

Discussion of **Bond Market Views of the Fed**

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May 1/2, 2025

- ▶ *Did financial markets perceive a shift in the Fed's inflation stance around 2020?*
- ▶ The Fed viewed as more tolerant of inflation in 2020–2022:
Estimated Taylor rule response to inflation fell *by 30%-50%*.

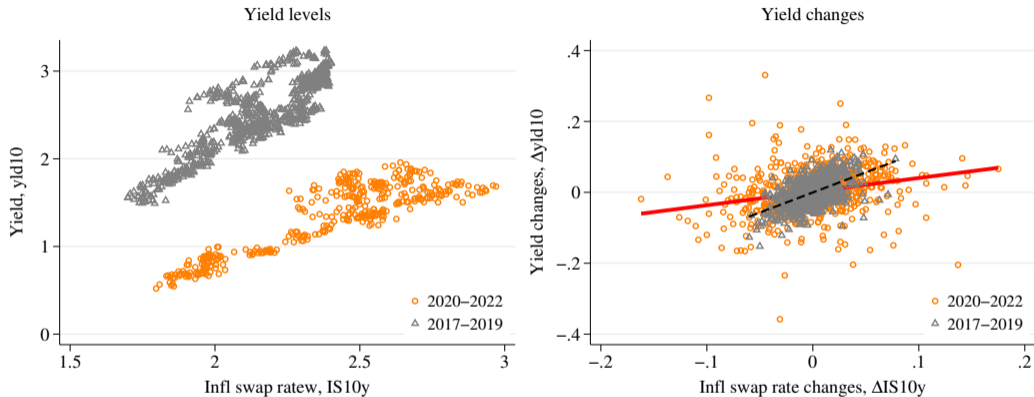
- ▶ *Did financial markets perceive a shift in the Fed's inflation stance around 2020?*
- ▶ The Fed viewed as more tolerant of inflation in 2020–2022:
Estimated Taylor rule response to inflation fell *by 30%-50%*.
- ▶ *If so, how much did this shift contribute to rising inflation?*
- ▶ NK model with regime shifts:
About half of inflation surge attributed to the perceived Fed's dovish shift.
- ▶ Counterfactual:
If the Fed kept pre-2020 reaction function, inflation would have peaked at *5% not 9%*.

Important and very timely paper. Policymakers should take a note.

1. Review of main sensitivity estimates
2. The Fed's 2020 framework
3. Market perceptions of policy: reaction function uncertainty
4. Simple model of the Fed and the market

Note: I draw on Cieslak, McMahon and Pang (2024, Brookings) and Cieslak (2024, Jackson Hole)

Main empirical result



- ▶ Main fact: Sensitivity of yields to inflation beliefs declined post 2020
- ▶ Interpretation: Markets perceived a lower Taylor rule response to inflation

Main empirical result

Dependent variable: $\Delta y_t^{(10),adj.}$

	TIPS brkeven	Infl swap
2000-2003 $\times \Delta \bar{\pi}$	1.54*** (36.94)	
2004-2007 $\times \Delta \bar{\pi}$	1.37*** (14.98)	0.31*** (4.29)
2008-2011 $\times \Delta \bar{\pi}$	1.36*** (15.31)	0.36** (2.33)
2012-2015 $\times \Delta \bar{\pi}$	1.48*** (15.29)	1.10*** (11.28)
2016-2019 $\times \Delta \bar{\pi}$	1.56*** (17.74)	1.43*** (15.02)
2020-2022 $\times \Delta \bar{\pi}$	1.02*** (9.26)	0.79*** (6.59)
R^2	0.38	0.11
N	5585	4398

Dropped: 2008:9–2008:11, 2020:1–2020:6

► Main regression

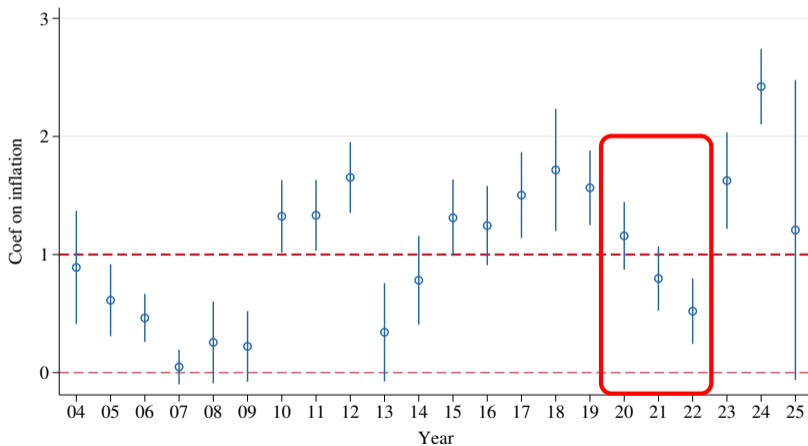
$$\Delta y_t^{(10),adj.} = c + \sum_s \psi_s \times D_{t,s} \times \Delta \pi_t^{(10),adj.} + e_t$$

adj. = adjusted for annual horizon and policy inertia

- Coefficient drops significantly in 2020–2022
- Larger drop for inflation swaps than TIPS ($\psi_{IS} < 1$)
- *Use inflation swaps*: TIPS regressions likely affected by Treasury convenience (see 2004–2008)

