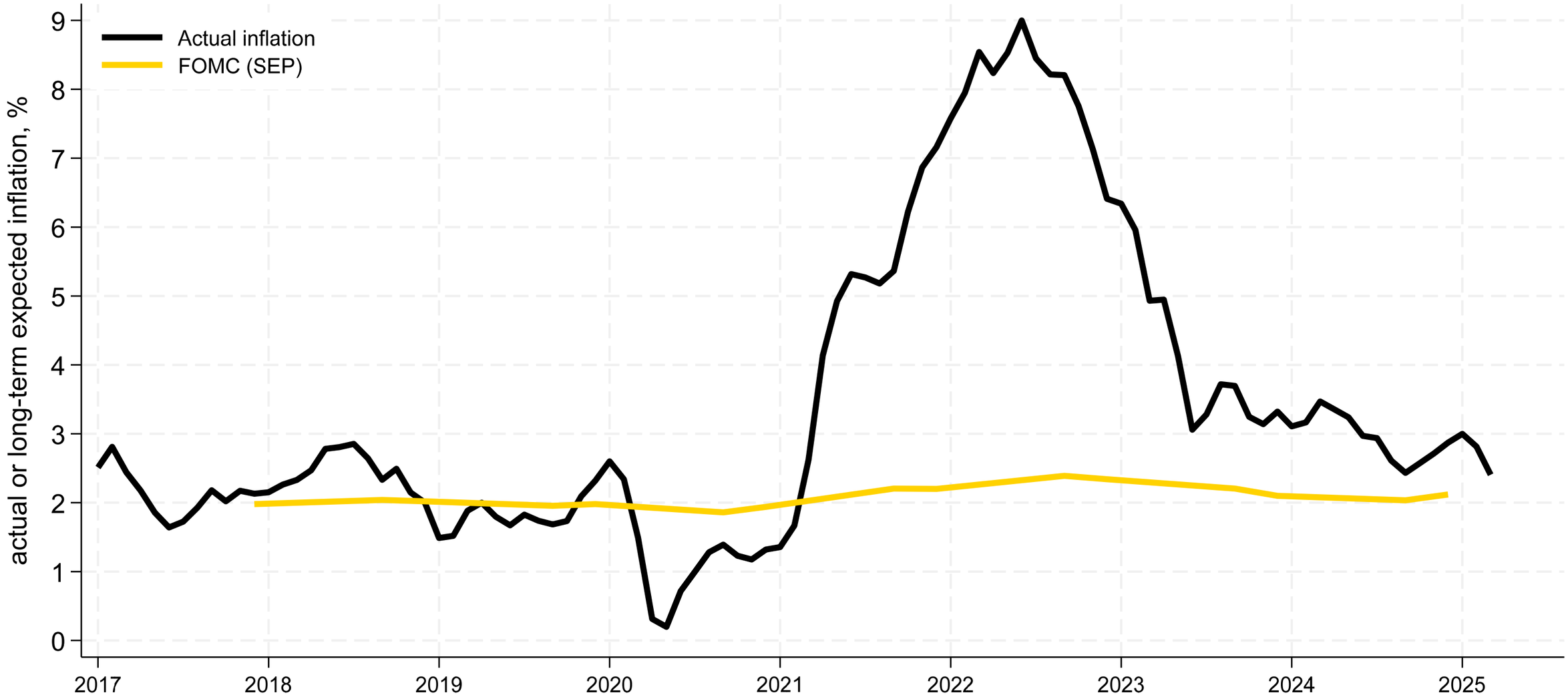


Firms are similar to households: Short-run inflation expectations after the surge are significantly higher than prior to the surge.

ANCHORED LONG-RUN EXPECTATIONS? THE "EYEBALL" TEST



Long-run expectations: anchored SEP

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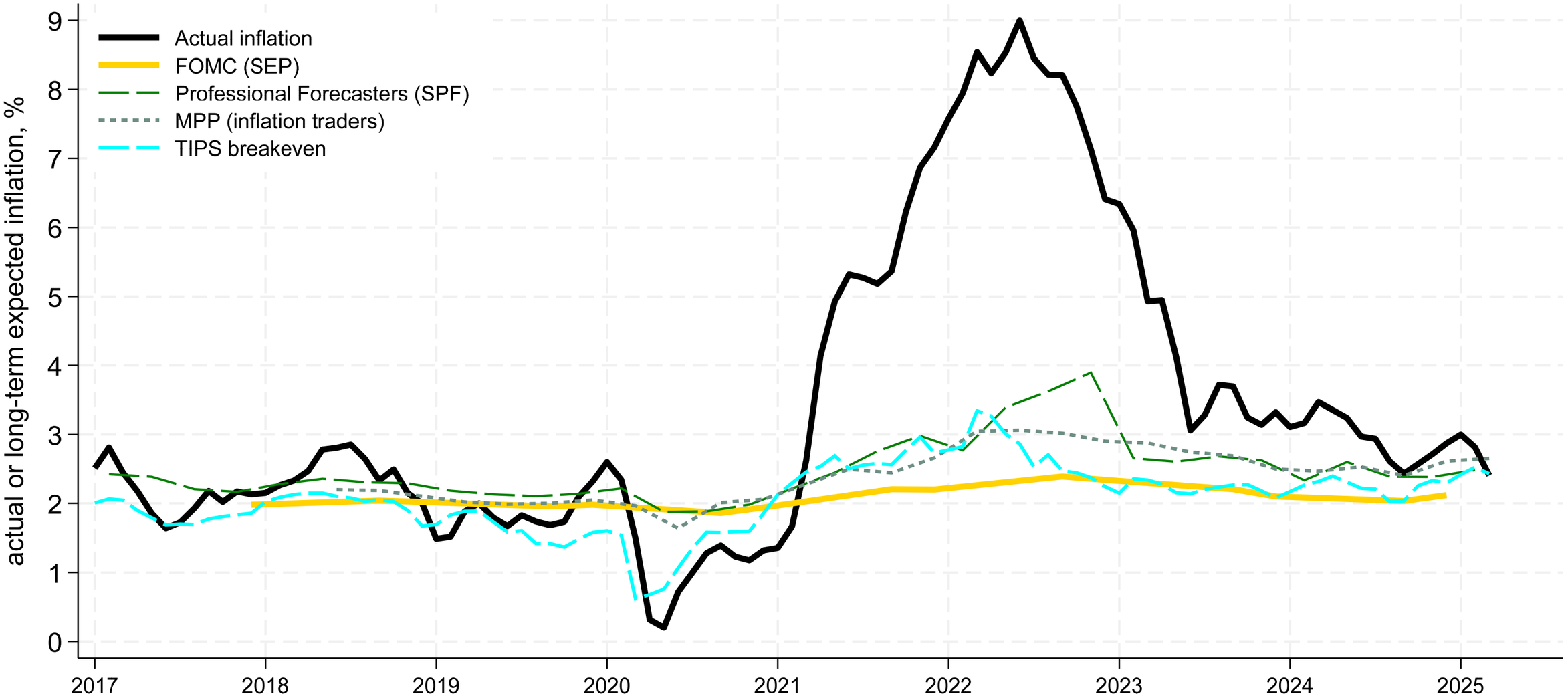

Long-run expectations: SPF/MPP/TIPS display more pronounced deviations from SEP.

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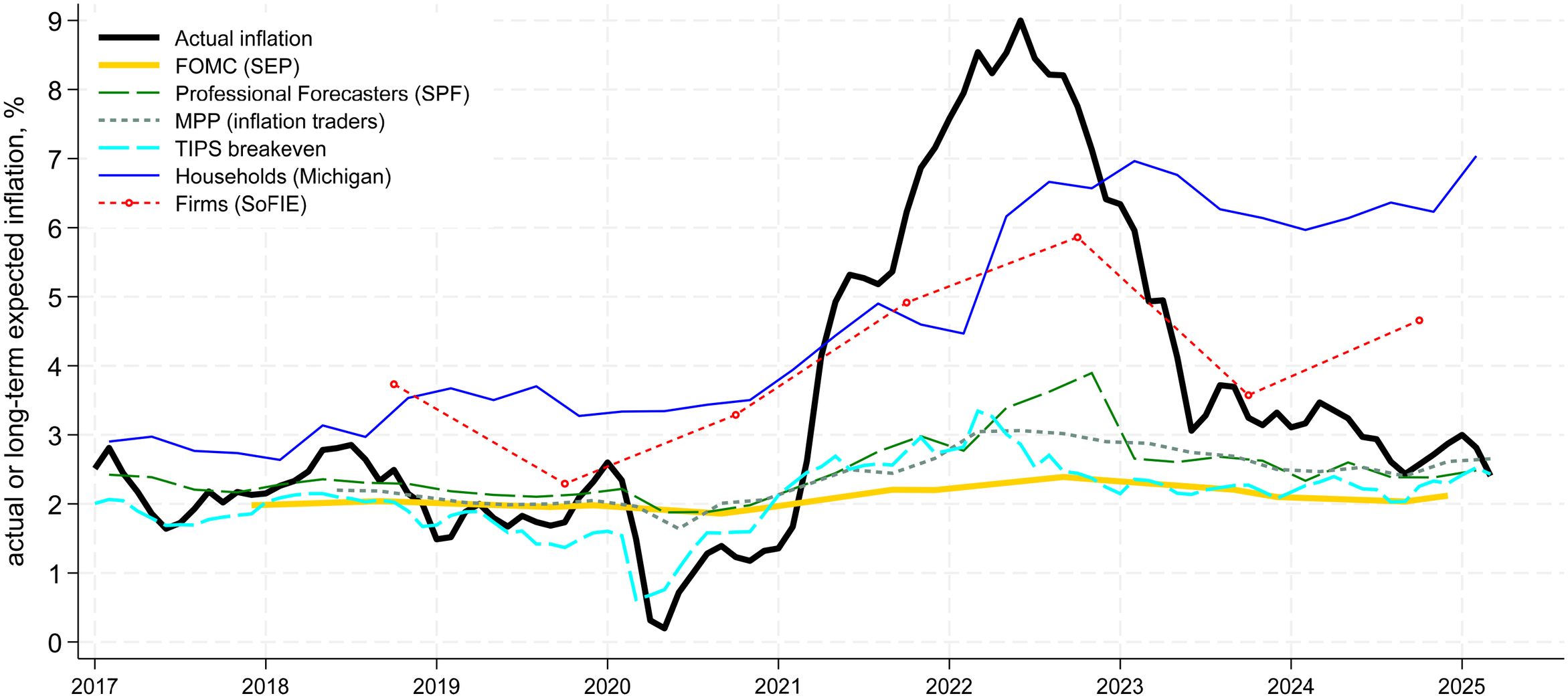
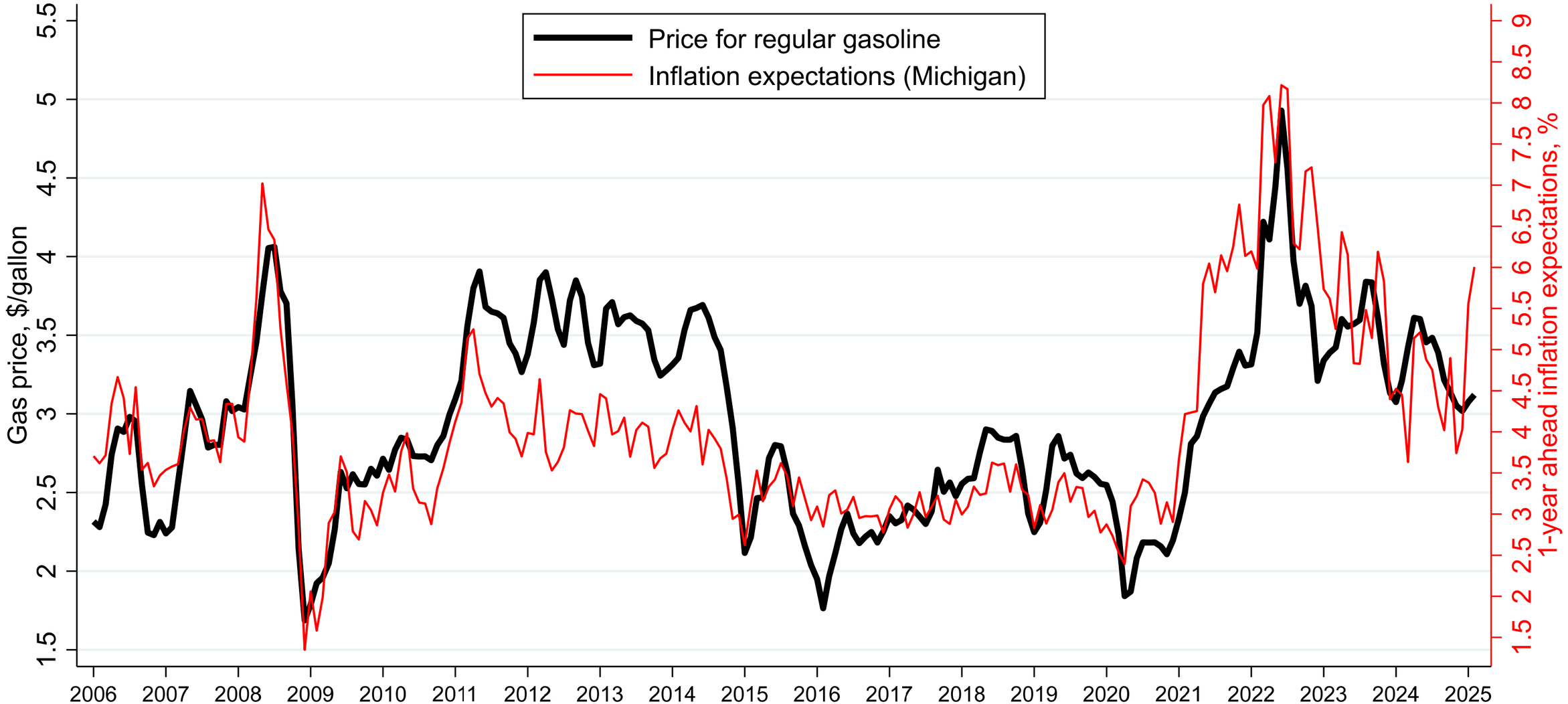


Long-run expectations: Firms/Households' expectations appear *increasingly* unanchored.

EXPECTATIONS: NOISE OR NOT?



The high-frequency variation in mean forecasts is *not* noise. People respond to incoming information

"BERNANKE" TEST OF ANCHORED EXPECTATIONS

"In this context, I use the term "anchored" to mean relatively insensitive to incoming data. So, for example, if the public experiences a spell of inflation higher than their long-run expectation, but their long-run expectation of inflation changes little as a result, then inflation expectations are well anchored. *If, on the other hand, the public reacts to a short period of higher-than-expected inflation by marking up their long-run expectation considerably, then expectations are poorly anchored.*"

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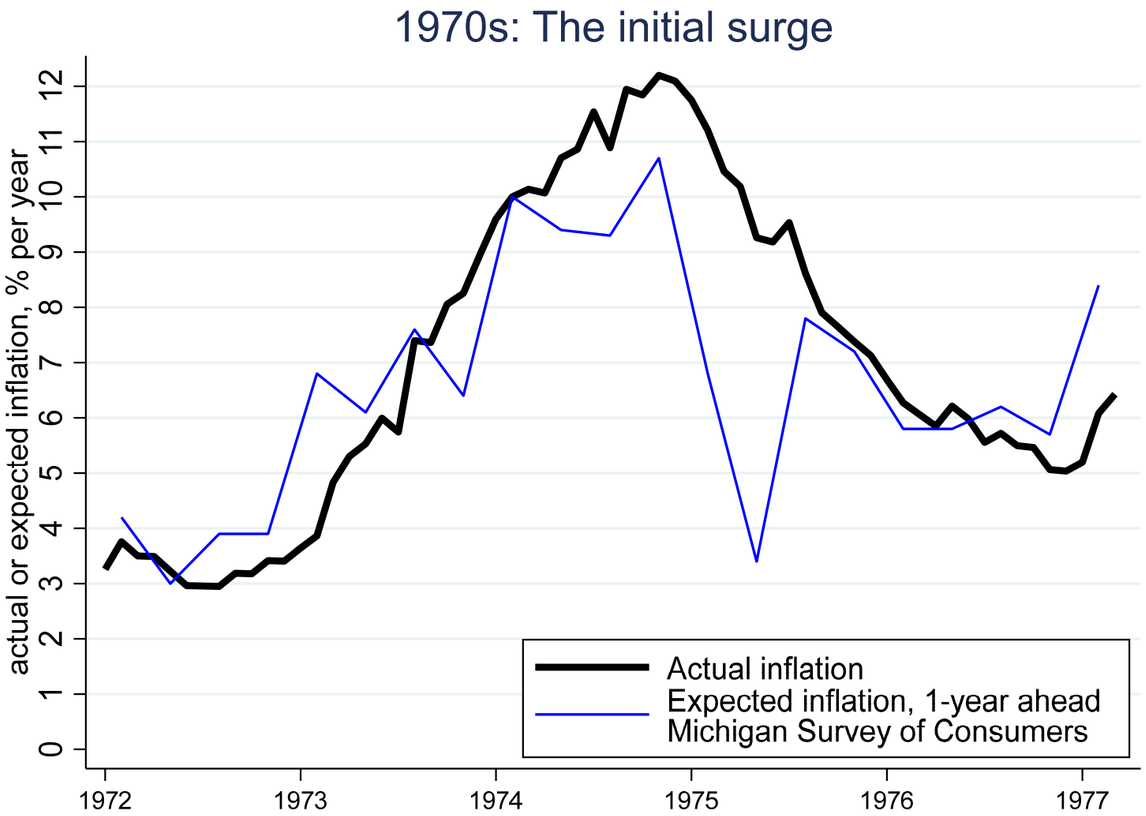
Result: A 10bp surprise increase in rates lowers 5-10yr inflation forward by 4bp; see Nakamura and Steinsson (2018), Acosta et al. (2025).

