Unanchoring Regimes under Social Learning

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This Paper

1. **Expectations unanchoring** may arise when the economic environment changes rapidly.
2. **Social Learning (SL)** (Grimaud, Salle, and Vermandel, 2025; Bullard et al., 2026): agents form expectations by imitating the most accurate forecasters
3. **Research Question**: Can social learning explain the observed asymmetry between unanchoring and re-anchoring, and what does it imply for optimal monetary policy?

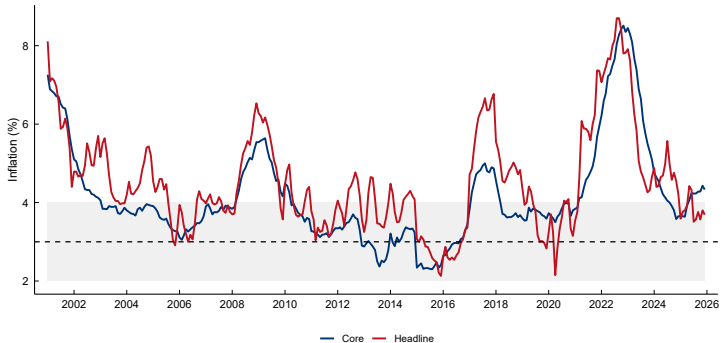
This Paper

1. **Contribution**: a NK model with SL and endogenous regime switching dynamics to analyze optimal policy.
2. Regime switching: agents monitor cumulative forecast errors using a moving sum (MOSUM) statistic.
   - switch to unanchored regime if errors are persistently large
3. Calibration via SMM to match empirical moments of Central Bank of Mexico (Banxico) data.
4. Model replicates the observed asymmetry: unanchoring is gradual while re-anchoring is faster (speed ratio ≈ 0.22).
5. **Policy**: increasing ϕ_π beyond 1.5 reduces unanchoring frequency but reduces welfare.
6. **Intuition**: the CB cannot disentangle fundamental inflation from expectation drift leading to a Brainard-type result.

1. Empirical Motivation

Mexico: Inflation Evolution

- In 2001, the Central Bank of Mexico (Banxico) formally adopted Inflation Targeting as its monetary policy framework after decades of high inflation.



Mexico: Unanchoring Evolution

- Data: Banxico Survey of Professional Forecasters (2013–2025).
- Unanchoring: core-inflation probability mass assigned to target range $[2\%, 4\%]$ over the next two years.



Regime Identification

- Forecast error: $f_t = \mathbb{E}_{t-1}[\pi_t] - \pi_t^{obs}$ (consensus minus realized inflation).
- MOSUM statistic: $S_t = \frac{1}{\hat{\sigma}_f \sqrt{W}} \sum_{j=t-W+1}^{t} f_j$ — are recent f_j systematic or just noise?
- Entry: $|S_t| > \bar{S}$ Exit: $|S_t| < \bar{S}_{exit}$

Related: Carvalho et al., 2023 — firms individually switch between decreasing-gain and constant-gain estimators using a CUSUM-type test (cumulates *all* past errors).

- **My approach**: (i) *social* learning — agents imitate the best forecasters, generating endogenous heterogeneity and disagreement; (ii) MOSUM rolling window — bounded memory enables faster adaptation to regime changes.

Two Families of Learning in Macro

	Bayesian (dec.-gain)	Evolutionary / SL (const.-gain)
What is unknown?	Parameters (β)	Which model is best[†]
How do agents learn?	Bayes rule (prior $\rightarrow$ posterior)	Relative fitness / selection
Gain sequence	$g_t \rightarrow 0$ as $t \rightarrow \infty$[‡]	$g_t = \bar{g} > 0$ for all t
Memory	Full history[‡]	Finite window (ρ)
Convergence	Yes, to RE	No—persistent fluctuations ▸ Eq. concept
Response to shocks	Diminishes over time	Persistent—can trigger regime change
Some papers	Sargent, 1999; Cogley and Sargent, 2005; Primiceri, 2006	Brock and Hommes, 1997; Arifovic, Bullard, and Kostyshyna, 2013

[†] Constant-gain RLS (Orphanides & Williams 2005; Milani 2007) also learns parameters, not models, but shares the gain/memory properties of the right column. [‡] Under drifting parameters (Cogley and Sargent, 2005), Bayesian learning has a positive steady-state Kalman gain and effectively discounts old data.

