Monetary Policy Anchored Expectations
An Endogenous Gain Learning Model
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Inflation: Drivers and Dynamics 2022

Federal Reserve Bank of Cleveland’s Center for Inflation Research and the European Central Bank

My talk

1. Quibbles about the motivation:

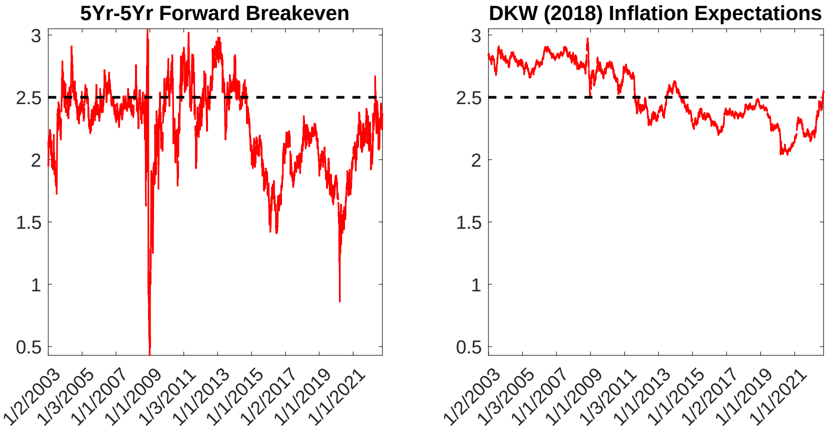
   Do U.S. expectations of long-run inflation move around a lot?

2. Size of the estimated gains does not seem to be in line with micro data (SPF)

3. Large sensitivity of learning gains to contemporaneous forecast errors

   1. How well does the model fit aggregate inflation expectations?
   2. I argue that it takes a sequence of inflation surprises to de-anchor expectations
   3. Such large sensitivity can affect central bank's optimal behavior

Do expectations of long-run inflation move around a lot?



Model by D'Amico, Kim, and Wei (2018) applied to data series constructed as in Kim and Wei (2019)

Do expectations of long-run inflation move around a lot?

Breakeven inflation expectations affected by time-varying premia, which explain

1. the huge drop of inflation expectations during recessions (Lehman's selloff)
2. why breakeven inflation expectations move around a lot

This paper

- Construct a NK model with learning
- Gains are time-varying and respond to past forecast errors

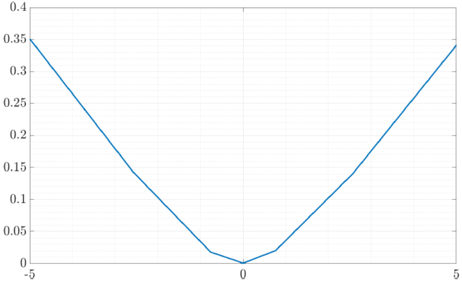
$$k_t = \mathbf{g}\left(fe_{t|t-1}\right)$$

- Large gains correspond to deanchored expectations
- Model is calibrated and some parameters are estimated
- Optimal monetary policy

Estimation of time-varying gains with macro data

$$k_t = \mathbf{g}\left(fe_{t|t-1}\right)$$

Figure 2: Estimated $\hat{\alpha}$: k_t as a function of $fe_{t|t-1}$



Estimates for 5 knots, cross-section of size $N = 1000$, imposing convexity with weight 100000

Estimation of time-varying gains with micro data

Fisher, Melosi, and Rast (2021) Model

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Forecasters form expectations believing inflation follows a **trend-cycle model**:

$$\begin{aligned}
\pi_t &= \rho\pi_{t-1} + (1-\rho)\bar{\pi}_t + \varepsilon_t \\
\varepsilon_t &= \phi\varepsilon_{t-1} + \eta_t, \quad \eta_t \backsim N\left(0, \sigma_\eta^2\right) \\
\bar{\pi}_t &= \bar{\pi}_{t-1} + \lambda_t, \quad \lambda_t \backsim N\left(0, \sigma_\lambda^2\right)
\end{aligned}$$

- π_t is inflation
- $\bar{\pi}_t$ is the drift/trend component
- ε_t is the cyclical component

Forecasters' information set (Fisher, Melosi, and Rast 2021)

- Knowledge of the trend-cycle model
- The history of inflation π^{t-1}
- News

$$y_t(i) = \bar{\pi}_{t+h} + u_t(i), \quad h > 0.$$

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$$y_t(i) = \bar{\pi}_{t+h} + u_t(i), \quad h > 0.$$

Trend component:

$$\bar{\pi}_{t+h} = \bar{\pi}_t + \sum_{j=1}^{h} \lambda_{t+j}$$

Baseline: h=4

Belief component:

$$\begin{aligned} u_t(i) &\equiv v_t + z_t(i) \\ v_t &= \rho_v v_{t-1} + \nu_t, \quad \nu_t \backsim N\left(0, \sigma^2_{\nu,t}\right) \\ z_t(i) &\backsim \mathcal{N}\left(0, \sigma^2_z(i)\right) \end{aligned}$$

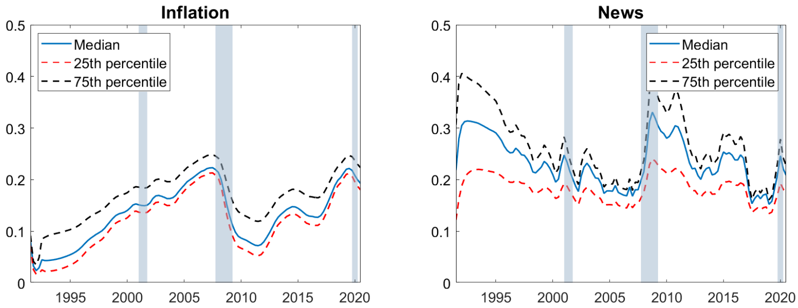
$\Rightarrow$ Forecasters solve a signal-extraction problem Details