INFLATION AND INFLATION EXPECTATIONS: NOW AND THEN



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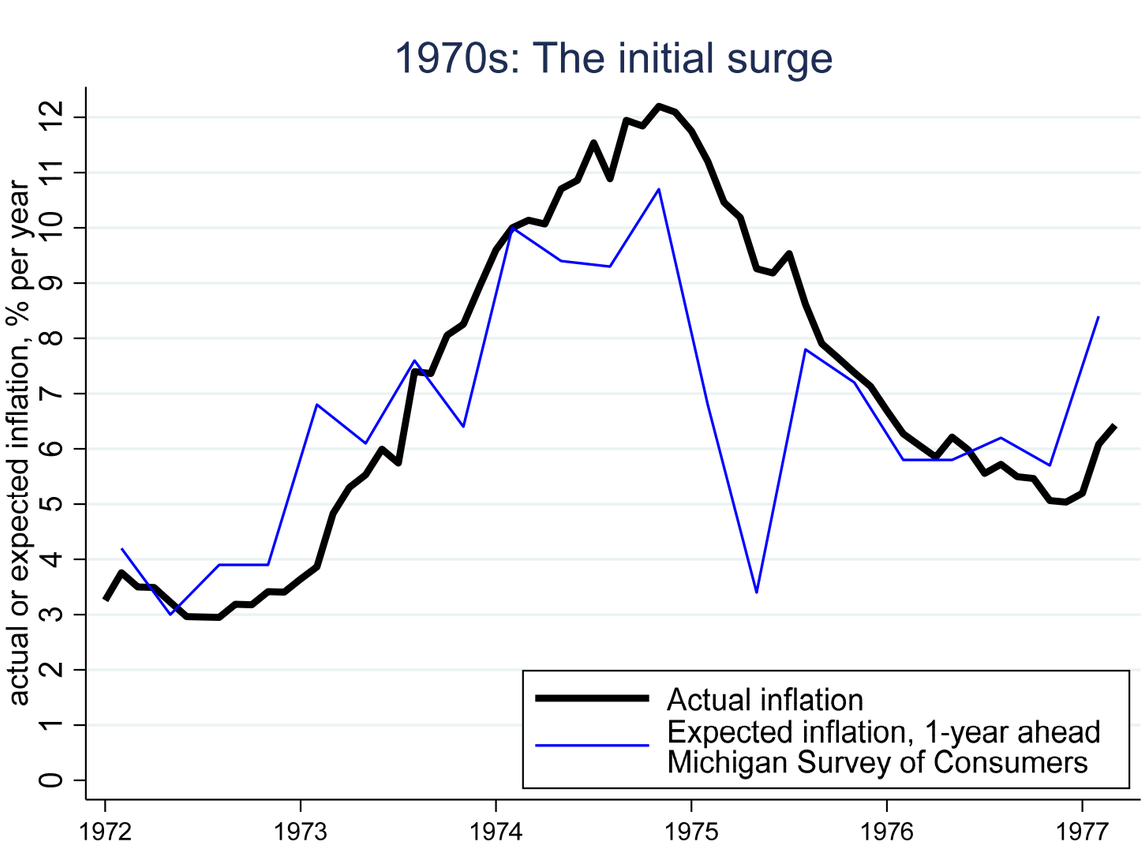

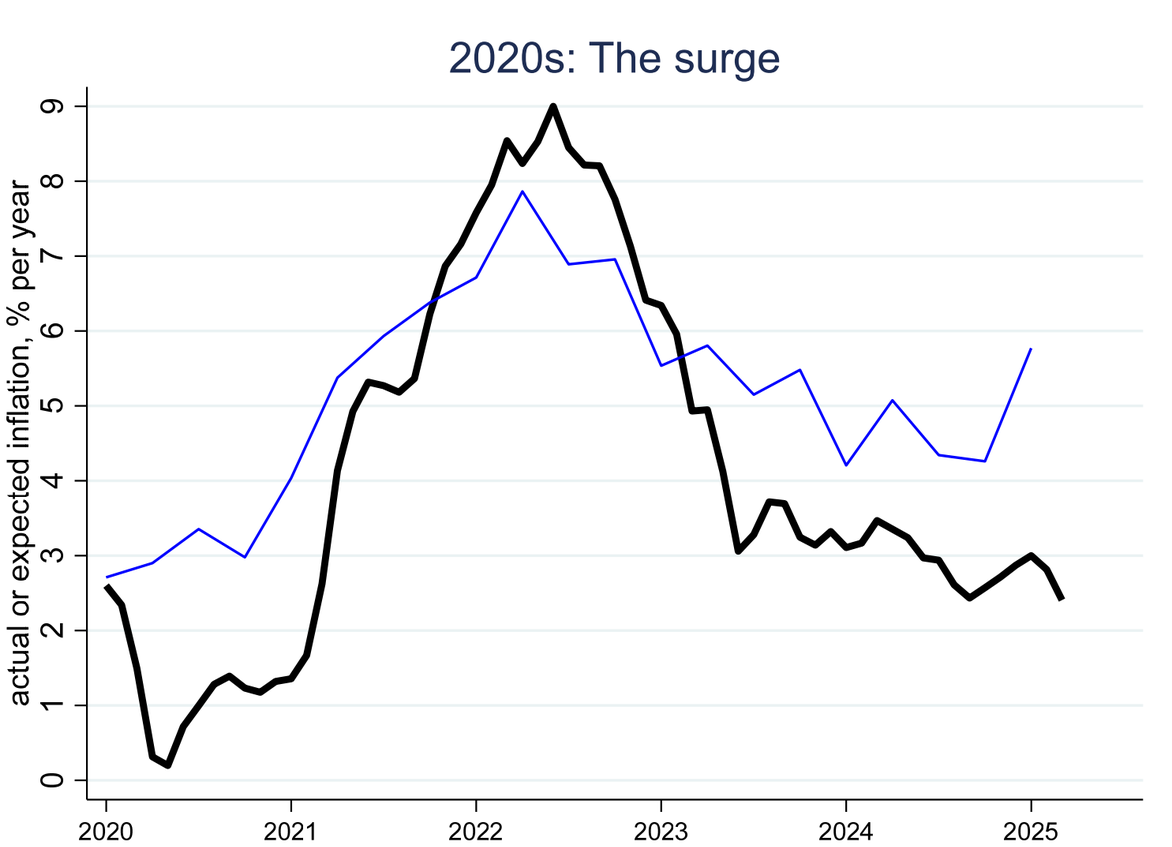

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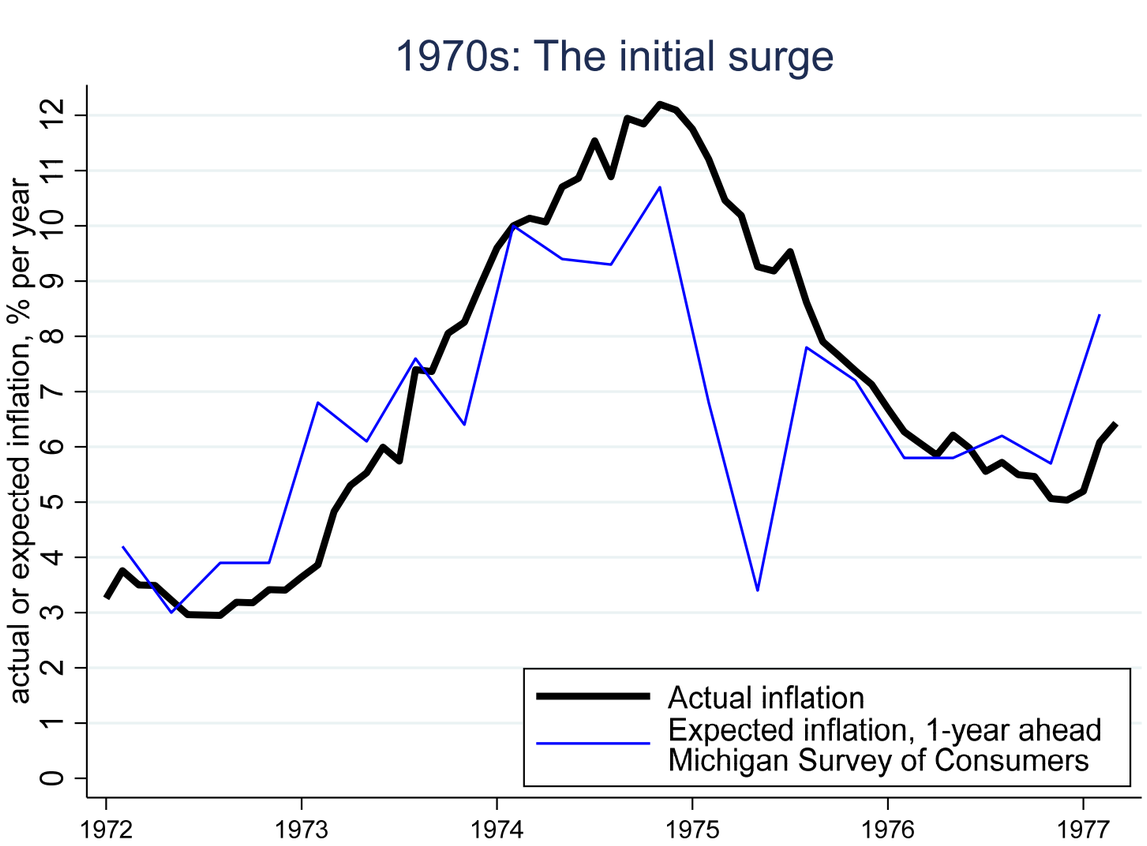

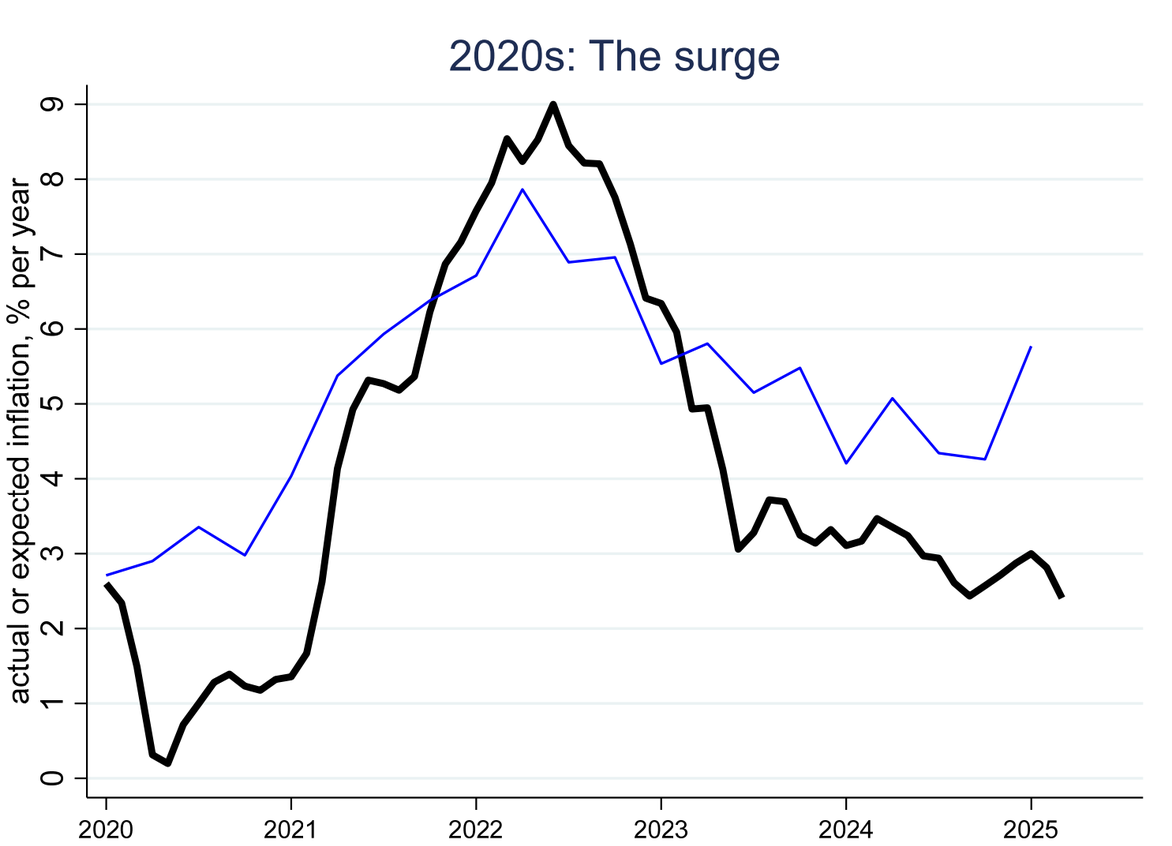

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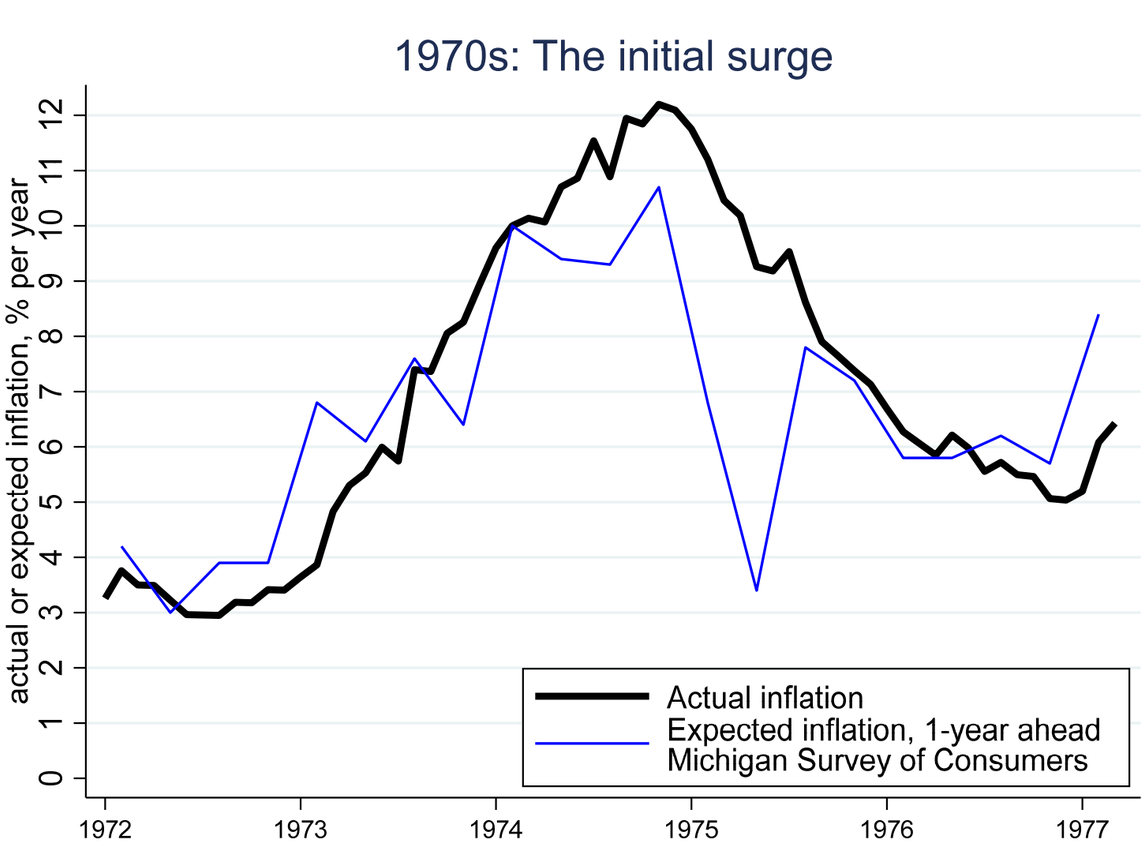