Main empirical result

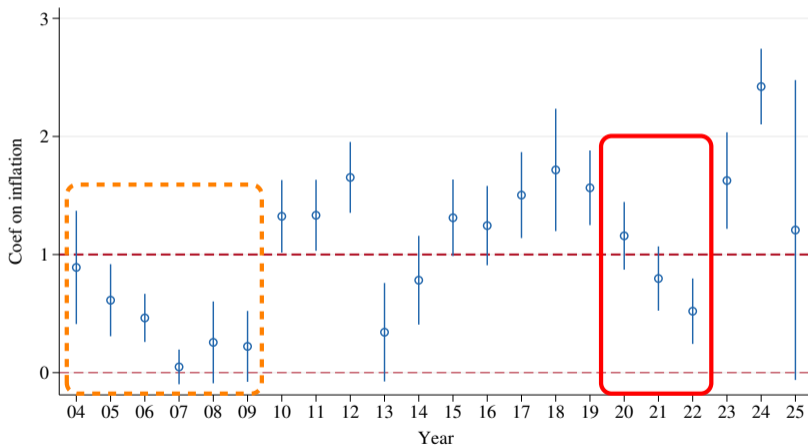
$$\Delta y_t^{(10),\text{adj.}} = c + \psi_{\text{year}} \times \Delta \pi_t^{(10),\text{adj.}} + e_t, \quad \text{estimated year-by-year, inflation swap}$$



► Significant drop in 2020-2022

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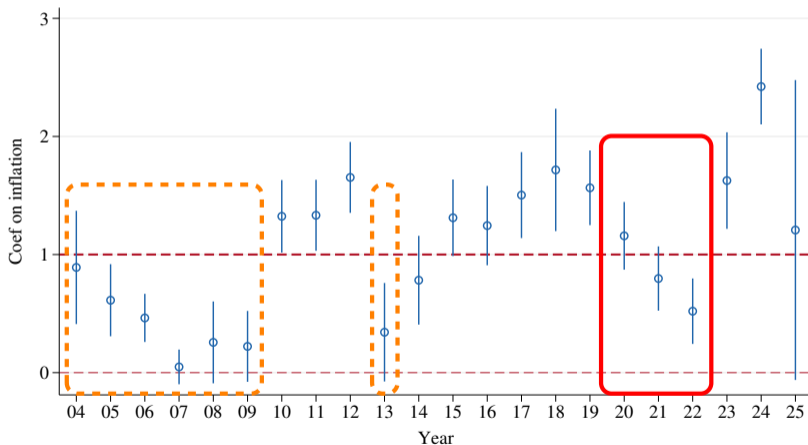
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- Significant drop in 2020-2022, though not unusual by historical standards

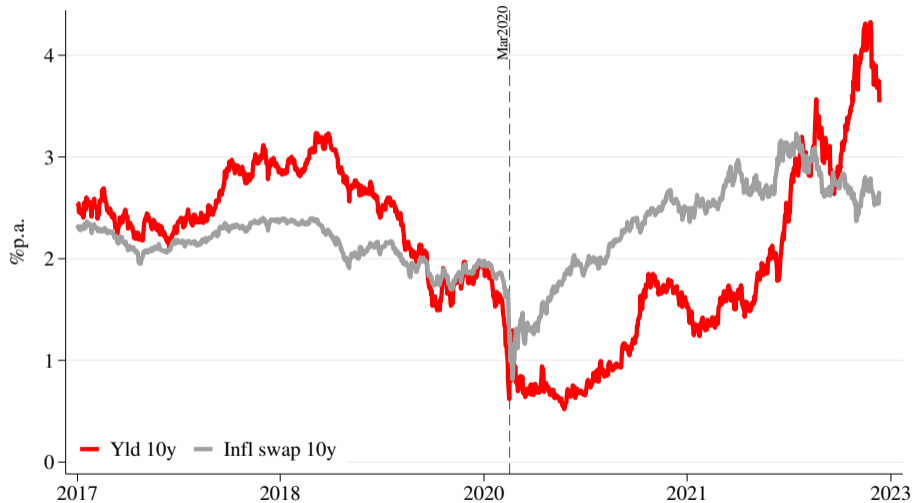
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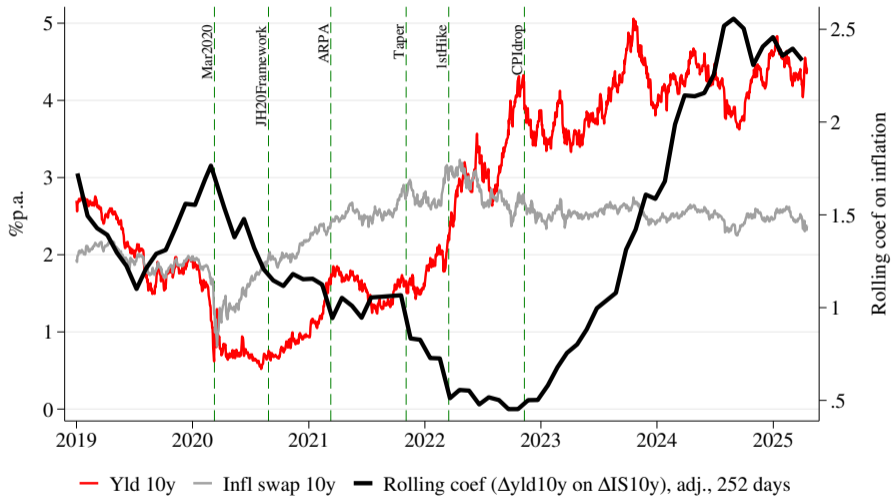
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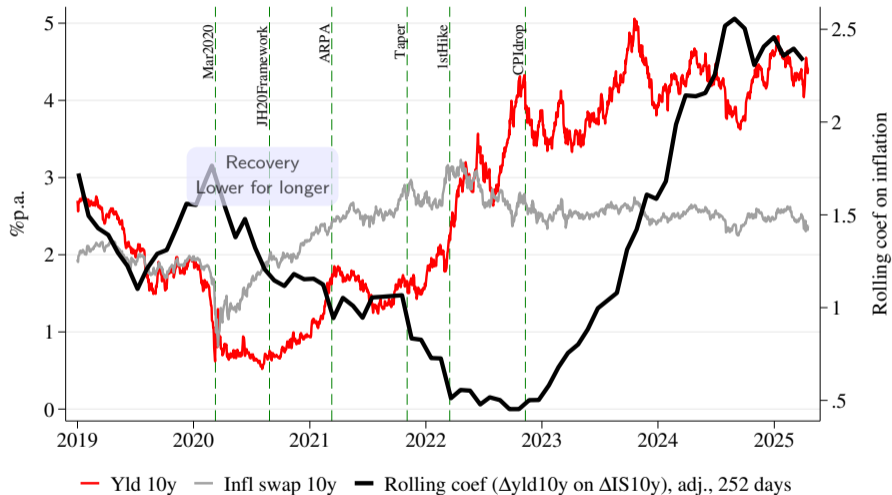