- **Bayesian**: beliefs converge $\Rightarrow$ transitory shocks have a limited effect on expectations $\Rightarrow$ less suited to generate *recurrent* unanchoring episodes.
- **Evolutionary (SL)**: agents always re-evaluate $\Rightarrow$ a sequence of adverse shocks can shift fitness and trigger regime switches *even if expectations were previously anchored*.

Evidence of Social Learning

- Forecast revision: $FR_{i,t} = \mathbb{E}_{i,t}[\pi] - \mathbb{E}_{i,t-1}[\pi]$ (individual i's update between consecutive surveys).
- Regression: $FR_{i,t} = \beta_0 + \beta_1 \Delta\bar{\mathbb{E}}[\pi] + \text{controls} + \varepsilon_{i,t}$
- $\beta_1 > 0$ and significant in all phases $\Rightarrow$ agents revise toward the consensus.

	Anchored	Unanchoring	Re-anchoring
$\Delta\bar{\mathbb{E}}[\pi]$	0.662^{***}	0.715^{**}	0.609^{***}
	(0.114)	(0.309)	(0.156)
Observations	2,990	568	768

$^{***}p < 0.01$, $^{**}p < 0.05$. Controls: $\Delta\pi^{obs}$, Δi, Δe.

- Agents rely more on consensus as anchoring weakens.

Why MOSUM and Social Learning Together?

- **SL generates the bias**: tournament selection among agents produces an endogenous drift φ_t in expectations, which causes persistent forecast errors.
- **MOSUM detects the bias**: a rolling-window test monitors whether recent forecast errors are systematic or noise. When $|S_t| > \bar{S}$, agents lose trust in the anchor.
- **Feedback loop**: regime switch $\Rightarrow$ lower ω $\Rightarrow$ perceived target $\hat{\tau}_t$ drifts further $\Rightarrow$ larger forecast errors $\Rightarrow$ $|S_t|$ stays elevated.
- **Asymmetry emerges naturally**:
  - *Unanchoring*: a few large errors push $|S_t|$ past $\bar{S}$ quickly.
  - *Re-anchoring*: the rolling window retains past errors + hysteresis band ($\bar{S}_{exit} < \bar{S}$) $\Rightarrow$ sustained evidence needed to restore anchoring.

2. The Model

NK Model with Social Learning

- Standard 3-equation NK (Grimaud, Salle, and Vermandel, 2025; Bullard et al., 2026).
  ▸ Equations
- Extension: FTPL block (Cochrane, 2023) — debt valuation dampens unanchoring (R2: 29.7% → 10.3%).
  ▸ Fiscal Block

$$\hat{i}_t = \rho_i \hat{i}_{t-1} + (1-\rho_i)\left(\phi_\pi \hat{\tau}_t + \phi_y \hat{y}_t\right) + \varepsilon_t^m$$

$$\hat{\tau}_t = \hat{\pi}_t + (1-\omega)\hat{\tau}_{t-1}$$

- $\mathbb{E}_t^*(\cdot) \equiv \mathbb{E}_t^{SL}(\cdot)$: expectations formed via **Social Learning**.
- Perceived target $\hat{\tau}_t$ drifts when agents disagree on long-run inflation.
- $\omega \to 1$: $\hat{\tau}_t \approx \hat{\pi}_t$ (anchored — target resets each period).
- $\omega \to 0$: $\hat{\tau}_t \approx \hat{\tau}_{t-1}$ (unanchored — past drift accumulates).