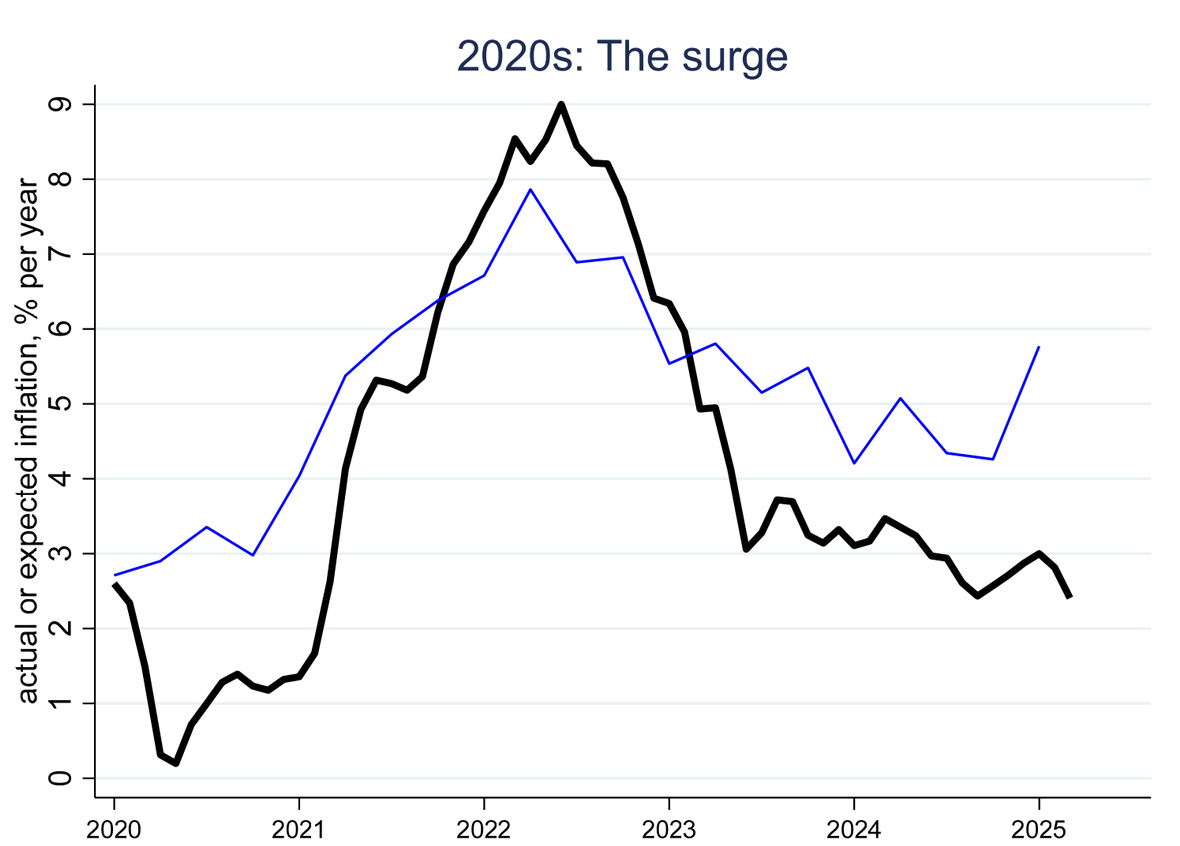

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- How can one look at the current situation and view it as a success of anchored expectations?
- If there is a cost-push spark similar to the 1978 Iranian revolution ($\Longrightarrow$ second surge of inflation in the 1970s), we may expect the same outcome.

ARE INFLATION EXPECTATIONS ANCHORED?

Forecaster	Eyeball test for long-run expectations	Bernanke Test passthrough into long-run expectations
FOMC forecasts	Yes	N/A
Professional forecasters	Sometimes	No
Financial markets	Sometimes	No
Firms	No	No
Households	No	Sometimes/no

Inflation expectations were and remain unanchored.

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But we are not born with unanchored inflation expectations! People respond to changes in incentives and environment.

CHANGING INATTENTION DURING THE SURGE

- Randomized controlled trials: provide subsets of firms or households with various bits of information and see how they update beliefs about inflation

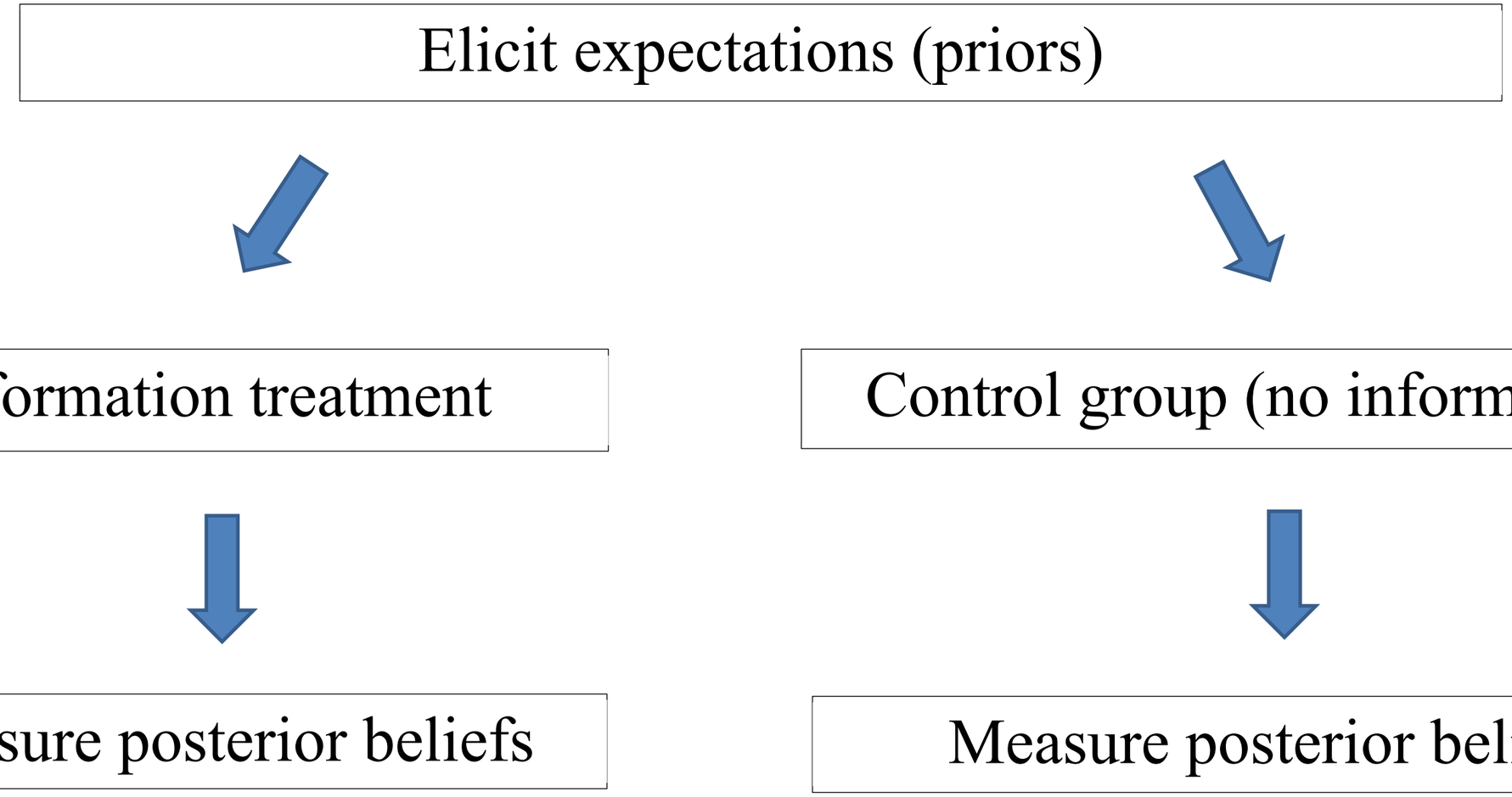
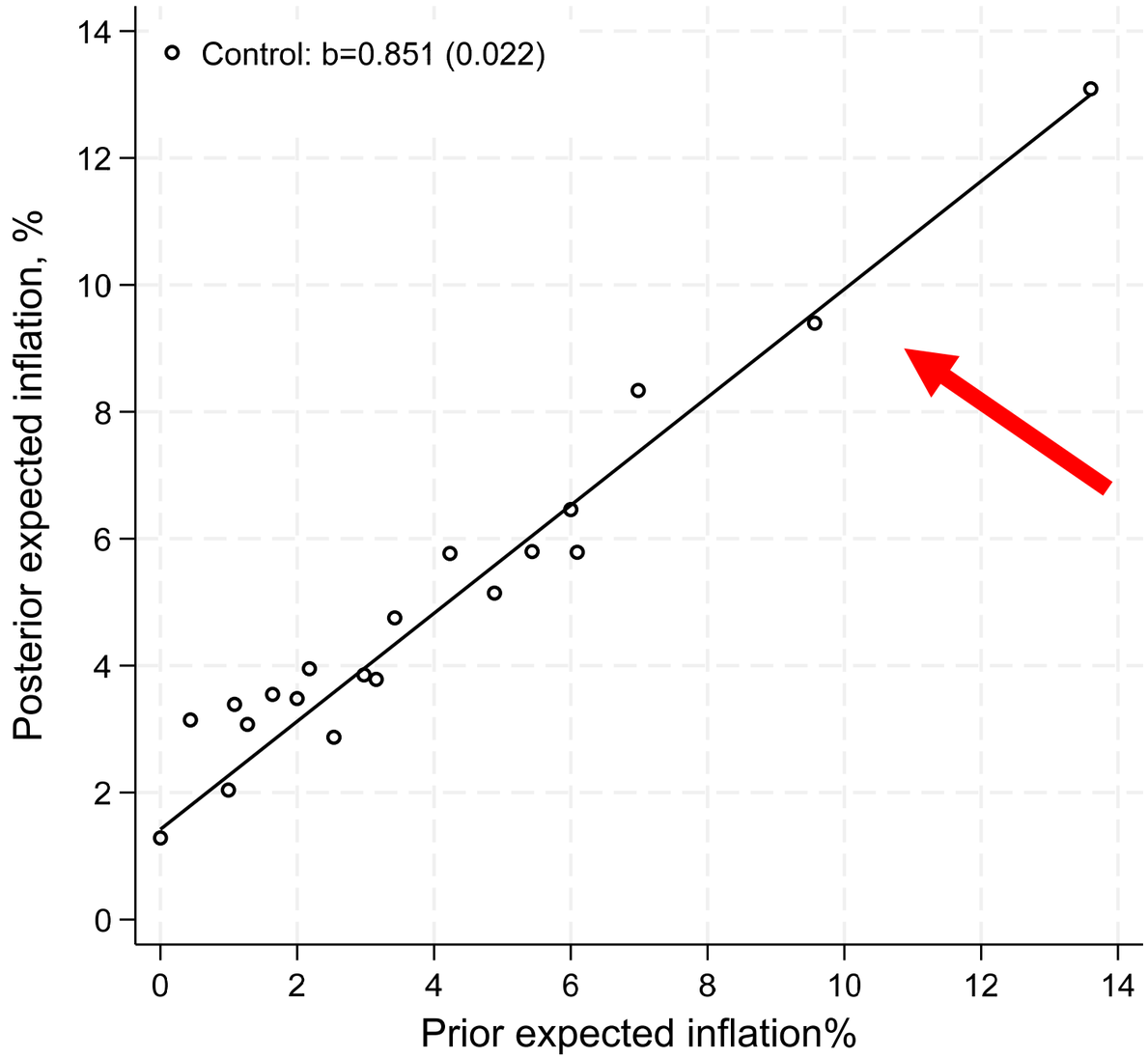


ILLUSTRATION: NIELSEN RCT 2018Q2



Slope for control group

For control group that gets no information, posterior expectations are the same as prior expectations on average.

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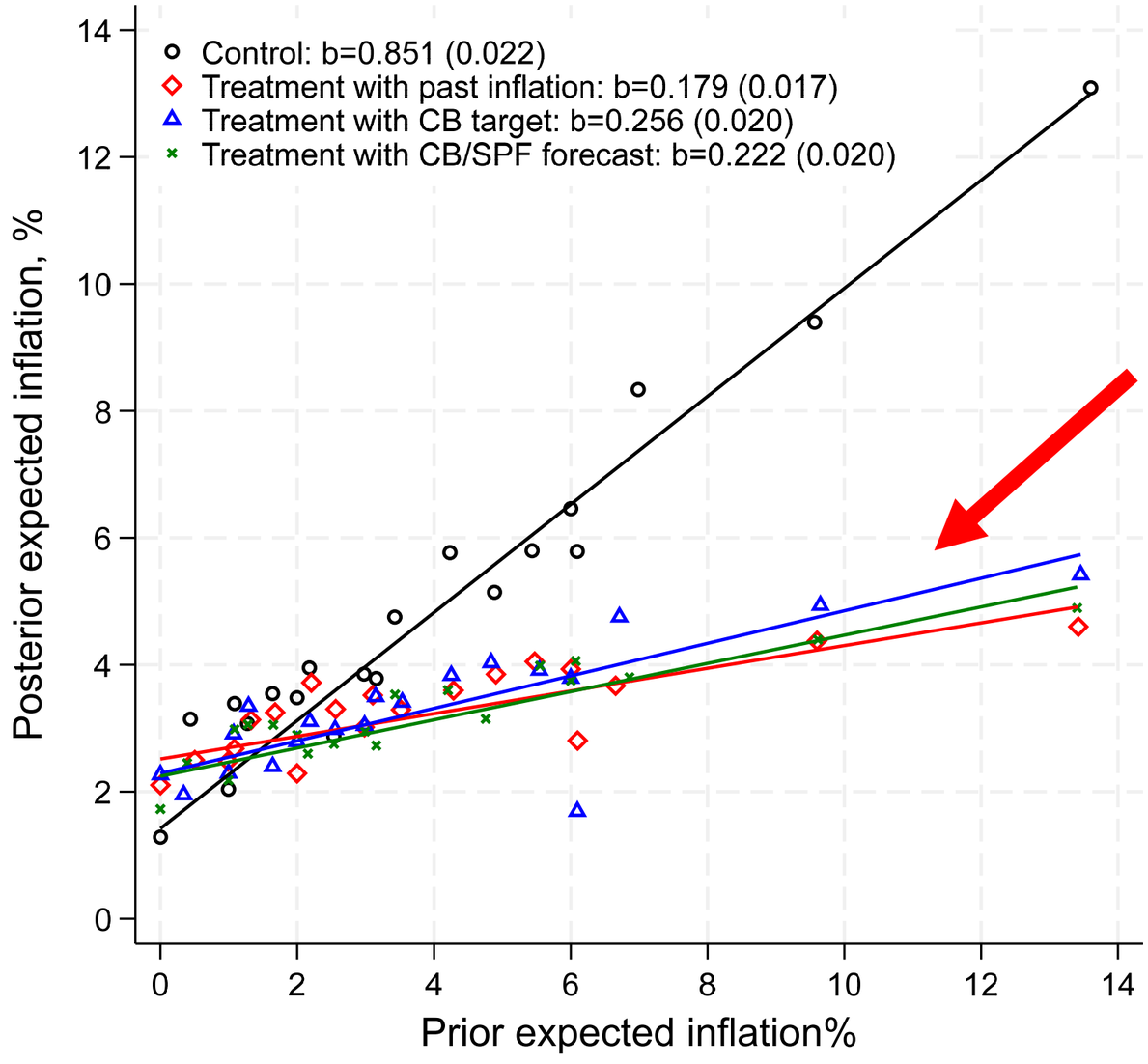
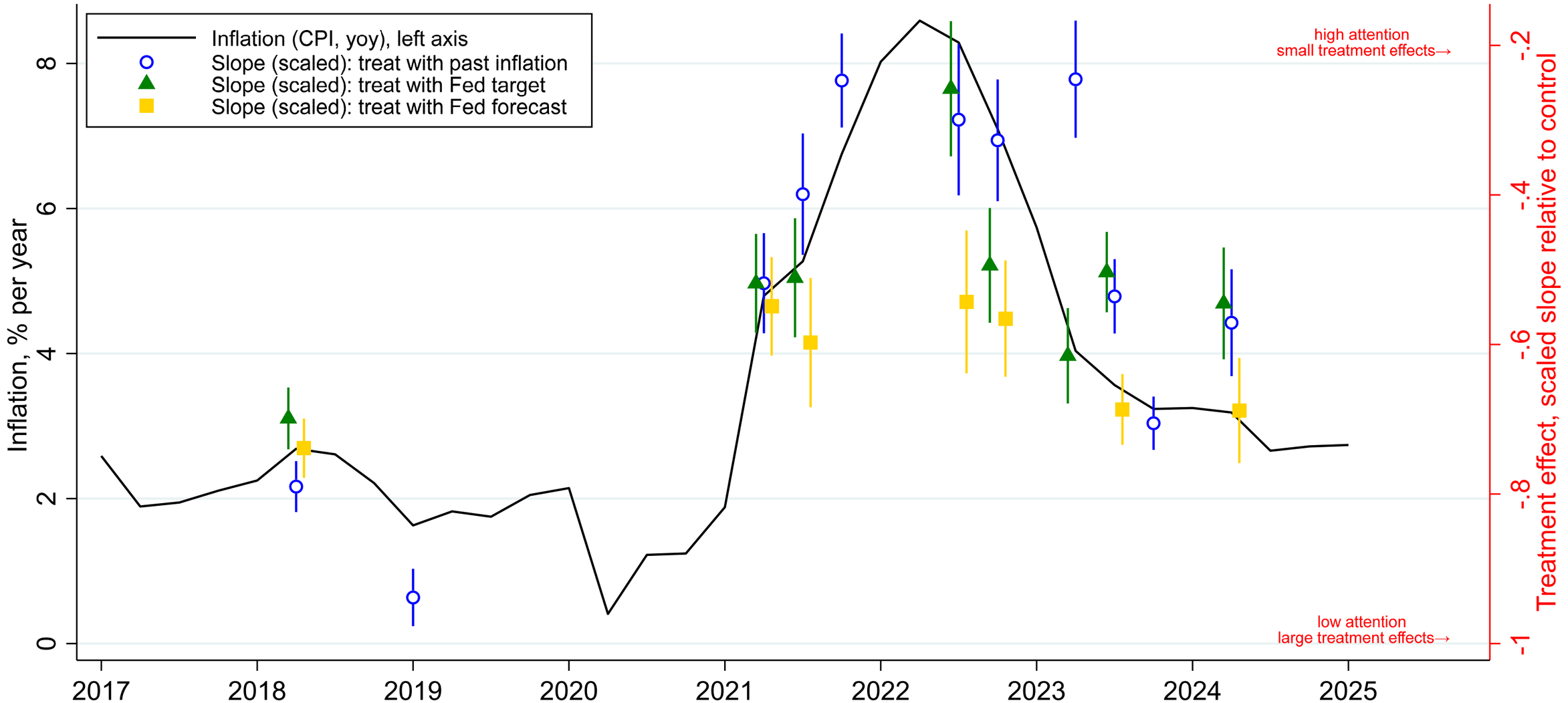