Two-step estimation

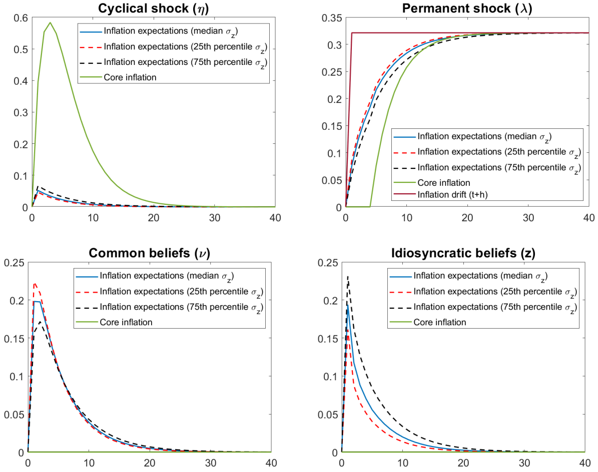
1. **Estimation of trend-cycle model** Model comparison
   - US CPI core inflation
   - Sample: 1959Q1-2020Q4

2. **Panel estimation of forecasters' signal-extraction model** given the estimated trend-cycle model from Step 1 Details
   - US CPI core inflation
   - estimated inflation drift from Step 1
   - individual 10Y SPF CPI inflation expectations up to 2010q4
   - individual 2Y8Y SPF CPI inflation expectations from 2011q1 Details
   - Sample: 1991Q4-2020Q4

Gains estimated with micro data (Fisher, Melosi, and Rast 2021)



Impulse response of inflation expectations (Fisher et al. 2021)



Comments on the Optimal Policy

- Model's prediction: a 1 p.p. positive forecast error increasing long-run expectations by 0.0877 pp translates to raising the interest rate by 8.77 pp

$\rightarrow$ Maintaining inflation expectations anchored is crucial for central banks

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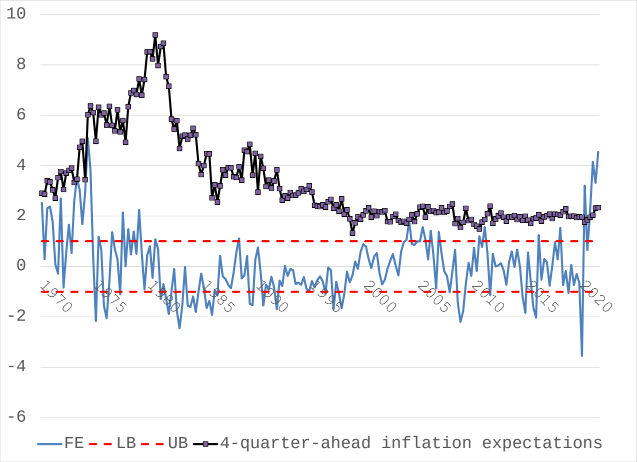
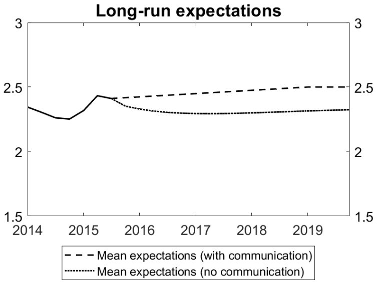
$\rightarrow$ Maintaining inflation expectations anchored is crucial for central banks

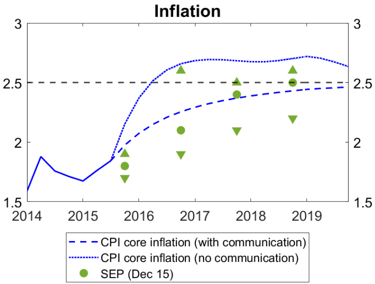
- What worries me a bit more is that the central bank wants to quash immediately any moderate rise in surprise inflation to prevent deanchoring
- I get that central banks do not want to fall behind the curve but, for instance, in the 1970s inflation expectations became unhinged only slowly
- Let's take a look at the data

Forecast errors and inflation expectations



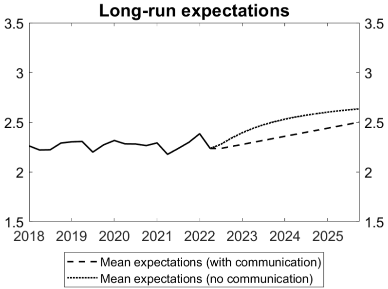
Re-anchoring US inflation expectations: December 2015

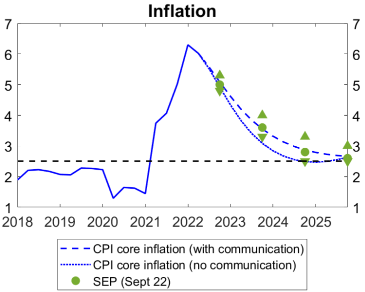




- Perfect communication: the median SEP leads to re-anchoring
- Imperfect communication: an inflation overshoot is needed!

Are September 2022 SEP consistent with re-anchoring?





- With appropriate communications, median SEP consistent with anchoring
- No communication requires inflation to fall quicker to achieve anchoring

Concluding remarks

- This is a very interesting and insightful paper about an important topic
- Break-even expectations do not move much when you control for premia
- I would like to understand why, in the model, gains leading to de-anchoring happen to be so much lower than what one finds when looking at the cross-section of the SPF
- How well does the model match the persistence of expectations in the data?
- I argued that it may take a long sequence of forecast errors to achieve anchoring