State-Space Representation

The State-Space Representation or the Actual Law of Motion (ALM) for the system is:

$$\hat{z}_t = P\hat{z}_{t-1} + Q\varepsilon_t, \tag{1}$$

where $\hat{z}_t = [\hat{g}_t, \hat{u}_t, \hat{\hat{i}}_t, \hat{\pi}_t, \hat{y}_t, \hat{\tau}_t]'$, $\varepsilon_t = [\varepsilon_t^g, \varepsilon_t^u, \varepsilon_t^m]'$, and $P_{6\times6}$, $Q_{6\times3}$ are matrices of coefficients. Exogenous processes $\hat{g}_t$ and $\hat{u}_t$ follow AR(1) with persistence ρ_g and ρ_u respectively; the monetary policy shock ε_t^m is i.i.d.

What is Social Learning?

Assumptions:

1. **Internal rationality**: agents internalize that SL beliefs affect macro dynamics.
2. **Steady-state beliefs**: model-consistent effects of shocks and lags are known; agents hold heterogeneous beliefs $a_{j,t}$ about *long-run values*.
3. **Private information**: beliefs are private—agents cannot observe others'.
4. **Random-walk beliefs**: an outside observer treats φ_t as a random walk.

Learning Steps:

- **Mutation**: each agent j receives news $m_{j,t}$ about long-run values with prob. μ.
- **Fitness**: agents evaluate mutations by forecast accuracy over recent history.
- **Tournament**: agents are paired; the more accurate belief is adopted by both.
- Details in Bullard et al., 2026 and Grimaud, Salle, and Vermandel, 2025.

The Learning Variable φ_t

- Assumptions 1–2: agents agree on the model structure but **disagree** on steady-state values.
- This introduces a new **state variable**:

$$\varphi_t \equiv \frac{1}{J}\sum_{j=1}^{J} a_{j,t} \tag{2}$$

- φ_t = average deviation of agents' beliefs from RE. The ALM becomes: $\hat{z}_t = P\hat{z}_{t-1} + Q\varepsilon_t + R\varphi_t$

Key decomposition: SL expectations = RE + learning deviation.

$$\mathbb{E}_t^{SL}(\hat{z}_{t+1}) = \underbrace{\mathbb{E}_t(\hat{z}_{t+1})}_{\text{Rational Expectations}} + (I+P)\varphi_t, \tag{3}$$

- In simulation: φ_t emerges *endogenously* from mutation $\rightarrow$ fitness $\rightarrow$ tournament.
- Analytically (Assumption 4): $\varphi_t \sim$ random walk $\Rightarrow$ closed-form state-space.

MOSUM Regime Switching

- Agents monitor forecast errors via MOSUM statistic:

$$r_t = \begin{cases} U & \text{if } r_{t-1} = A \text{ and } \left| \dfrac{1}{\hat{\sigma}_{f,t}\sqrt{W}} \displaystyle\sum_{j=t-W+1}^{t} f_j \right| > \bar{S}, \\ A & \text{if } r_{t-1} = U \text{ and } \left| \dfrac{1}{\hat{\sigma}_{f,t}\sqrt{W}} \displaystyle\sum_{j=t-W+1}^{t} f_j \right| < \bar{S}_{exit}, \\ r_{t-1} & \text{otherwise.} \end{cases}$$

- Regime determines gain: $\hat{\tau}_t = \hat{\pi}_t + (1 - \omega_{r_t})\hat{\tau}_{t-1}, \quad \omega_{r_t} \in \{\omega_H, \omega_L\}$.