Receive information about inflation or the target

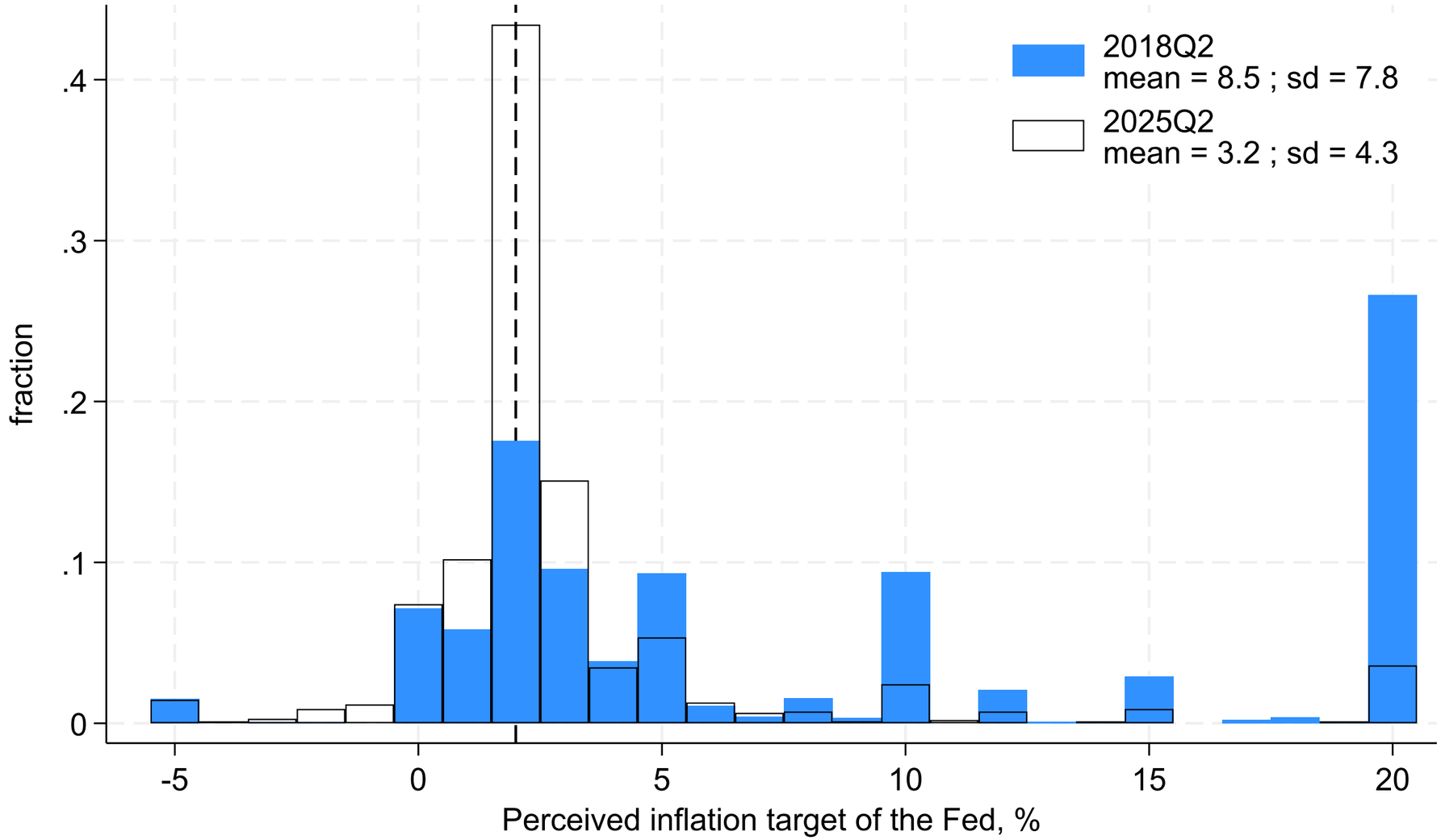
When people are told information about inflation, their posteriors move toward the signal. *Flat slope indicates people were very inattentive in 2018.*

CHANGING INATTENTION IN THE US



As inflation surged, people became more attentive to inflation! Inattention has since risen but remains lower than before (scarring effects?).

KNOWLEDGE OF MONETARY POLICY



People knew little about the Fed's policy framework and mandate prior to the surge

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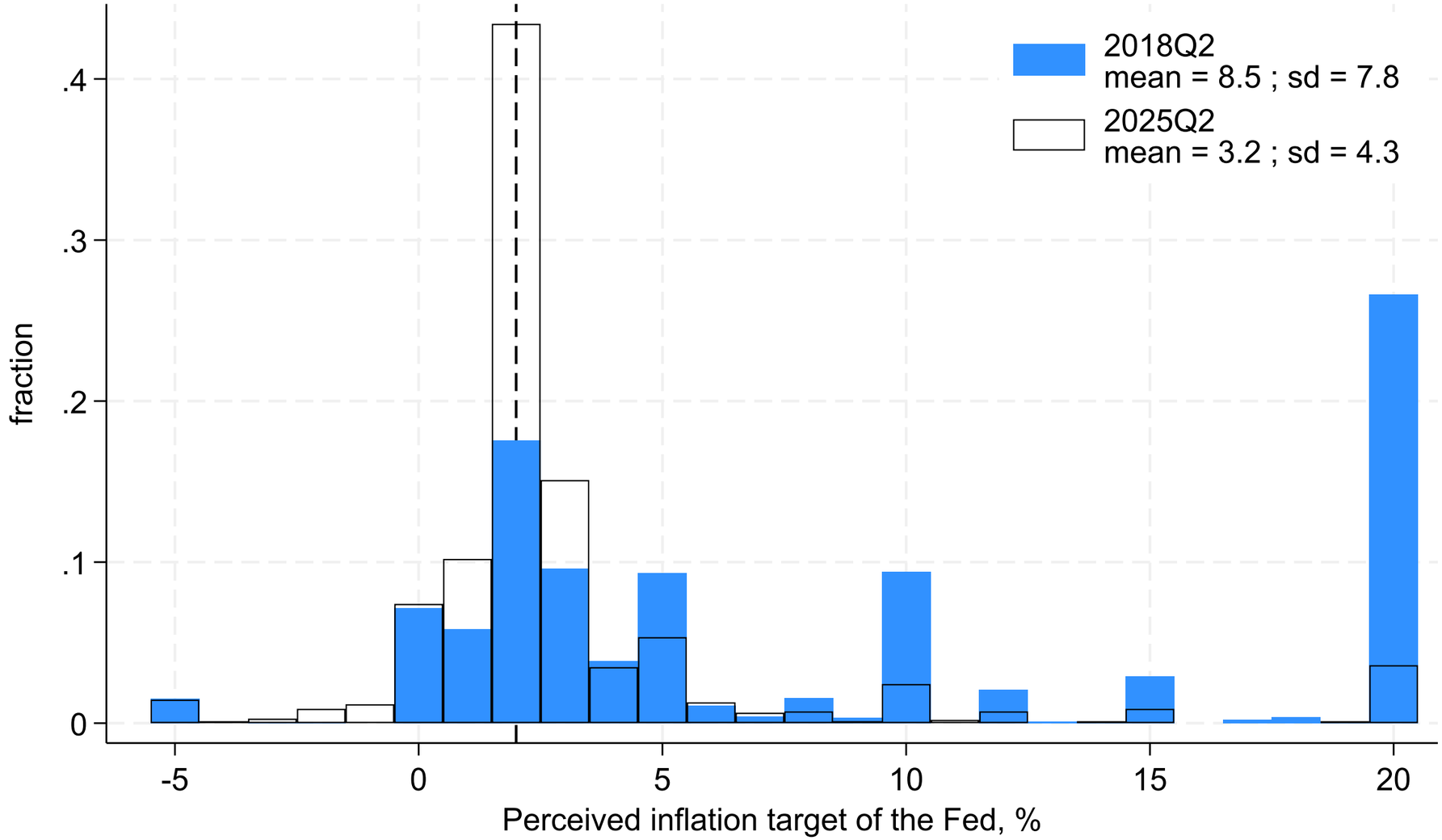

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This is a costly lesson (people are willing to sacrifice 5% of their consumption to have price stability)

THE CYCLE OF SELECTIVE INATTENTION

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- When inflation is high: the public becomes attentive and learns that *inflation is much higher than the target and the central bank is failing*! Expectations become *more unanchored*. At that time, reaching the public is easy but changing their opinions is difficult since they are more informed.

IF INFLATION EXPECTATIONS ARE UNANCHORED, THEN WHAT?

INFLATION AND INFLATION EXPECTATIONS

Most macroeconomic models linking nominal and real sides of the economy rely on some kind of expectations-augmented Phillips curve, e.g. the New Keynesian Phillips curve:

$$\pi_t \approx \underbrace{\pi^e_{t+1}}_{\substack{expected \\ inflation}} - \alpha \underbrace{(U_t - U_t^*)}_{\substack{unemployment \\ gap}} + \underbrace{\varepsilon_t}_{\substack{cost-push \\ shocks}}$$

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Two characteristics common across the models:

- It is the expectations of firms that matter most directly from price-setting decision.
- It is short-run expectations that matter most directly.

WHOSE EXPECTATIONS MATTER IN THE PHILLIPS CURVE?

	Dependent variable: CPI inflation π_t		
	(1)	(2)	(3)
MSC: $E^{1yr}\pi$	1.504***		1.264***
	(0.088)		(0.238)
SPF: $E^{1yr}\pi$		0.958***	0.279*
		(0.133)	(0.169)
Unemployment gap, $U - U^*$	-0.193**	-0.231**	-0.207**
	(0.079)	(0.105)	(0.081)
Sample	1978-2025	1981-2025	1981-2025
Observations	189	175	175
R-squared	0.716	0.268	0.485

As prior to the surge, household expectations are best proxy.

WHAT HORIZON OF EXPECTATIONS MATTERS IN THE PHILLIPS CURVE?

	Dependent variable: CPI inflation π_t		
	(1)	(2)	(3)
$E^{1yr}\pi$	1.425***	1.476***	
	(0.187)	(0.135)	
$E^{5yr}\pi$	0.077		1.067***
	(0.162)		(0.221)
Unemployment gap, $U - U^*$	-0.202**	-0.197**	-0.315***
	(0.085)	(0.086)	(0.119)
Observations	161	161	161
R-squared	0.588	0.587	0.304

As prior to the surge, it is short-run expectations that fit the Phillips curve best.