Yields – inflation swaps disconnect 2020-2022



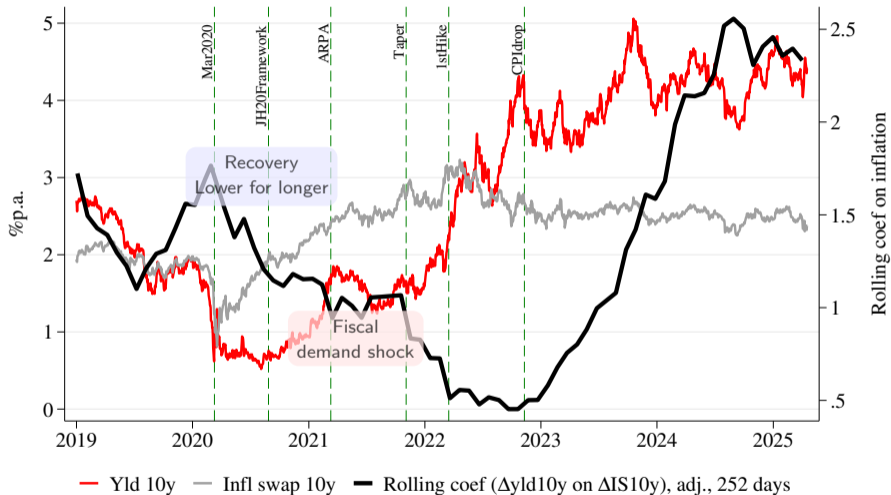
► Channels: Reaction function uncertainty → term premia; tightening → lower expected inflation

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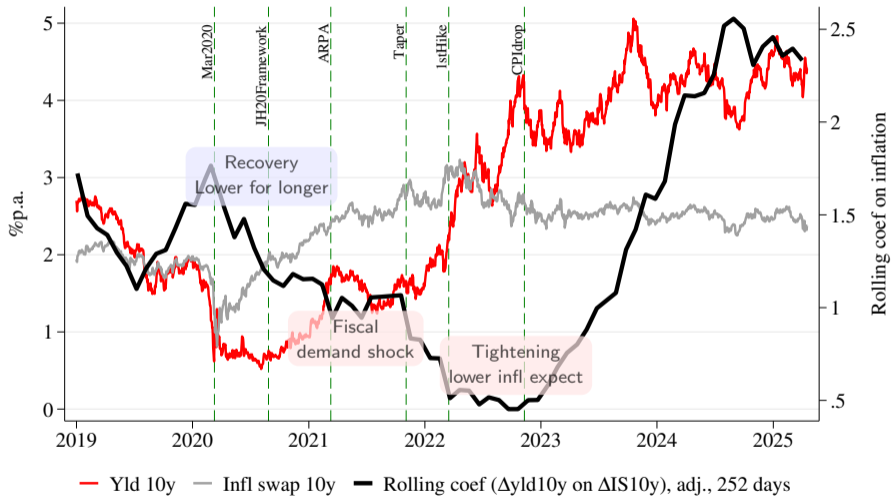
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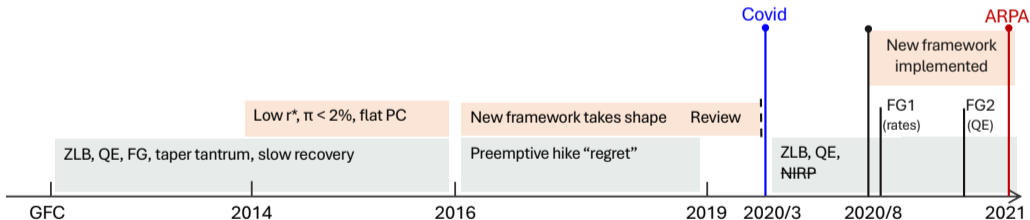
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Origins of the Fed's delayed response to inflation post-Covid