3. Simulation Results

Model Fit: SMM Calibration

Full Calibration

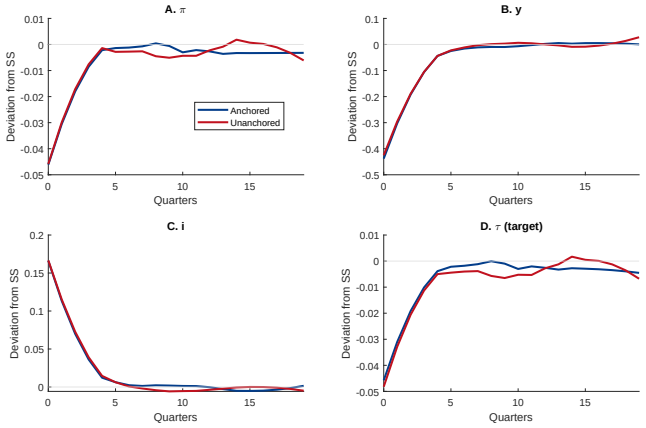
1. **Empirical moments**: apply MOSUM to Banxico survey data for each $(\bar{S}, g, W)$ with $\bar{S}_{exit} = \bar{S} - g$.
2. **Model moments**: simulate SL model with $(\bar{S}, g, \Delta\omega)$, fixed (W, ω_H).
3. **Objective**: 3 parameters, 3 moments (exactly identified):

$$\min_{\bar{S},\, g,\, \Delta\omega} \quad \sum_{i=1}^{3} w_i \left(\frac{m_i^{sim} - m_i^{data}}{|m_i^{data}|} \right)^2, \qquad w = (2,\, 2,\, 3)$$

Moment	Definition	Data	Model	Intuition
Unanchored freq.	$\frac{1}{T} \sum \mathbf{1}[\lvert S_t \rvert > \bar{S}]$	20.9	23.4	How often credibility is lost
Hysteresis shift	$\hat{\beta}_2$ in $\mathbb{E}[\pi] = \beta_0 + \beta_1 \pi + \beta_2 D^{re}$	0.417	0.007	Path dependence in expectation dynamics
Speed ratio	$\lvert \hat{\gamma}_{unanch} \,/\, \hat{\gamma}_{reanch} \rvert$	NA	NA	Unanchoring is faster than re-anchoring

SMM: $\bar{S} = 3.00$, $\bar{S}_{exit} = 1.25$, $W = 8$, $\omega_H = 0.93$, $\omega_L = 0.80$.

IRF: Monetary Policy Shock



- Monetary shocks: modest amplification under unanchored regime.

▸ Appendix: Other IRFs

Asymmetry in Speed Inherent to SL

$$|\mathbb{E}_t[\pi] - \pi^*| = \alpha + \underbrace{\gamma}_{\text{decay rate}} k_t + \delta\, D_t^{re} + \underbrace{\gamma^{int}}_{\text{slope diff.}} k_t\, D_t^{re} + \varepsilon_t, \quad D_t^{re} = \mathbf{1}[\text{re-anchoring}]$$

$$\text{Speed ratio} = \frac{|\hat{\gamma}|}{|\hat{\gamma} + \hat{\gamma}^{int}|}$$

	Rational Expectations	Bounded Rationality Gabaix, 2020	Diagnostic Expect. L'Huillier, Singh, and Yoo, 2024	Social Learning Grimaud, Salle, and Vermandel, 2025
Panel A: How Expectations are Formed?				
	$\mathbb{E}_t[\pi_{t+1}]$	$\mathbb{E}_t^{BR}[\pi_{t+1}] = \bar{m}\,\mathbb{E}_t[\pi_{t+1}]$	$\mathbb{E}_t^{\theta}[\pi_{t+1}] = \mathbb{E}_t[\pi_{t+1}] + \theta\left[\mathbb{E}_t[\pi_{t+1}] - \mathbb{E}_{t-1}[\pi_{t+1}]\right]$	$\mathbb{E}_t^{SL}[\pi_{t+1}] = \mathbb{E}_t[\pi_{t+1}] + R_\pi\,\varphi_t$
Panel B: Regime dynamics				
Regime 2 freq. (%)	0.0	0.0	0.0	29.7
Episodes	0	0	0	11
Mean duration (months)	—	—	—	26.9
Panel C: Expectation persistence (speed ratio)				
$\lvert\hat{\gamma}\rvert \,/\, \lvert\hat{\gamma} + \hat{\gamma}^{int}\rvert$	—	—	—	0.217*
p-value	—	—	—	0.071