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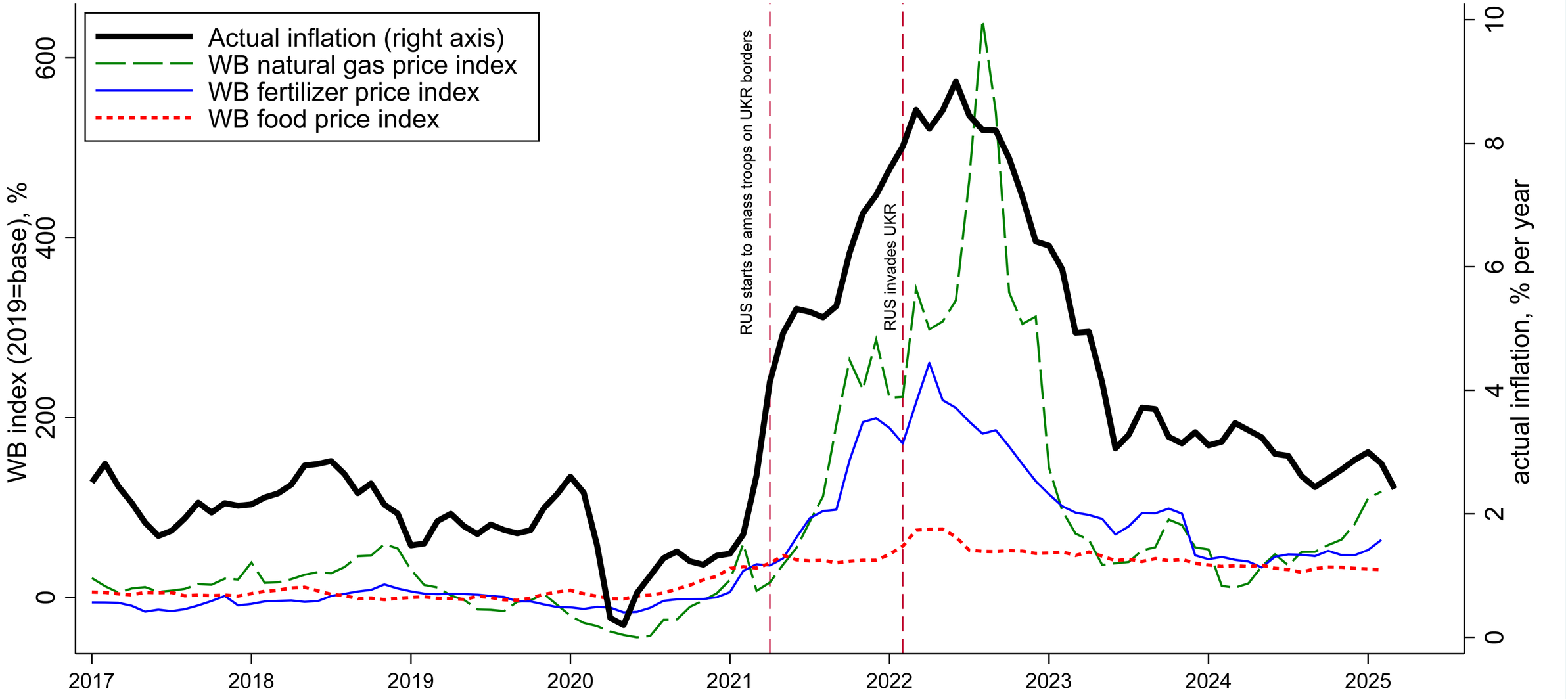
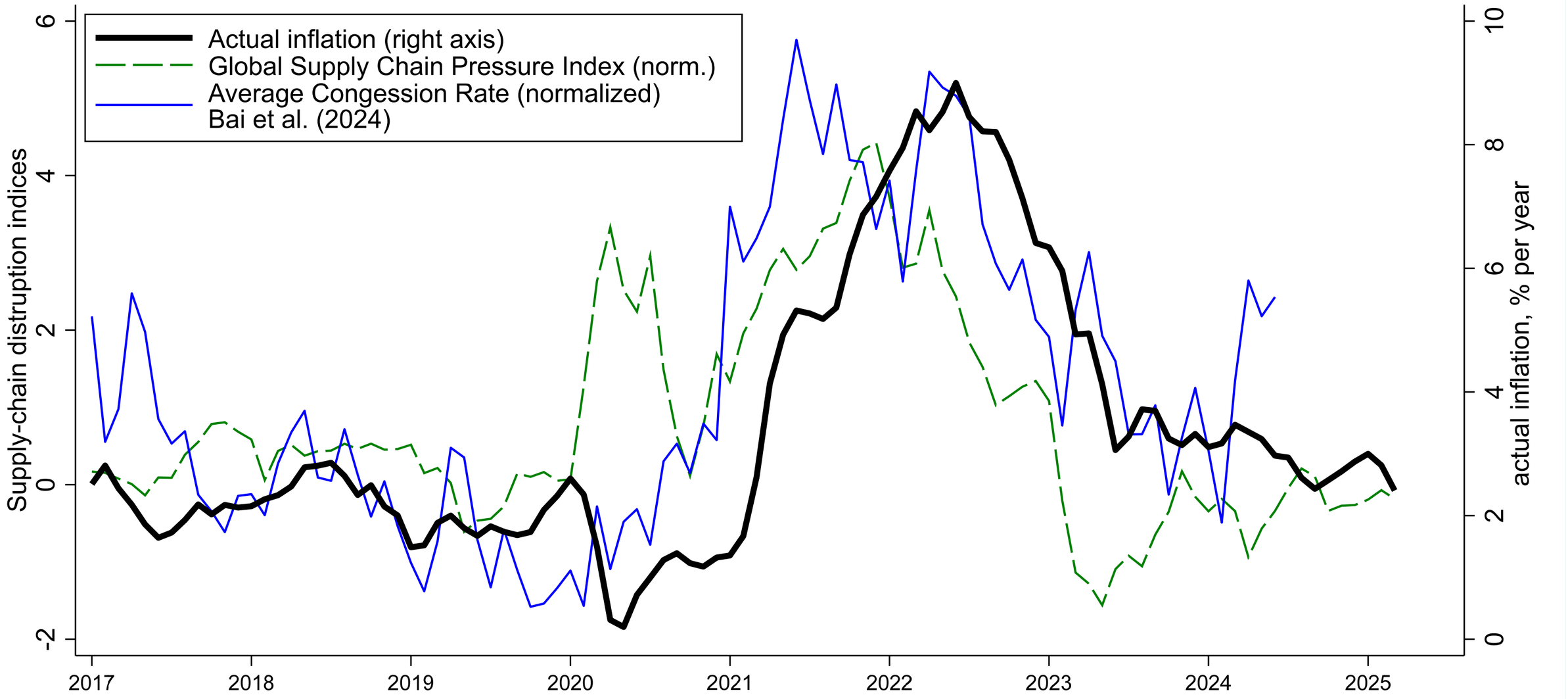
What are the cost-push shocks? Often "unknowns" but not this time: energy & supply-chain shocks

SUPPLY-CHAIN BOTTLENECKS AND COMMODITY PRICE SHOCKS



Russian aggression of Ukraine ⟹Natural gas prices ↑ ⟹ Fertilizer prices ↑⟹ Food prices ↑

SUPPLY-CHAIN BOTTLENECKS AND COMMODITY PRICE SHOCKS



Changes in the *composition* of demand ⟹ Shipping bottlenecks ↑ ⟹ goods/durables prices ↑

INFLATION AND INFLATION EXPECTATIONS

Most macroeconomic models linking nominal and real sides of the economy rely on some kind of expectations-augmented Phillips curve, e.g. the New Keynesian Phillips curve:

$$\pi_t \approx \underbrace{\pi^e_{t+1}}_{\substack{expected \\ inflation}} - \alpha \underbrace{(U_t - U_t^*)}_{\substack{unemployment \\ gap}} + \underbrace{\varepsilon_t}_{\substack{cost-push \\ shocks}}$$

Two characteristics common across the models:

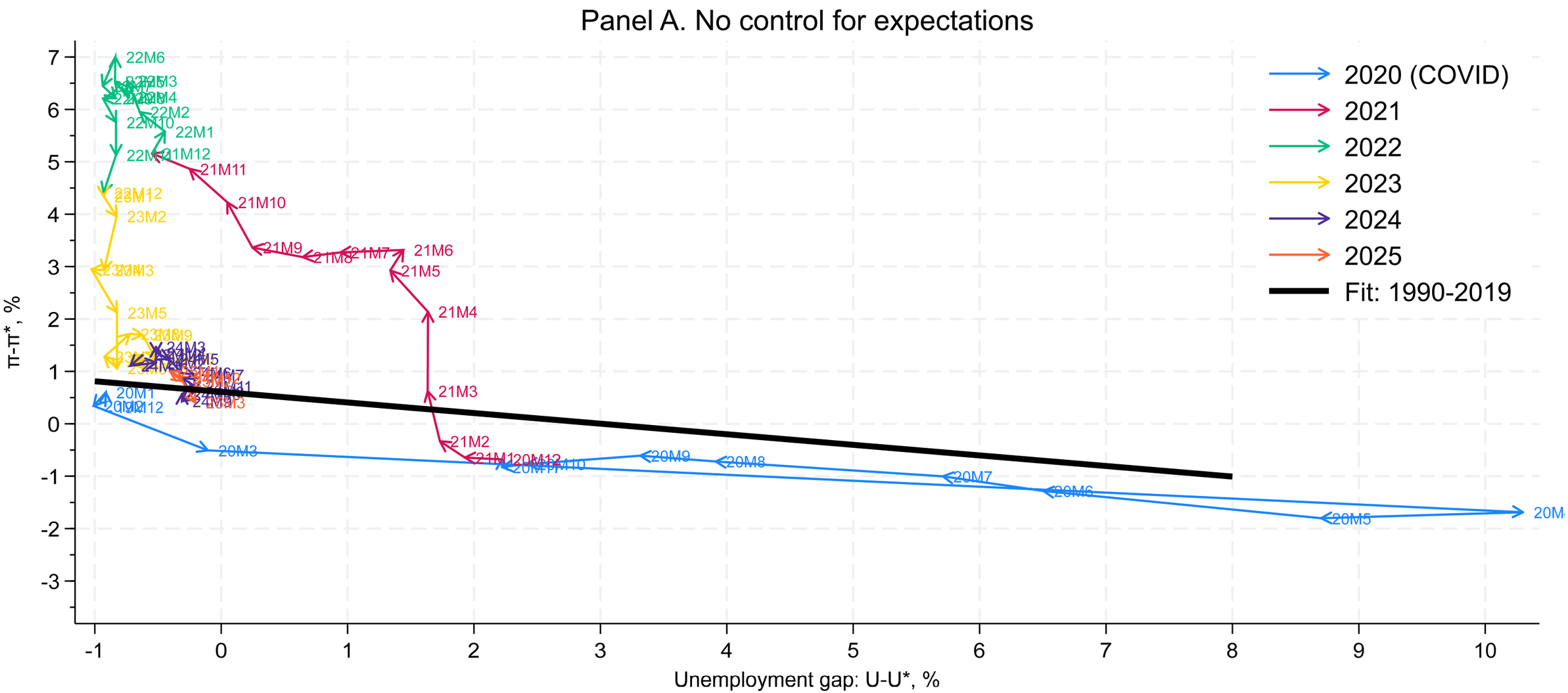
- It is the expectations of firms that matter most directly from price-setting decision.
- It is short-run expectations that matter most directly.

What are the cost-push shocks? Energy and supply-chain shocks

Alternative formulation:

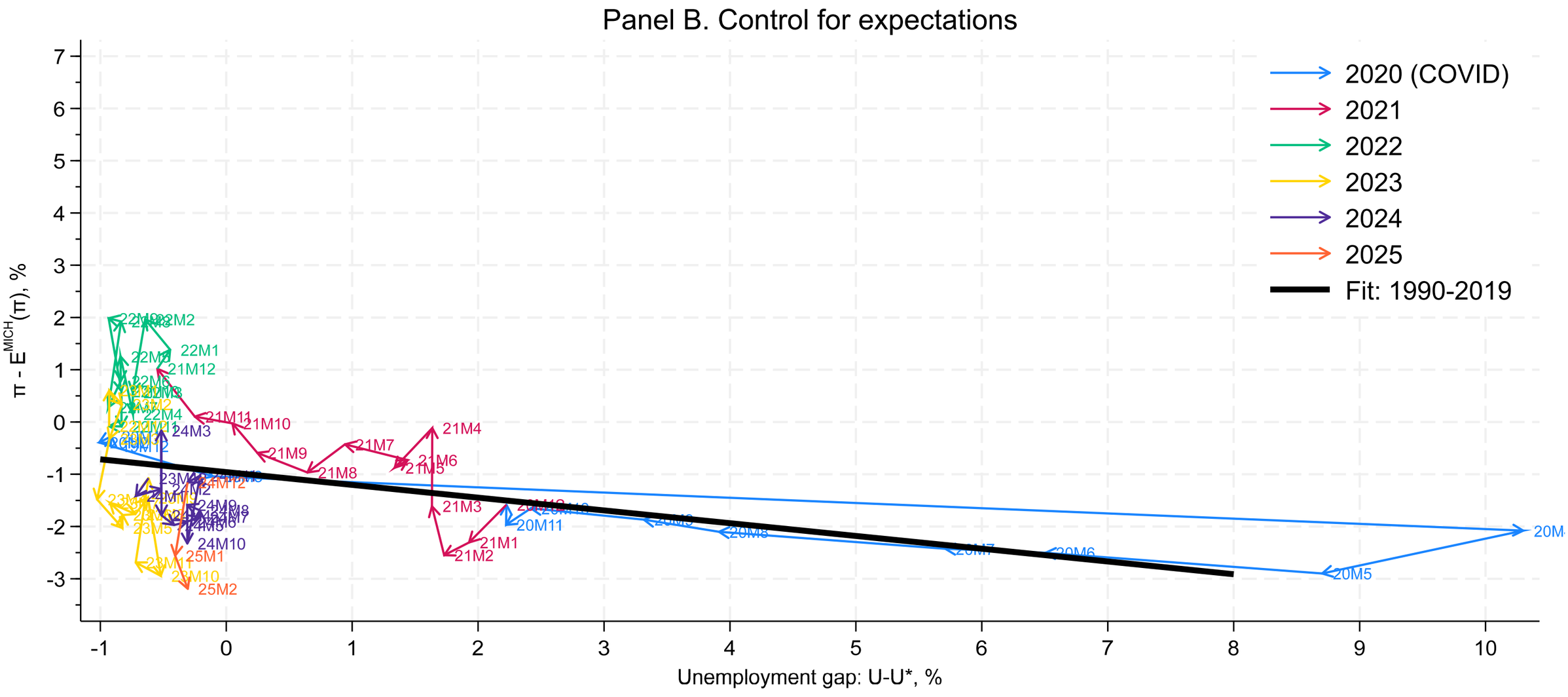
$$\underbrace{\pi_t - \underbrace{\pi^e_{t+1}}_{\substack{expected \\ inflation}}}_{inflation\ gap} = -\alpha \underbrace{(U_t - U_t^*)}_{\substack{unemployment \\ gap}} + \underbrace{\varepsilon_t}_{\substack{cost-push \\ shocks}}$$

The Surge via the Lens of a Phillips Curve



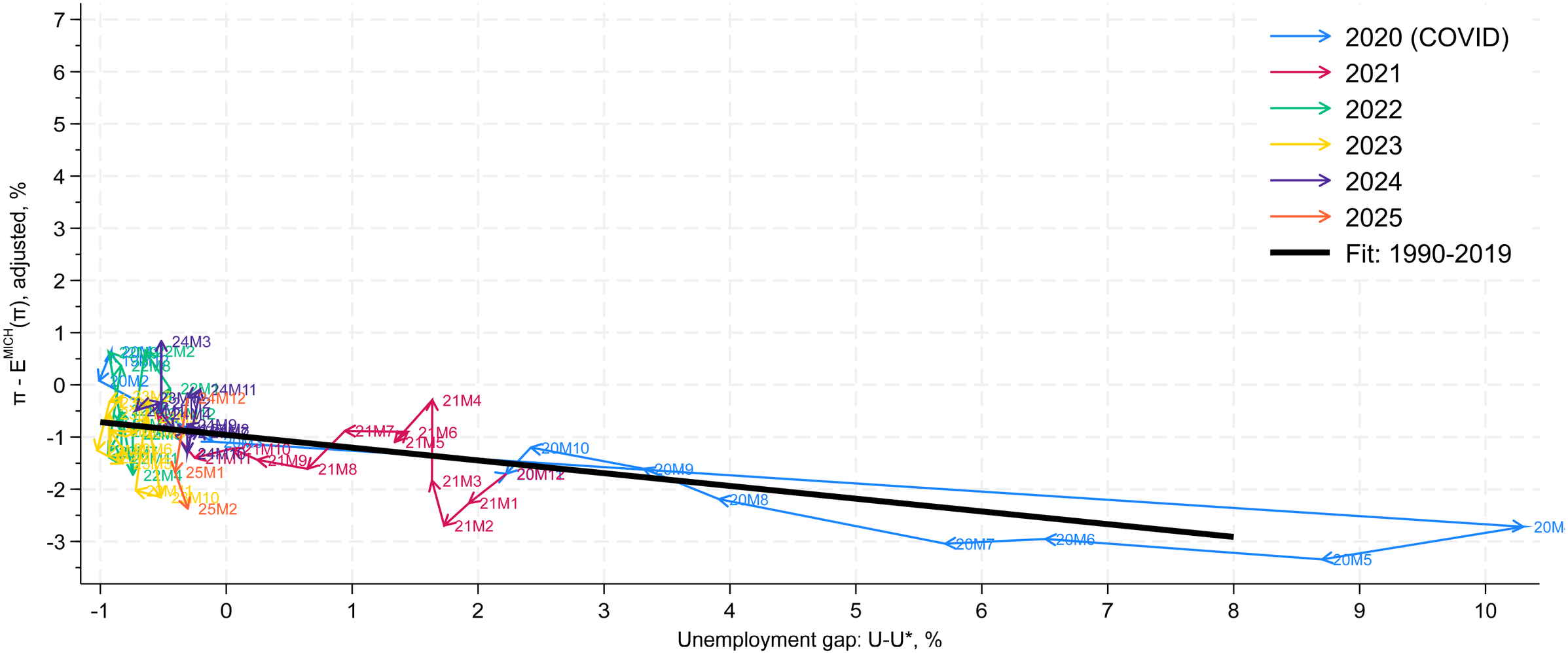
Without expectations or controls, the Phillips curve looks nonlinear and we move off the Phillips curve in early 2021 as inflation starts rising above & beyond anything suggested by labor markets.