- ▶ Chair Powell announced “**new**” **framework** in Aug 2020 in Jackson Hole
- ▶ Key element – Asymmetry
 - Employment shortfalls
 - **F**lexible **A**verage **I**nflation **T**argeting (FAIT): no preemption on expected inflation
- ▶ Leading scenario: demand shocks (complementary inflation-employment objectives)

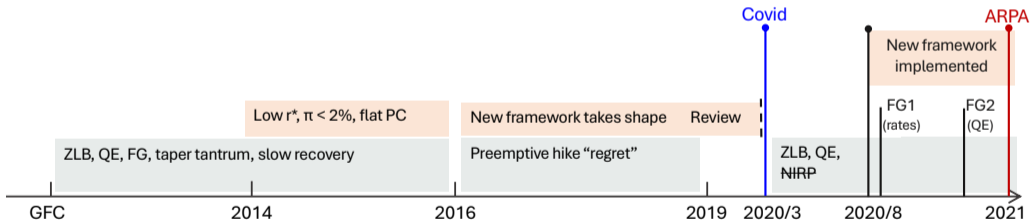
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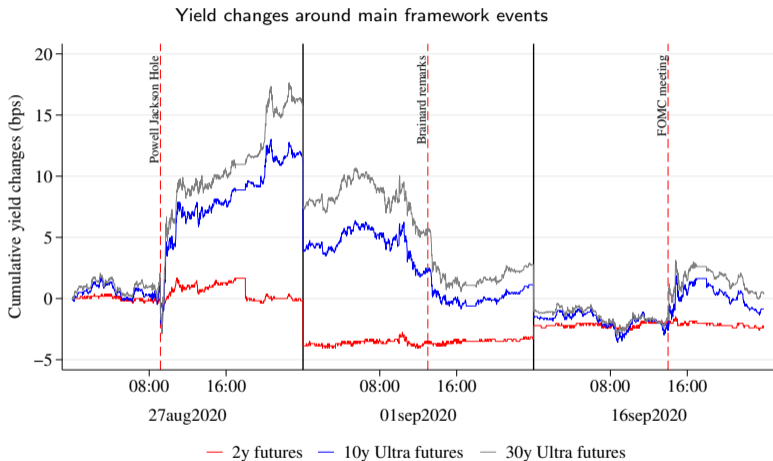
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- ▶ FAIT was unspecific about implementation; challenging to explain to market
- ▶ Inconsistent communication sowed *uncertainty about Fed's reaction function*

Framework announcement: Aug 27 – Sep 16, 2020



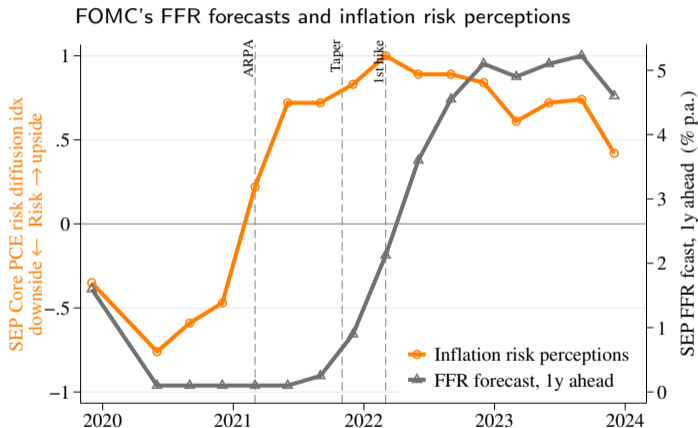
Inflation swap rate 10y		
Date	Rate (%)	Change (bps)
Aug 26	1.96	...
Aug 27	1.97	+1.3
Aug 28	2.00	+3.2
Aug 31	2.04	+3.3
Sep 1	2.01	-2.2
Sep 2	1.98	-3.3
...
Sep 15	1.94	...
Sep 16	1.95	+1.0
Sep 17	1.94	-1.2

- ▶ Yield curve: stable medium-term short-rate expectations (2yr) but temporarily increased term premium
- ▶ No change in inflation swap rates ~ stable long-term inflation expectations

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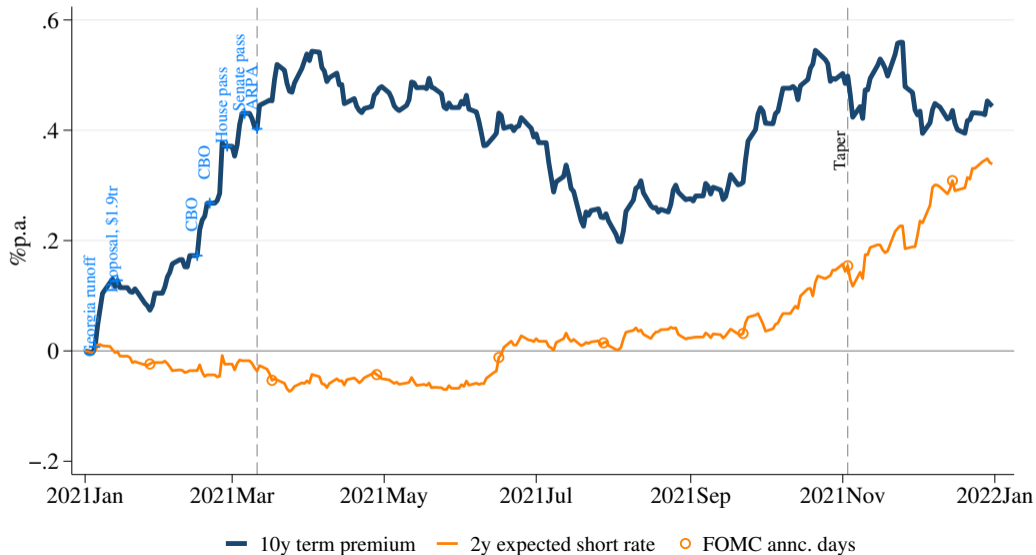
- ▶ “New” framework paused Fed's management of upper tail inflation risk (no preemption)
- ▶ Ex-post policy mistake by delaying action against inflation (acknowledge real-time uncertainty)
 - Constraints from framework + forward guidance
 - Escape clauses available but difficult to access
 - Underestimate of excess demand from fiscal stimulus, overestimate of slack
- ▶ Market perceptions
 - Inflation overshoot and lower-for-longer clearly communicated
 - Longer-term inflation expectation remained remarkably stable
 - Uncertainty about Fed's inflation response in 2021 ↑: term premia ↑

