Monetary Policy & Anchored Expectations - An Endogenous Gain Learning Model

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1 Unanchored expectations?

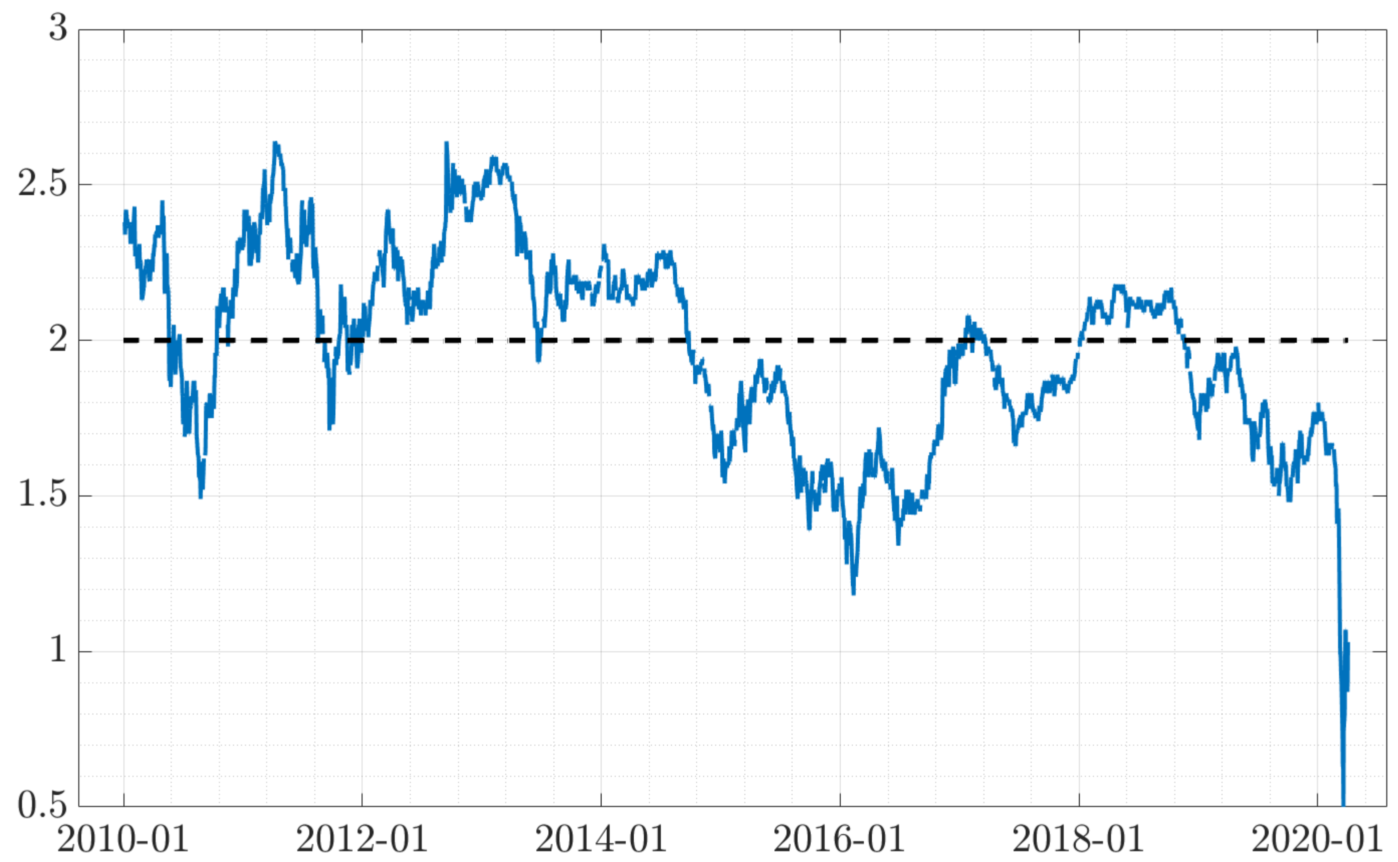

Figure 1: Market-based inflation expectations, 10 year, average (%)

2 Model with anchoring expectation formation

Macro model with Calvo nominal friction: standard up to expectation formation

2.1 Expectation formation

- Model solution under rational expectations (RE)

$$s_t = hs_{t-1} + \epsilon_t \qquad \epsilon_t \sim \mathcal{N}(\mathbf{0}, \Sigma) \tag{1}$$
$$y_t = gs_t \tag{2}$$

- Here: private sector does not know (2) $\rightarrow$ instead postulate

$$y_t = \bar{y} + gs_t \tag{3}$$

- General case: estimate $(\bar{y}, g)$ using (1) & observed states
- Special case: private sector estimates only the long-run mean of inflation:

$$\hat{\mathbb{E}}_t \pi_{t+1} = \bar{\pi}_{t-1} + g_1 h_1 s_t \tag{4}$$

2.2 Anchoring mechanism

Private sector updates estimate of mean inflation using recursive least squares

$$\bar{\pi}_t = \bar{\pi}_{t-1} + k_t \underbrace{\left(\pi_t - (\bar{\pi}_{t-1} + b_1 s_{t-1})\right)}_{\equiv fe_{t|t-1}\text{, forecast error}} \tag{5}$$

Endogenous gain as anchoring mechanism:

$$k_t = k_{t-1} + \mathbf{g}(fe_{t|t-1}) \tag{6}$$

3 Intertemporal tradeoffs under anchoring expectations

Result 1 *Target criterion under anchoring*

$$\pi_t = -\frac{\lambda_x}{\kappa}\Bigg\{ x_t - \frac{(1-\alpha)\beta}{1-\alpha\beta}\Bigg(k_t + ((\pi_t - \bar{\pi}_{t-1} - b_1 s_{t-1}))\mathbf{g}_{\pi,t}\Bigg)$$
$$\Bigg(\mathbb{E}_t \sum_{i=1}^{\infty} x_{t+i} \prod_{j=0}^{i-1} (1 - k_{t+1+j} - (\pi_{t+1+j} - \bar{\pi}_{t+j} - b_1 s_{t+j})\mathbf{g_{\bar{\pi},t+j}})\Bigg)\Bigg\}$$

Result 2 *For any adaptive learning scheme, the discretion and commitment solutions of the Ramsey problem coincide. The solution qualitatively resembles discretion and is thus not subject to the time inconsistency problem.*

4 Quantitative implications for central banking