The Surge via the Lens of a Phillips Curve



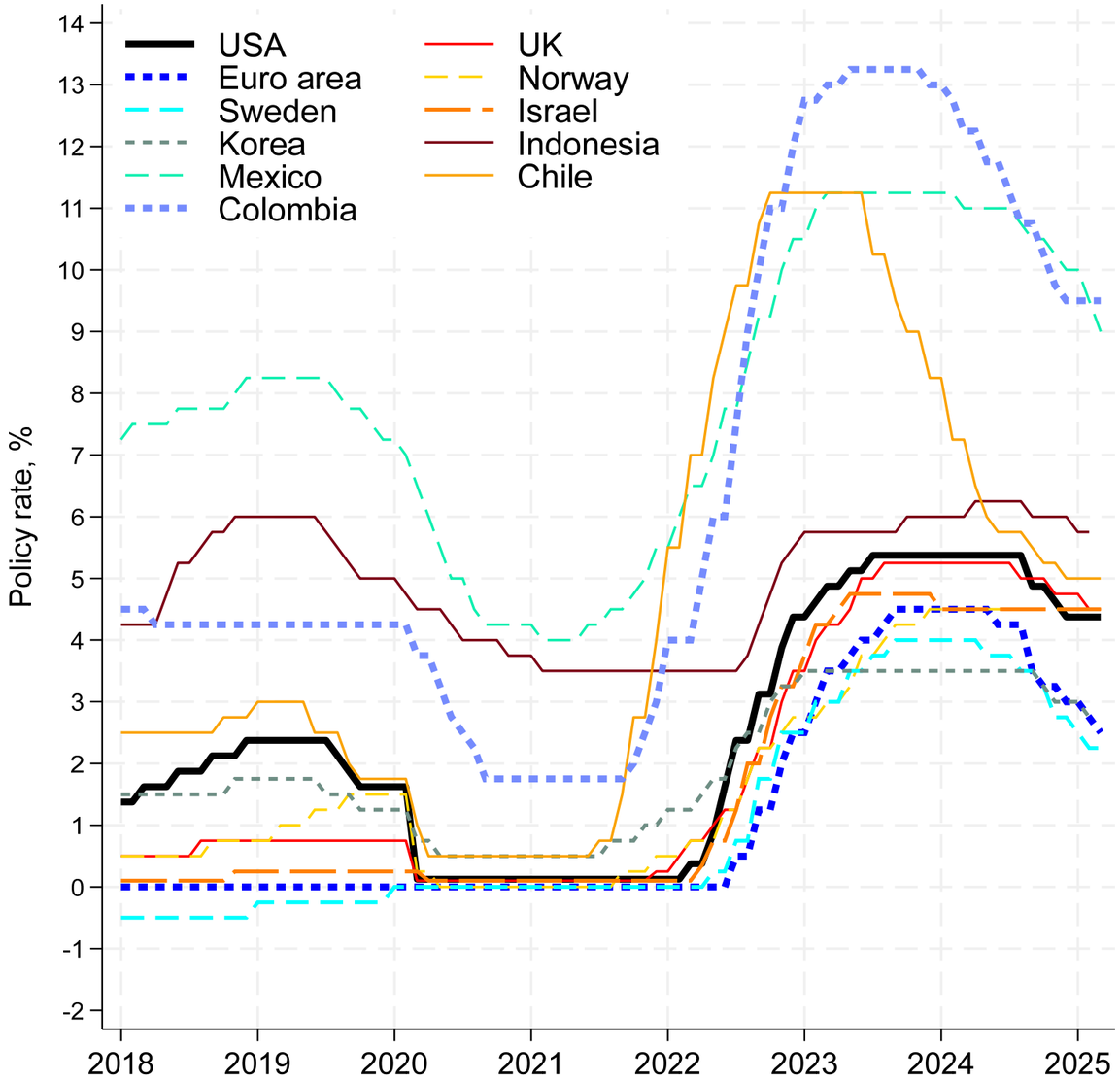
Controlling for inflation expectations, 2021 is a movement along the curve, until the 2022-24 supply shocks.

The Surge via the Lens of A Phillips Curve



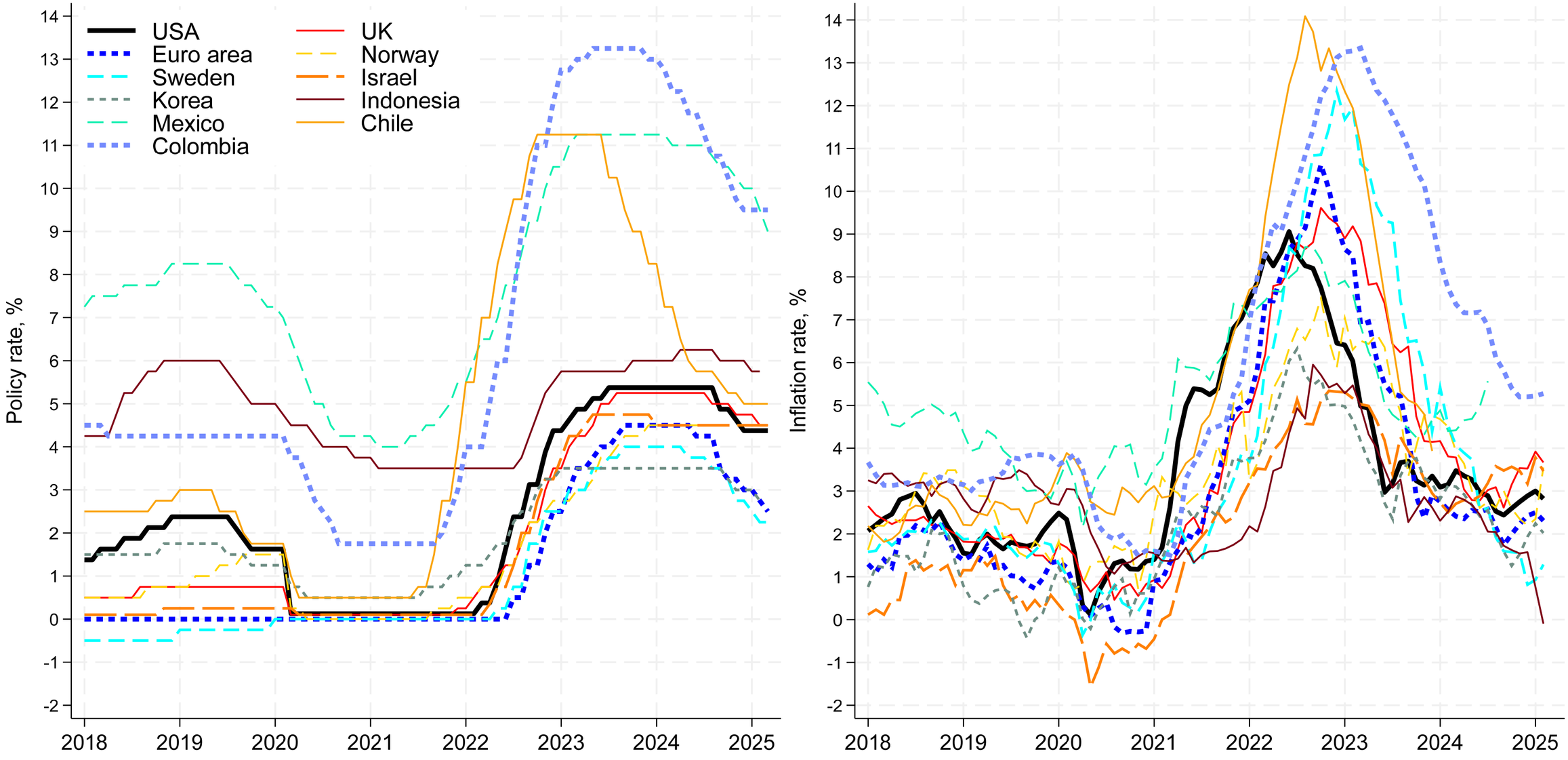
Controlling for inflation expectations *and* supply shocks, there is almost no unexplained variation left.

INTERNATIONAL EVIDENCE ON SUPPLY-SIDE FACTORS



Monetary policy decisions varied widely

INTERNATIONAL EVIDENCE ON SUPPLY-SIDE FACTORS



Monetary policy decisions varied widely whereas the inflation experience was surprisingly similar.

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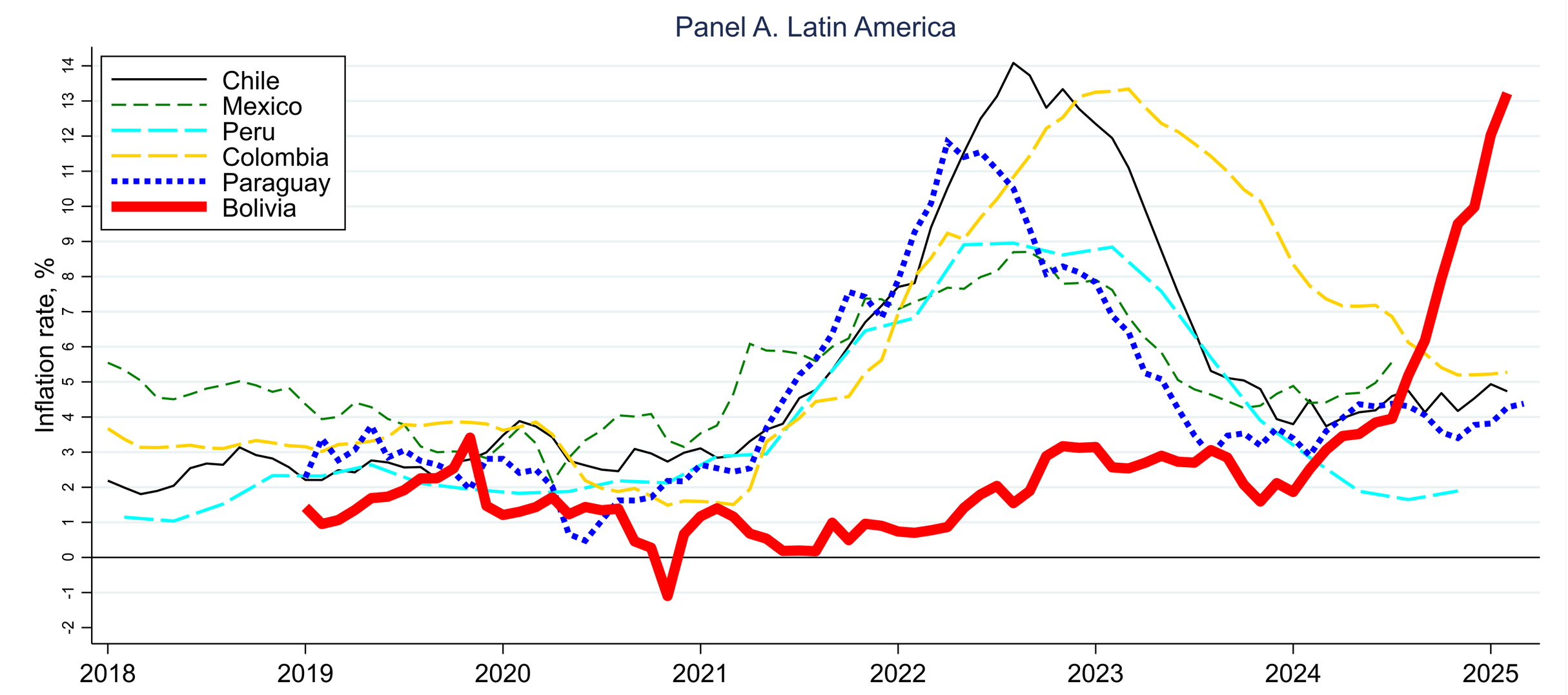
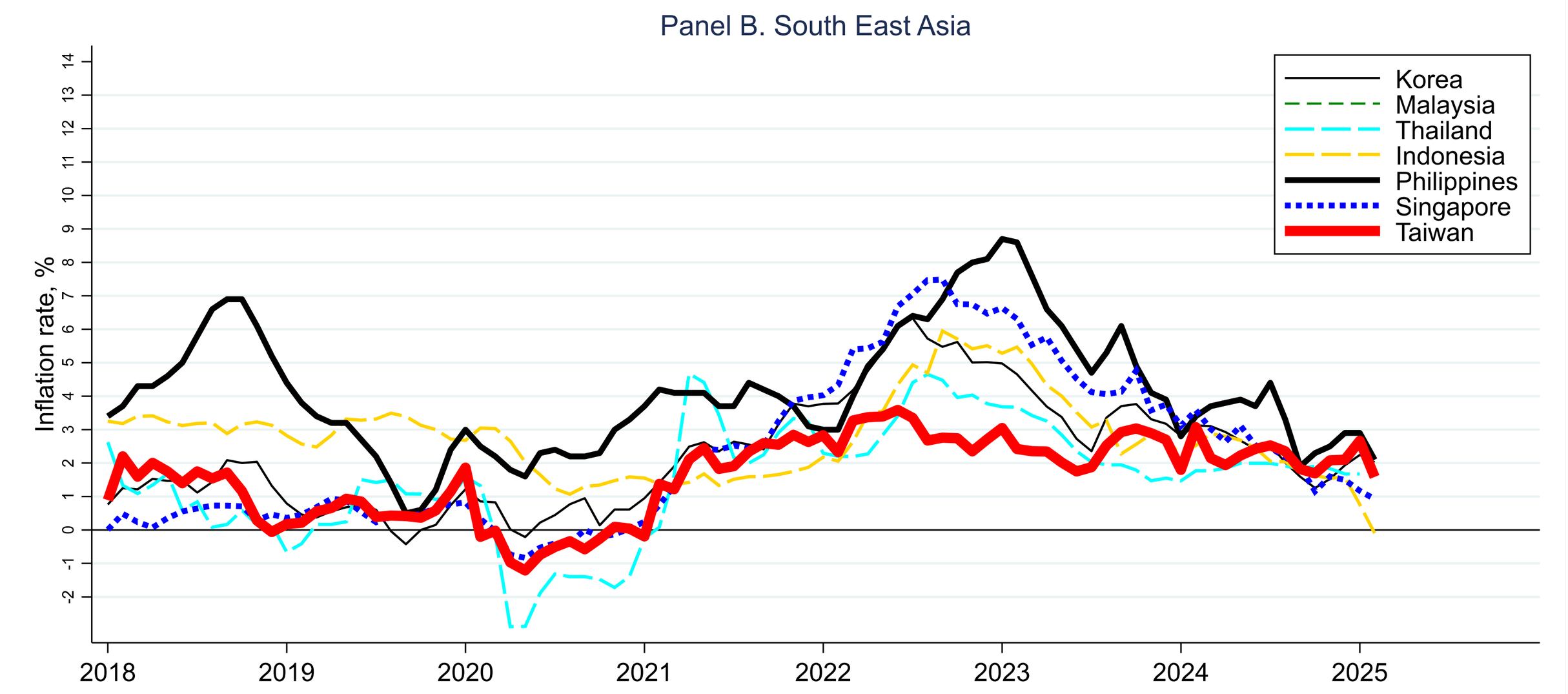


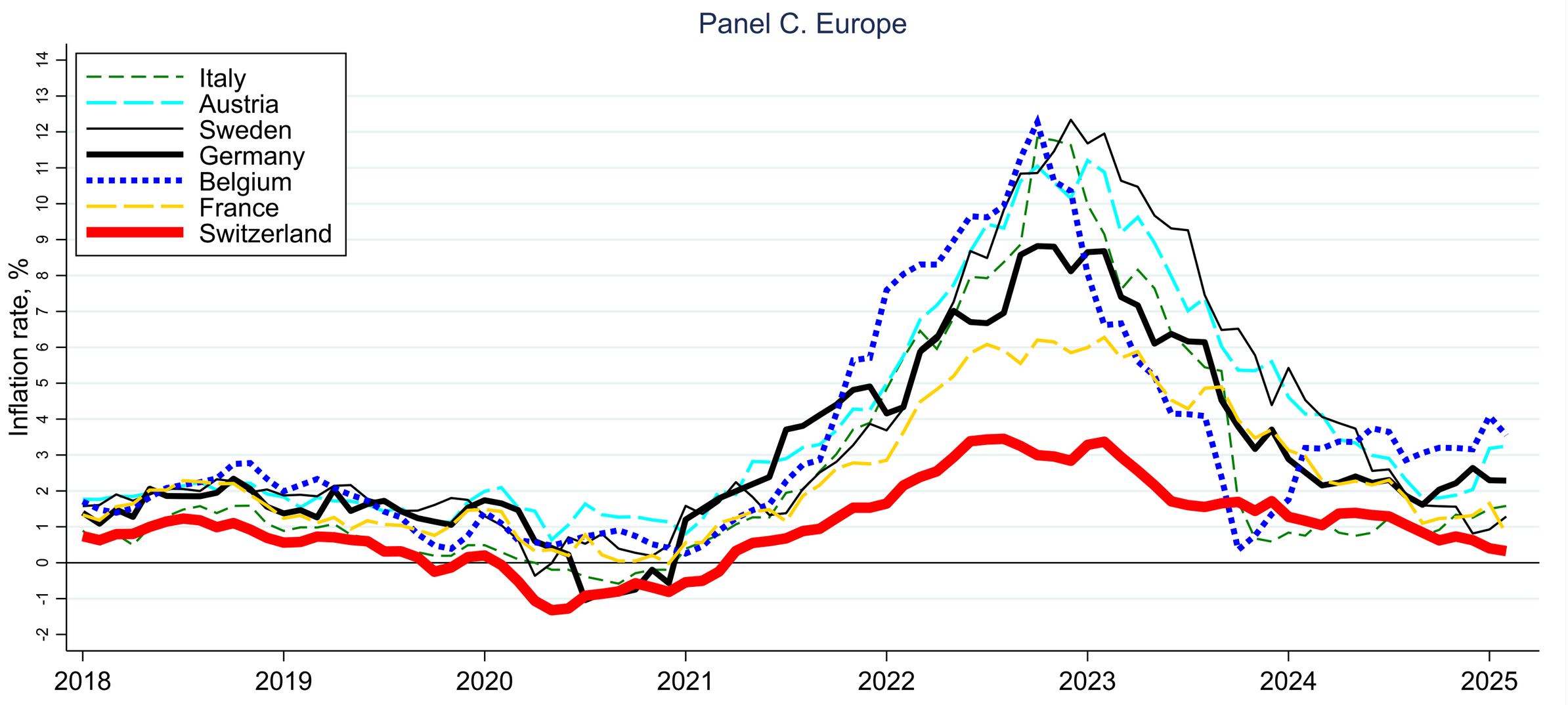
In Latin America, Bolivia was able to escape the initial surge through massive energy price subsidies.