Framework + forward guidance paused Fed's risk management

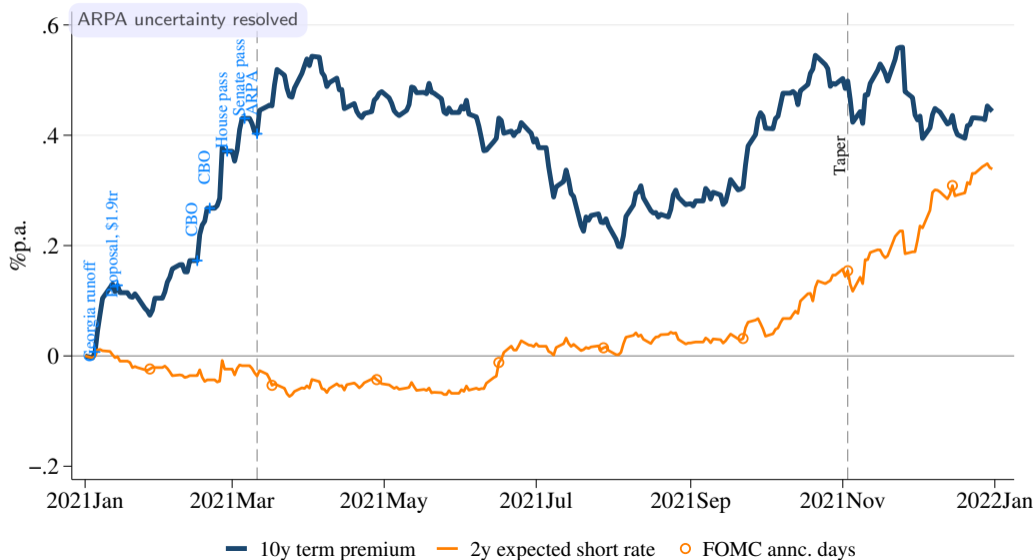


- ▶ FOMC perceived upside inflation risks from early 2021 (highest on record; employment risks viewed as balanced)
- ▶ But communicated lower-for-longer

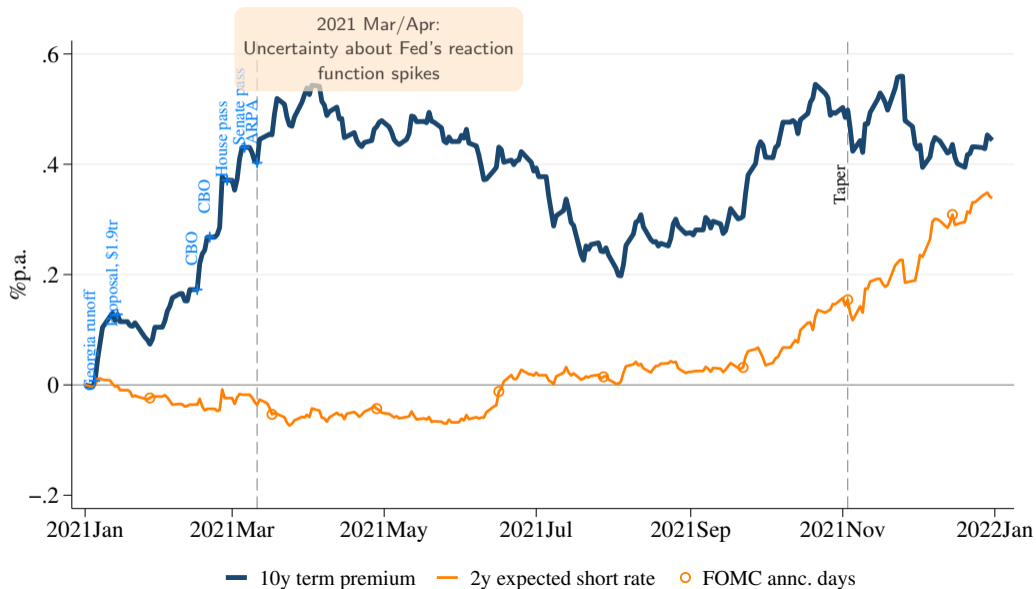
Reaction function uncertainty around ARPA 2021