$k_t = t - {}^{t}p^{eak}$, where ${}^{t}p^{eak} = \arg\max |S_t|$ within each episode. $k_t < 0$: unanchoring (slope γ); $k_t > 0$: re-anchoring (slope $\gamma + \gamma^{int}$). $^*p < 0.10$.

4. Optimal Policy Rules

Welfare Analysis

$$\mathcal{L} = \mathrm{Var}(\hat{\pi}_t) + \lambda_x \, \mathrm{Var}(\hat{y}_t), \qquad \lambda_x = 0.25$$

Panel A: Optimal ϕ_π under Regime Switching

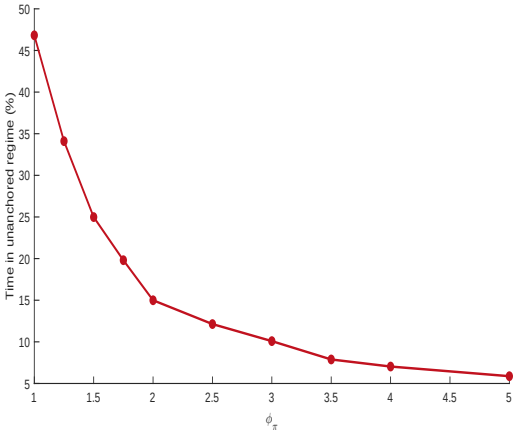
ϕ_π	$\mathcal{L}$	R2 (%)	Episodes
1.00	1.542	46.8	81
1.25	1.087	34.1	100
1.50	**1.022**	**25.0**	**98**
1.75	1.026	19.8	88
2.00	1.067	15.0	76
2.50	1.126	12.1	66
3.00	1.230	10.1	54
3.50	1.307	7.9	47
4.00	1.400	7.0	45
5.00	1.571	5.9	40

Panel B: Welfare Decomposition

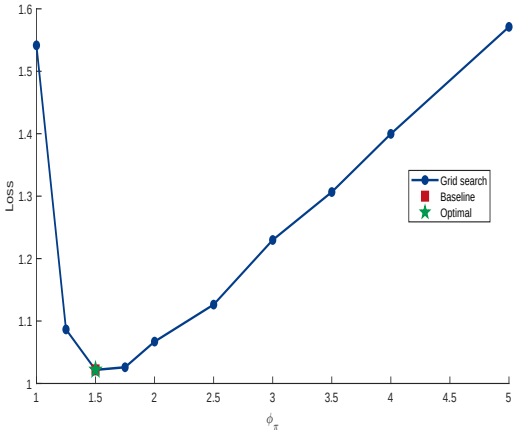
	$\mathcal{L}$	Var(π)	Var(y)	R2 (%)
Perm. Anchored	0.931	0.243	2.754	0.0
Baseline ($\phi_\pi = 1.5$)	0.941	0.228	2.854	18.6
Optimal ($\phi_\pi = 1.50$)	**0.947**	0.231	2.867	18.5

A: Uniform ϕ_π (same in both regimes). **B**: Perm. Anchored ($\bar{S}=100$) vs. Baseline ($\phi_\pi=1.5$). Optimal $\phi_\pi = 1.50$: higher values reduce R2 but amplify Var(y).