INTERNATIONAL EVIDENCE ON SUPPLY-SIDE FACTORS



In Asia, Taiwan was able to escape the initial surge through massive energy price subsidies.

INTERNATIONAL EVIDENCE ON SUPPLY-SIDE FACTORS



In Europe, Switzerland escaped the inflation surge through reduced exposure and sensitivity to global energy prices.

TAKEAWAYS

- The inflation surge and subsequent disinflation were mostly a case of “bad luck followed by good luck” in a context of unanchored inflation expectations.

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- Can we do better next time?
  - Would a different framework better anchor inflation expectations?
  - How should we communicate about inflation in times like this?

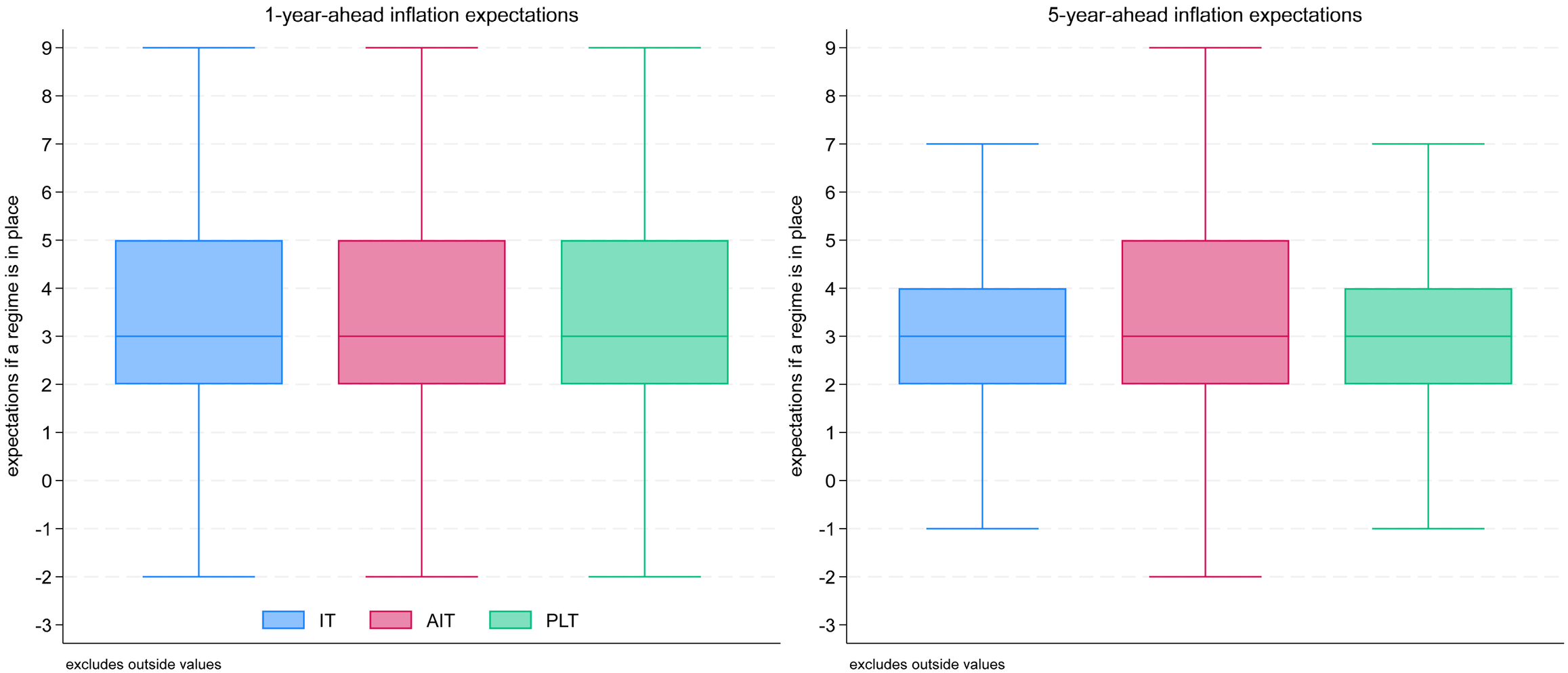
WOULD A DIFFERENT FRAMEWORK BETTER ANCHOR INFLATION EXPECTATIONS?

April 2025 survey of U.S. households:

"One framework that central banks sometimes use is known as Average Inflation Targeting ***[replace with IT or PLT]****. Effectively, this means that when inflation is below the central bank's target rate of inflation, that central bank will try to push inflation above the target for some time. And vice versa, when inflation is above the target, the central bank will try to push inflation below the target for some time.*

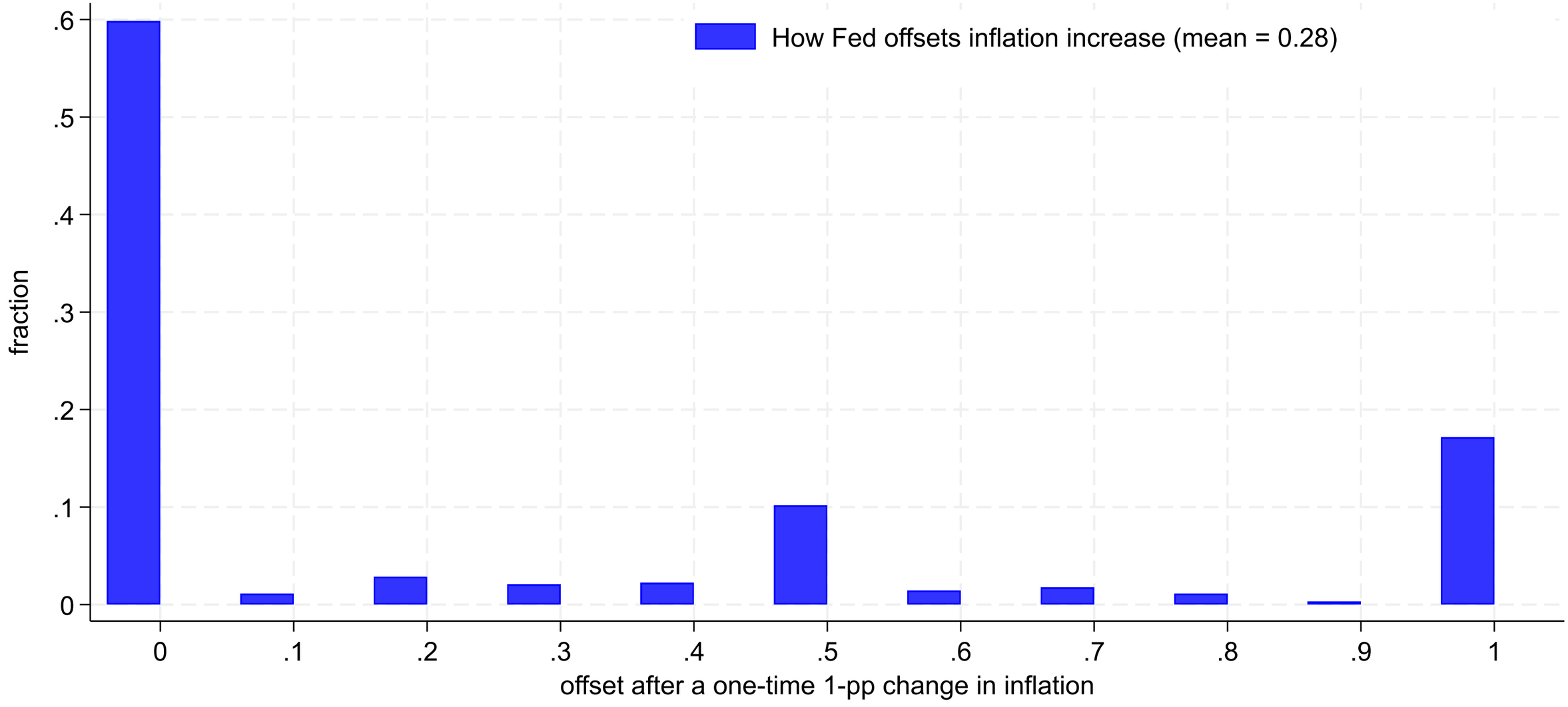
Earlier in the survey you indicated that your inflation forecast for the next 12 month is XXX [pipe the response from Q11]. If the Federal Reserve adopted Average Inflation Targeting with the inflation target of 2% per year, what inflation would you expect for the next 12 months as well as over the next 5 years on average?"

Would a Different Framework Better Anchor Inflation Expectations?



Framework does not seem to matter.

NUANCES: RESPONSE TO A ONE-TIME INFLATION SHOCK



People think the Fed is not offsetting one-time increase in the level of prices

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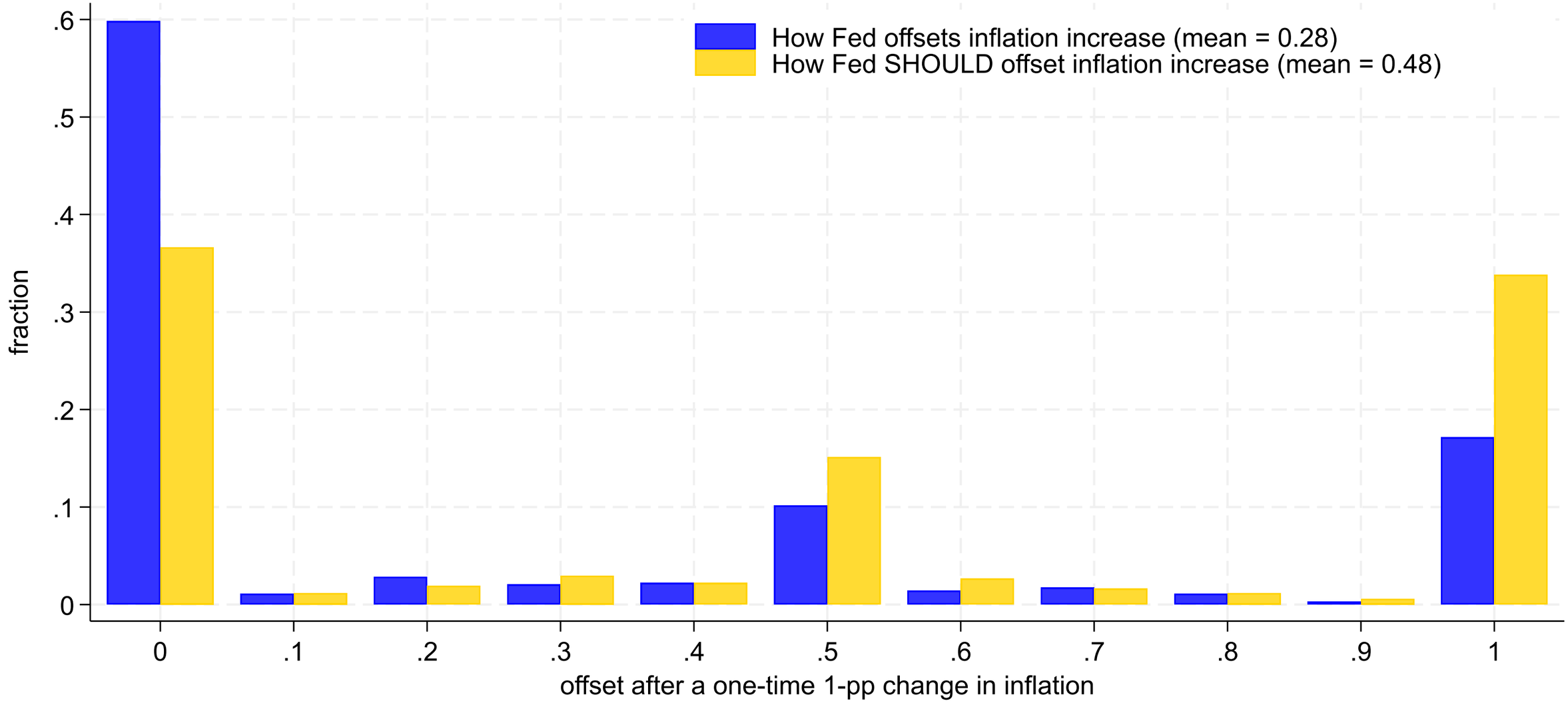

People think the Fed is not offsetting one-time increase in the level of prices

… but they also think the Fed should offset more ⟹ some demand for mean reversion.

BREAKING THE CYCLE OF SELECTIVE INATTENTION

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- It's probably too late before the next surge...

- A key question: When facing higher prices and weaker growth, what do you prioritize?

THEORY AND EXPERIENCE OF THE 1970S

- "To the extent that price setting today depends on beliefs about future economic conditions, a monetary authority that is able to signal a clear commitment to controlling inflation may face an improved short-run output/inflation trade-off." In "The Science of Monetary Policy" (1999) by Clarida, Gali and Gertler

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- "…the priority for policy was decisive action to deal with inflationary pressures and to defuse the dangerous expectational forces… the new measures should make abundantly clear … our desire to "wind down" inflationary pressures. … the question I receive most frequently is not why did you do it, but rather, "Will the Fed stick with it?" My own short and simple answer to that question is yes. I do not intend to qualify that answer." Paul Volcker (Nov 13, 1979)

CONCLUDING REMARKS

Much of monetary policy is built on anchoring inflation expectations to deliver

- Macroeconomic stabilization
- Cheap disinflation
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- Focus on long-term expectations of professional forecasters and financial markets may result in wishful thinking
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Policy framework should recognize unanchored expectations (and information/cognitive constraints of key agents in the economy) and respond to macro developments accordingly

- Break the cycle of selective inattention
- Focus on expectations that matter for (most) economic decisions
- Do not look through one-time supply-side shocks

Discussion of:

Inflation, Expectations and Monetary Policy: What Have We Learned and To What End?

---

by Oliver Coibion (UT Austin) and Yuriy Gorodnichenko (UC Berkeley)

Discussant: Mark Gertler (NYU)

Laubach Conference
May 2025

Summary

- Estimate Phillips curves using survey data on expectations:

$$\pi_t = -\alpha(u_t - u_t^*) + \beta \pi_{t+h}^e + \varepsilon_t$$

$\pi_{t+h}^e \equiv$ Survey measure at t of expected inflation over horizon h

Main Results:

1. Short-term expectations matter more than long-term
2. Household expectations $>$ firm expectations $>$ professional forecasts
3. Household and firm expectations are **unanchored**
4. Watch out! Households are signaling inflation!