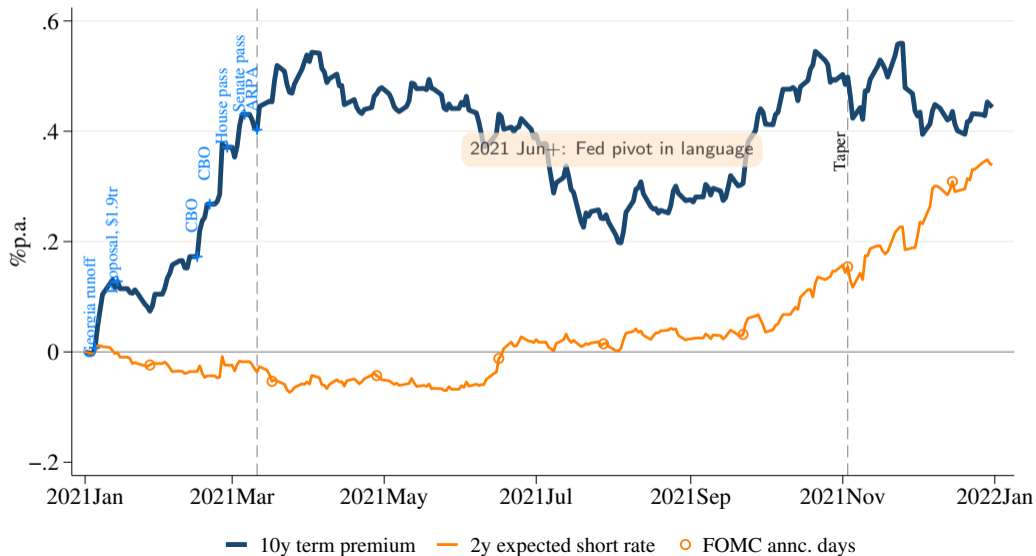
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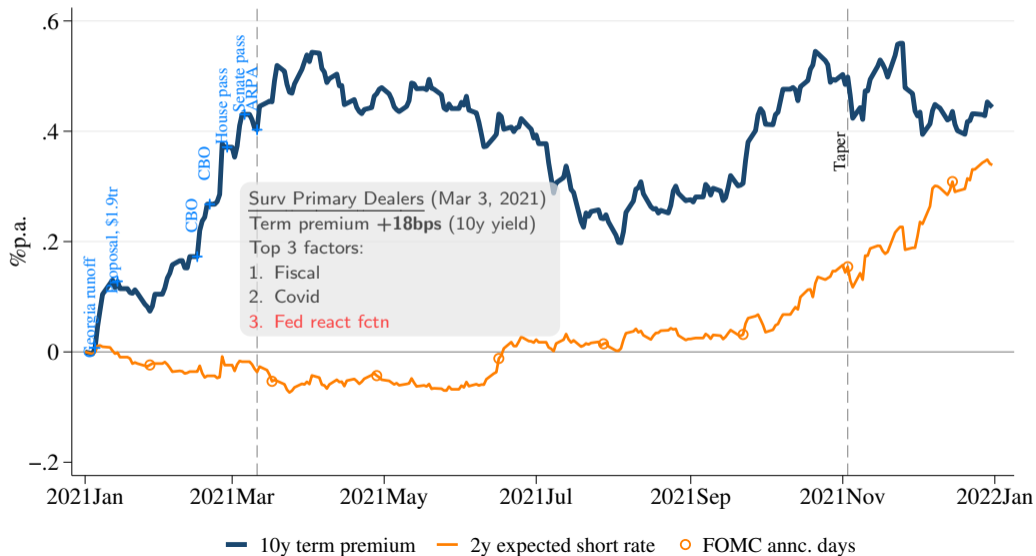
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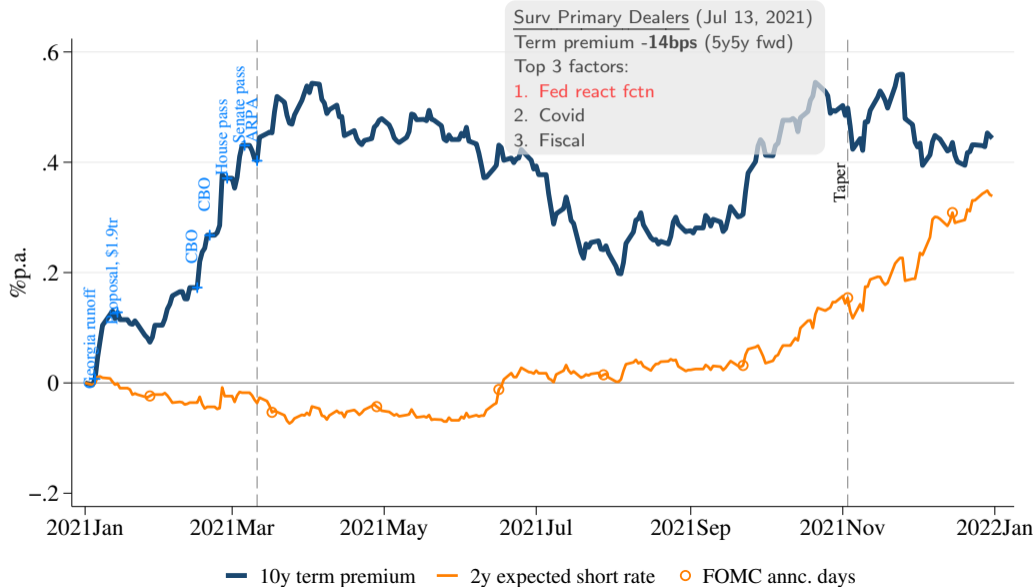
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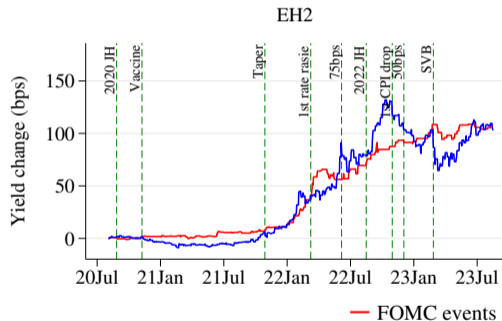