Trade-Off: Aggression Reduces Unanchoring but Amplifies Output



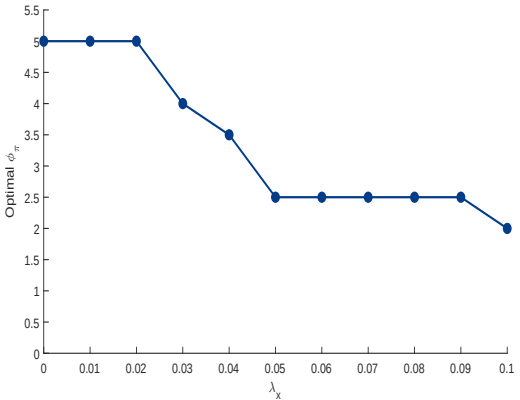
(a) Higher $\phi_\pi \Rightarrow$ less time unanchored



(b) Loss is U-shaped: minimum at $\phi_\pi = 1.50$

- Aggression reduces unanchoring frequency but amplifies Var(y) via the expectation-drift channel $\Rightarrow$ diminishing returns beyond $\phi_\pi = 1.5$.

Sensitivity to λ_x



- $\lambda_x = 0$ (pure inflation targeting): $\phi_\pi^* = 5.0$—maximum aggression.
- As λ_x rises, optimal ϕ_π falls toward 2.0.
- **Why?** Observed π_t = fundamental + drift ($\hat{\tau}_t$). The CB cannot disentangle them (Brainard, 1967).
- Aggressive ϕ_π responds to the *total* signal—but the drift component cannot be corrected by the interest rate. Result: amplified Var(y) with limited re-anchoring.

5. Conclusion

Takeaways

1. **Empirical fact**: Banxico survey data shows that unanchoring is gradual while expectations converge faster per period during re-anchoring (speed ratio ≈ 0.22), with persistent hysteresis in expectations.
2. **Quantitatively**: A NK model with social learning and MOSUM regime switching.
   - Calibration via SMM to match moments of Banxico data.
   - Model replicates the asymmetry in speed and the hysteresis dynamics.
3. **Policy**: The optimal uniform Taylor rule is $\phi_\pi = 1.50$; increasing aggression beyond this reduces unanchoring frequency but amplifies $\text{Var}(y)$, resembling the Brainard, 1967 Principle.

References (i)

- Adam, Klaus and Albert Marcet (2011). **"Internal Rationality, Imperfect Market Knowledge and Asset Prices".** In: *Journal of Economic Theory* 146.3, pp. 1224–1252.
- Arifovic, Jasmina, James Bullard, and Olena Kostyshyna (2013). **"Social Learning and Monetary Policy Rules".** In: *The Economic Journal* 123, pp. 38–76.
- Brainard, William C. (1967). **"Uncertainty and the Effectiveness of Policy".** In: *American Economic Review* 57.2, pp. 411–425.
- Brock, William A. and Cars H. Hommes (1997). **"A Rational Route to Randomness".** In: *Econometrica* 65.5, pp. 1059–1095.
- Bullard, James et al. (2026). **"Soft landing and inflation scares".** In: *Journal of Monetary Economics* 157, p. 103871. ISSN: 0304-3932. DOI: https://doi.org/10.1016/j.jmoneco.2025.103871. URL: https://www.sciencedirect.com/science/article/pii/S0304393225001424.
- Carvalho, Carlos et al. (2023). **"Anchored Inflation Expectations".** In: *American Economic Journal: Macroeconomics* 15.1, pp. 1–47.