Short vs Long Run Expectations and Anchoring

$\overline{\pi}_t \equiv E_t \pi_{t+\infty}$: Trend inflation
$\widehat{x}_t \equiv u_t - E_t u_{t+\infty}$: Cyclical unemployment

- Phillips curve with $\overline{\pi}_t$ (HHNS, 2022)

$$\pi_t = -\alpha\, \widehat{x}_t + \beta\, E_t \pi_{t+1} + (1-\beta)\, \overline{\pi}_t + \varepsilon_t$$

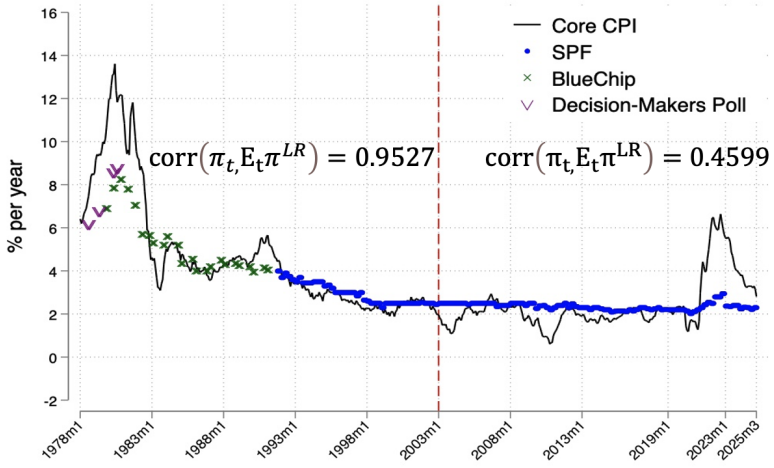
$$\widehat{x}_t = \rho\, \widehat{x}_{t-1} + \epsilon_t \quad \Longrightarrow$$

$$\pi_t = -\frac{\alpha}{1-\rho}\, \widehat{x}_t + \omega_t + \overline{\pi}_t$$

- Anchored expectations $\Longrightarrow \overline{\pi}_t = \pi^o$
- Whether trend-inflation expectations are anchored affects both π_t and $E_t \pi_{t+1}$.

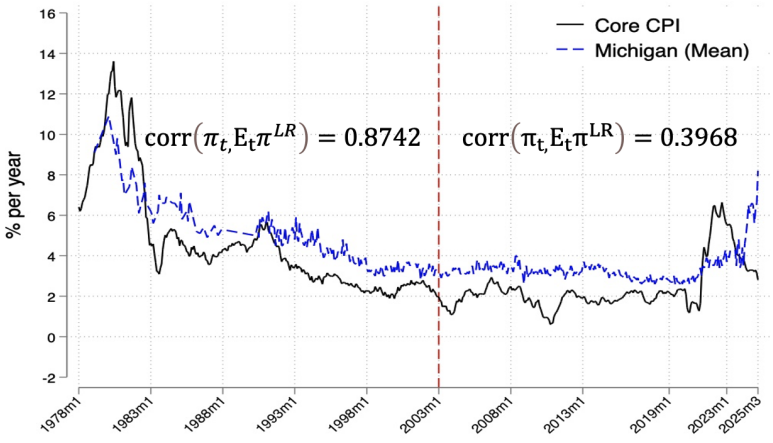
Unanchored vs. Anchored LR Inflation Expectations (Professionals)

Figure 1: 10-year Inflation Expectations vs. Inflation: SPF



Unanchored vs. Anchored (?) LR Inflation Expectations (Households)

Figure 2: 5 to 10-year Inflation Expectations vs. Inflation: Households



Pass-Thru of SR into LR Inflation Expectations: Pre vs. Post 2003

$$E_t\pi^{LR} = \alpha + \beta E_t\pi^{SR} + \varepsilon_t$$

	Professionals		Households	
$E_t\pi^{SR}$	0.7550***	0.2298***	0.8057 ***	0.3753***
	(0.05)	(0.05)	(0.04)	(0.09)
Sample	1978–2002	2003–2025	1978–2002	2003–2025
N	67	89	72	89
R^2	0.921	0.307	0.804	0.372

Notes: $E_t\pi^{SR}$ is the one-year-ahead expectation from households (MSC, mean response) or professionals (SPF/BlueChip). $E_t\pi^{LR}$ is the longer-run expectation: 10-year-ahead for professionals (SPF; Livingston pre-1991) and 5–10-year-ahead for households.Robust standard errors are reported in parentheses. ***,**,* denote statistical significance at 1, 5, and 10 percent levels.

GC estimates of Pass-Thru post 2005

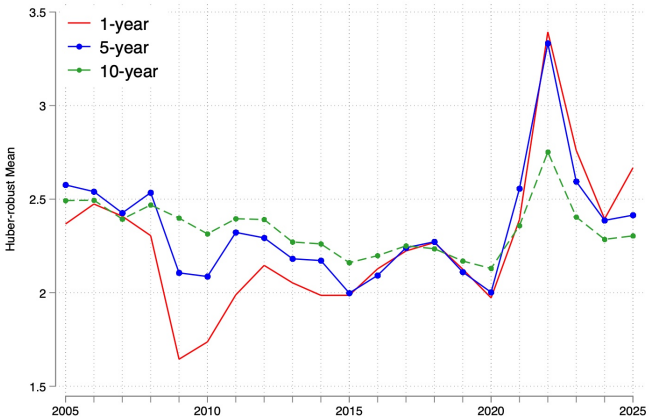
- GC estimate using panels of individual forecasters on post 2004 data.

$$E_{it}\pi^{LR} = b_t + \rho_t E_{it}\pi^{SR} + \epsilon_t, \qquad b_t \equiv \text{time fixed effect}$$

- GC consider 5-year SPF forecast instead of 10-year.
  - Find high pass-thru for 5-year i.e. $\rho_t \in (0.4, 0, 8)$
  - Problematic: No control for individual heterogeneity
  - However, I find similar estimates from time series regressions
    - High pass-thru for 5-year (despite low pass-thru for 10-year)
    - Pass-thru roughly 0.38 for households (also similar to GC)
- How do we interpret low pass thru into 10-year and high into 5-year?
  - Key: Fed targets a range $1.5 \sim 2.5$ not a single number.

Pass-Thru into 5-year vs. 10-year Expectations: SPF

Figure 3: Mean 1, 5, 10-year forecasts (SPF)



- Time-series Regression

$$\overline{E_{it}\pi_{t+h}} = b_0 + \rho\,\overline{E_{it}\pi_{t+1}} + \varepsilon_t$$

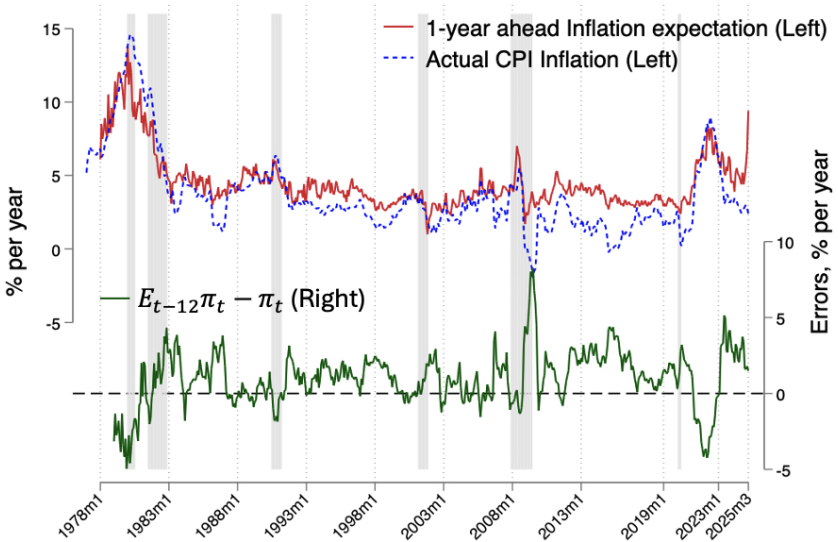
- Estimated ρ
  - SPF
    - 5-year = 0.7075
    - 10-year = 0.2401

Whose Expectations Matter?

$$\pi_t = -\alpha\left(u_t - u_t^*\right) + \beta\,\pi_{t+h}^e + \varepsilon_t$$

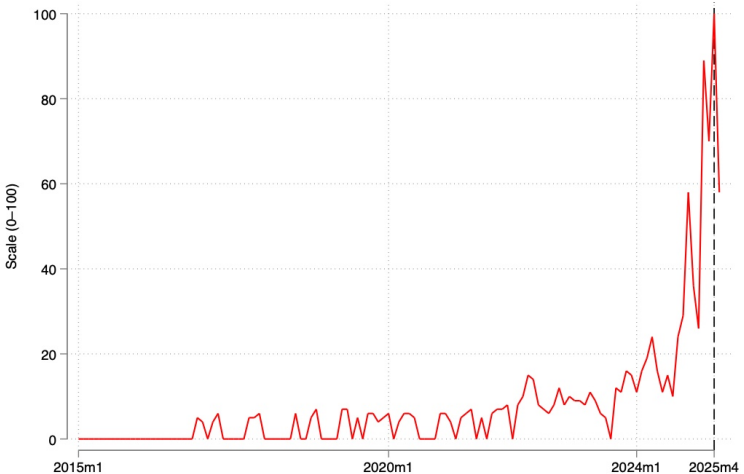
- Answer: Households!
  - **MSC (households):** $\hat{\beta} = 1.50^{***}$, $R^2 = 0.72$
  - **SPF (professionals):** $\hat{\beta} = 0.96^{***}$, $R^2 = 0.27$
  - MCS beats SPF in horserace
- Issues
  - Reverse causality? (Estimation is by OLS)
    - Could household forecasts be more sensitive to current inflation?
    - To be fair, in other work CG identify exogenous variation in expectations
  - Endogeneity + measurement error
    - Likely upward bias in $\widehat{\beta}$ and downward bias in $\widehat{\alpha} \rightarrow$ Counterfactuals problematic
  - Large firms more likely to use professional forecasts?
    - 10 largest firms account for 41% of sales (Alvarez-Blaser *et al.*)

One-year Inflation Forecast vs. Inflation: Households

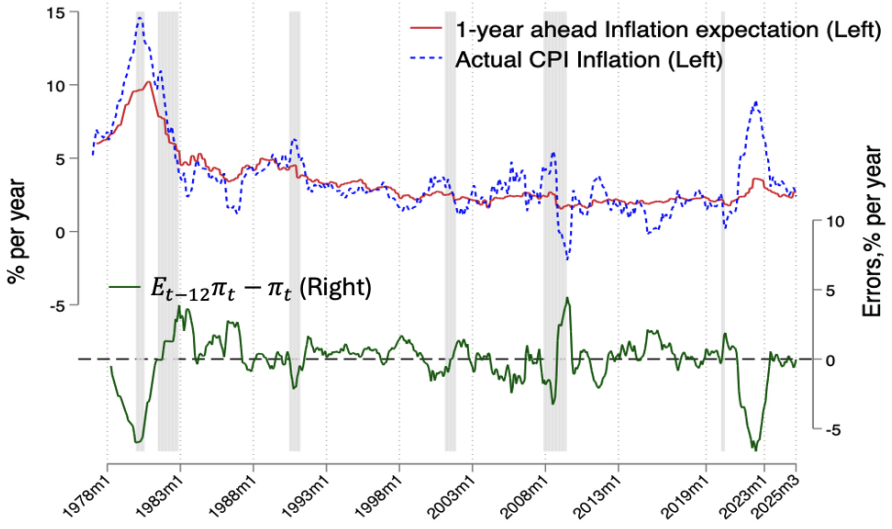


What could be driving MSC's forecast of high inflation

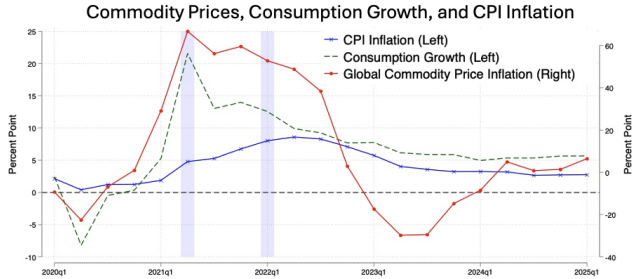
Figure 4: Google Trends: Tariffs and Inflation, 2015m1 - 2025m4

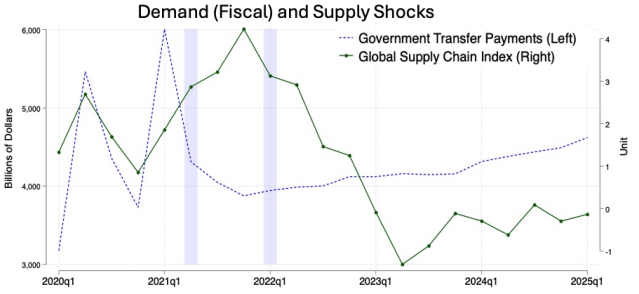


One-year Inflation Forecast vs. Inflation: Professionals



Supply and Demand Shocks in Inflation Surge



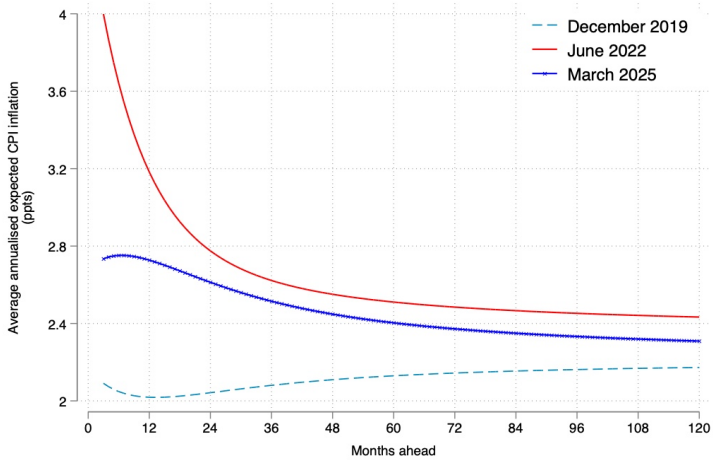


Concluding Remarks

- Interesting and significant research
- (My View) important to keep long term inflation expectations anchored
  - But agree we need more work on whose expectations matter for price setting
  - Will involve modeling how beliefs are formed to sort out causality
- Need to figure out what is going on with Michigan households!

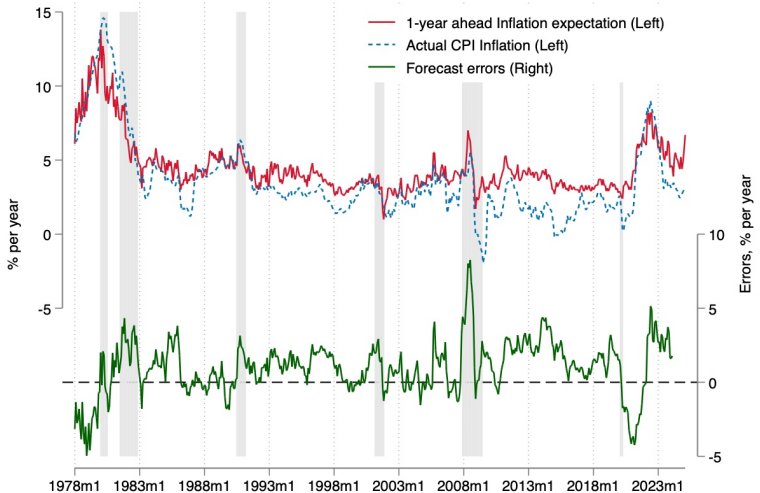
Inflation Expectations Term Structure

Figure 5: Expectation Term Structure, Professional Forecasters



Extra Slides: Forecast errors for Households

Figure 6: $E_t\pi_{t+12} - \pi_{t+12}$, Households



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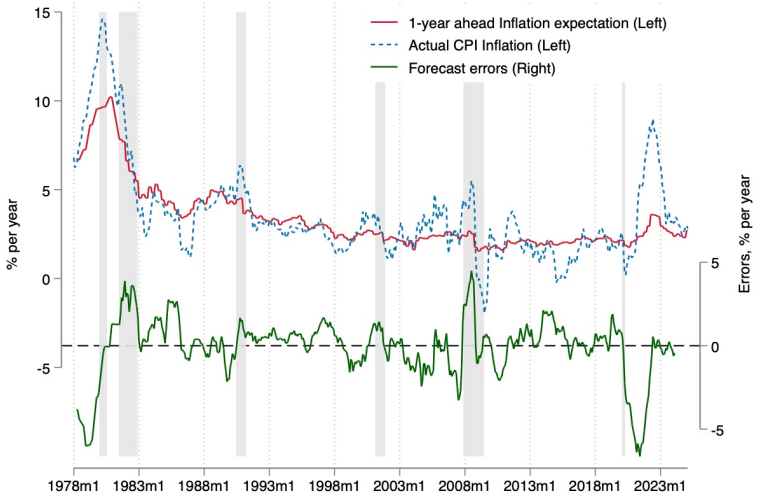

Session 2: Inflation Dynamics and Inflation Expectations

Q&A

Moderator: Sylvain Leduc, Federal Reserve Bank of San Francisco
Presenter: Yuriy Gorodnichenko, University of California, Berkeley
Discussant: Mark Gertler, New York University

Thomas Laubach
RESEARCH CONFERENCE