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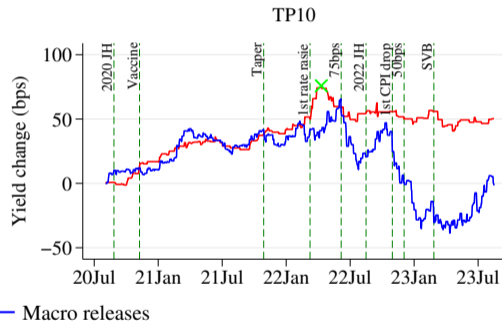


Term premia and short-rate expectations

- ▶ EH2: 2y short-rate expectations stable through late 2021, as Fed intended



- ▶ TP10: 10y term premia cumulatively increased up to 144bps until Jun 14, 2022 (hawkish pivot)



- Fed events: 60bps↑ (peak × 76bps, Apr 19, 2022)
- Macro days: 66bps↑ (peak: 66bps, Jun 14, 2022)

Yield sensitivity to core CPI inflation surprises

Regression of yield changes on core CPI yoy inflation surprises, 2016–2023

	Yields, $\Delta y^{(n)}$		KW decomposition		CP decomposition, $\Delta y^{10}(\text{news}_i)$			
	2y	10y	<i>EH2</i>	<i>TP10</i>	<i>MP</i>	<i>CRP</i>	<i>G</i>	<i>HRP</i>
$D_{16:01,20:02} \times \text{CPICsurp}$	0.098** (2.27)	0.088 (1.60)						
$D_{20:03,20:12} \times \text{CPICsurp}$	0.025* (1.98)	0.13*** (3.95)						
$D_{21:01,22:02} \times \text{CPICsurp}$	0.076* (1.72)	0.13*** (3.59)						
$D_{22:03,23:12} \times \text{CPICsurp}$	0.86*** (4.31)	0.49** (2.14)						
\bar{R}^2	0.41	0.20						
N	96	96						

Dummies: $D_{16:01,20:02}$: pre-Covid; $D_{20:03,20:12}$: Covid shock, early recovery, framework review; $D_{21:01,22:02}$: large inflationary surprises, no rate hikes; $D_{22:03,23:12}$: active rate hikes; constant not shown; robust standard errors; CPICsurp stdev = 0.15pp, max=0.7pp

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$D_{16:01,20:02} \times \text{CPI} \text{Csurp}$	0.098** (2.27)	0.088 (1.60)	0.044** (2.30)	0.054* (1.86)				
$D_{20:03,20:12} \times \text{CPI} \text{Csurp}$	0.025* (1.98)	0.13*** (3.95)	0.014* (1.73)	0.055*** (3.72)				
$D_{21:01,22:02} \times \text{CPI} \text{Csurp}$	0.076* (1.72)	0.13*** (3.59)	0.038* (1.88)	0.057*** (3.35)				
$D_{22:03,23:12} \times \text{CPI} \text{Csurp}$	0.86*** (4.31)	0.49** (2.14)	0.42*** (4.56)	0.22** (2.02)				
\bar{R}^2	0.41	0.20	0.44	0.18				
N	96	96	96	96				

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- ▶ Before policy pivot: increased sensitivity of long yields to inflation surprises via term premium
- ▶ Post-pivot: response via short-rate expectations updates

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$D_{20:03,20:12} \times \text{CPI} \text{Csurp}$	0.025* (1.98)	0.13*** (3.95)	0.014* (1.73)	0.055*** (3.72)	-0.039*** (-4.80)	0.015 (0.45)	0.016 (1.57)	0.14*** (4.54)
$D_{21:01,22:02} \times \text{CPI} \text{Csurp}$	0.076* (1.72)	0.13*** (3.59)	0.038* (1.88)	0.057*** (3.35)	0.015 (1.26)	0.12*** (3.63)	0.0051 (0.30)	-0.012 (-0.83)
$D_{22:03,23:12} \times \text{CPI} \text{Csurp}$	0.86*** (4.31)	0.49** (2.14)	0.42*** (4.56)	0.22** (2.02)	0.34*** (3.74)	0.15 (1.46)	0.092 (1.28)	-0.094 (-0.73)
\bar{R}^2	0.41	0.20	0.44	0.18	0.44	0.095	0.044	0.041
N	96	96	96	96	96	96	96	96

Dummies: $D_{16:01,20:02}$: pre-Covid; $D_{20:03,20:12}$: Covid shock, early recovery, framework review; $D_{21:01,22:02}$: large inflationary surprises, no rate hikes; $D_{22:03,23:12}$: active rate hikes; constant not shown; robust standard errors; CPI Csurp stdev = 0.15pp, max=0.7pp

- ▶ Before policy pivot: increased sensitivity of long yields to inflation surprises via term premium
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A model illustration

- ▶ Fed's asymmetric objective, focus on employment (and inflation) shortfalls, $\lambda_B > \lambda_G$ (Eggertson and Kohn, 2023)

$$E^F[L_t] = E^F \begin{cases} (\pi_t - \pi^*)^2 + \lambda_B(l_t - l^*)^2 & \text{if } l_t \leq l^* \quad \text{(bad times)} \\ (\pi_t - \pi^*)^2 + \lambda_G(l_t - l^*)^2 & \text{if } l_t > l^* \quad \text{(good times)} \end{cases} \quad (1)$$

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- ▶ Phillips curve:

$$\pi_t = E^m[\pi^*] + \kappa(l_t - l^*) + u_t \quad (2)$$

- ▶ IS equation, employment gap:

$$l_t - l^* = -\chi(i_{t'} - E^m[\pi^*] - r^*) + d_t \quad (3)$$

- ▶ Assumptions:

- Fed (F): sets rate $i_{t'}$ before shocks realize, can only respond to shocks d_t, u_t with delay ($t' < t$), doesn't know r^*
- Market (m): doesn't know π^* or parameters λ_B, λ_G

Model: The Fed

- ▶ Loss function asymmetry

$$\lambda_B - \lambda_G > 0$$

- ▶ Fed's optimal policy rate i'_t is

$$\underbrace{i'_t - E^m[\pi^*] - E^F[r^*]}_{\text{Real rate gap}} = \chi^{-1} \left(E^F[d_t] + \frac{\kappa}{\tilde{\kappa}} (E^F[u_t] + (E^m[\pi^*] - \pi^*)) \right) + \underbrace{i'_t}_{\substack{\text{bias} \\ < 0}} \quad (4)$$

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- ▶ Policy is dovishly biased

$$i'_{t'}^{\text{bias}} = -(\lambda_B - \lambda_G) \cdot f(\Sigma, \Theta) + \dots \quad (5)$$

where $\Sigma =$ Fed's uncertainty in forecasting r^* and demand shocks d

- ▶ **Policy bias:** The greater the Fed's uncertainty, the more expansionary bias is required to reduce likelihood of a shortfall \rightarrow inflationary bias

- ▶ Market doesn't know λ_B and λ_G :

$$\lambda_B, \lambda_G \sim \begin{cases} \lambda_B - \lambda_G = 2\Delta & \text{w.p. } p_t \quad (\text{very dovish}) \\ \lambda_B - \lambda_G = \Delta & \text{w.p. } (1 - p_t) \quad (\text{dovish}) \end{cases}$$

where $\Delta > 0$, $p_t < 0.5$, and $0.5(\lambda_B + \lambda_G) = \lambda$

- ▶ Market-perceived policy surprise, $\epsilon_{i,t'}^m = i_{t'} - E^m[i_{t'}]$

$$\epsilon_i^m = g(r^* - E^F[r^*], \pi^* - E^m[\pi^*], \lambda_{BG} - E^m[\lambda_{BG}]) \quad (6)$$

- ▶ *Fed-induced uncertainty* stemming from volatility of these components

$$V^m(\epsilon_i^m) = h(V^m(\epsilon_{r^*}^F), V^m(\epsilon_{\pi^*}^m), p_t(1 - p_t)\Delta^2\Sigma^2, \dots) \quad (7)$$

- ▶ Markets dislike employment shortfall surprises $\tilde{l}_t = (l_t - l^*) - E^m(l_t - l^*)$

$$\tilde{l}_t = d_t - \chi \epsilon_{i,t}^m$$

- ▶ Price assets with real log SDF: $sdf_t - E^m[sdf_t] = -\gamma \tilde{l}_t$

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- ▶ Conditional risk premia on stock and nominal bonds (from perspective of t')

$$\begin{aligned} rp_{t'}^{\text{stock}} &= \gamma \left(\sigma_d^2 + \chi^2 V^m[\epsilon_{i,t'}^m] \right) \\ rp_{t'}^{\text{bond}} &= \gamma \left(-\kappa \sigma_d^2 + (1 - \kappa \chi) \chi V^m[\epsilon_{i,t'}^m] \right) \end{aligned} \tag{8}$$

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- ▶ Fed-induced uncertainty about reaction function shows up in risk premia:

$$\frac{\partial V^m[\epsilon_{i,t'}^m]}{\partial p_t} > 0$$

Model: Market

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$$\frac{\partial V^m[\epsilon_{i,t'}^m]}{\partial p_t} > 0$$

- ▶ **Markets can undermine the Fed's desired stance.** A higher perceived probability of *policy mistake* (too dovish) tightens financial conditions against Fed's intentions (2021: "lower for longer")

- ▶ **Important, timely paper:** The Fed's delay contributed significantly to inflation.

My take on yield-inflation disconnect

- ▶ Constraints from framework + forward guidance interacted with the Fed's uncertainty to create *easing bias in policy* (especially H1 2021)
- ▶ Increased *market's uncertainty about the Fed's reaction function* contributed to yield-inflation expectations disconnect → lower sensitivity via term premia (H1 2021+)
- ▶ Post hawkish pivot, *aggressive tightening* lowered inflation expectations → lower sensitivity via endogenous response to policy (2022)

Lessons for the next framework review

- ▶ Monetary policy is *“98% talk and only 2% action”* but *“cost of sending the wrong message can be high”* (Bernanke, 2015)
- ▶ With term premia involved, policymakers’ *“grip on the steering wheel is not as tight as it otherwise might be”* (Stein, 2013)
- ▶ Markets can undermine the Fed’s desired policy when perceiving a policy mistake
- ▶ Communicating that *different-from-current policy* could be implemented, if needed, can reduce policy uncertainty and stabilize long-term rates
- ▶ Risk management continues to be sensible strategy