References (ii)

- Cochrane, John H. (2023). *The Fiscal Theory of the Price Level*. Princeton, NJ: Princeton University Press.
- Cogley, Timothy and Thomas J. Sargent (2005). **"Drifts and Volatilities: Monetary Policies and Outcomes in the Post WWII US".** In: *Review of Economic Dynamics* 8.2, pp. 262–302.
- Gabaix, Xavier (2020). **"A Behavioral New Keynesian Model".** In: *American Economic Review* 110.8, pp. 2271–2327. DOI: 10.1257/aer.20162005.
- Grimaud, Alex, Isabelle Salle, and Gauthier Vermandel (2025). **"A Dynare toolbox for social learning expectations".** In: *Journal of Economic Dynamics and Control* 172. Special Issue in Honor of Jasmina Arifovic, p. 104984. ISSN: 0165-1889. DOI: https://doi.org/10.1016/j.jedc.2024.104984. URL: https://www.sciencedirect.com/science/article/pii/S0165188924001763.
- L'Huillier, Jean-Paul, Sanjay R. Singh, and Donghoon Yoo (2024). **"Incorporating Diagnostic Expectations into the New Keynesian Framework".** In: *Review of Economic Studies* 91.5, pp. 3013–3046. DOI: 10.1093/restud/rdad101.

References (iii)

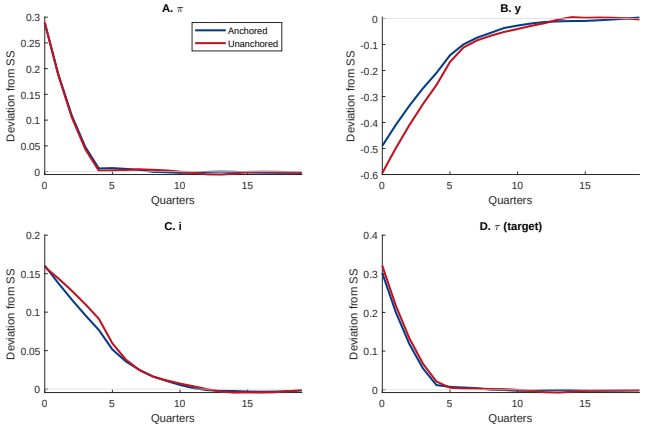

Primiceri, Giorgio E. (2006). **"Why Inflation Rose and Fell: Policy-Makers' Beliefs and U.S. Postwar Stabilization Policy".** In: *Quarterly Journal of Economics* 121.3, pp. 867–901.


Sargent, Thomas J. (1999). *The Conquest of American Inflation*. Princeton University Press.

Part I

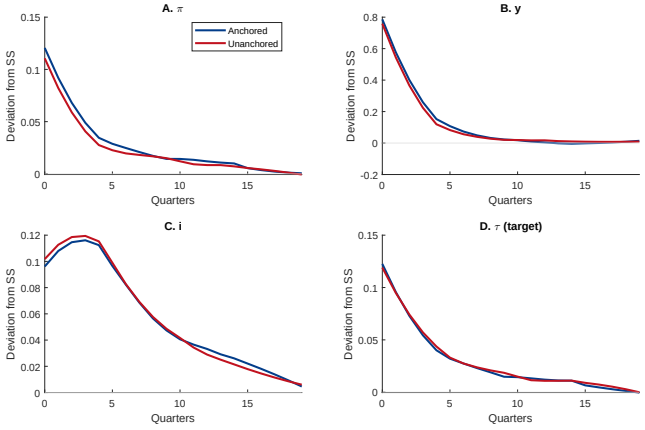
Appendix

IRF: Supply Shock



- Supply shocks amplify the drift in perceived target.

IRF: Demand Shock



- Demand shocks have the largest persistence differential across regimes.

Return

Full Calibration

Parameter	Description	Value	Source
New Keynesian block			
β	Discount factor	0.99	Standard
κ	Phillips curve slope	0.05	GSV (2023)
σ	Inverse EIS	1.00	Log utility
ϕ_π	Taylor rule: inflation	1.50	Taylor (1993)
ϕ_y	Taylor rule: output gap	0.125	Taylor (1993)
ρ_i	Interest rate smoothing	0.70	GSV (2023)
ρ_g	Demand shock persistence	0.80	GSV (2023)
ρ_u	Supply shock persistence	0.50	GSV (2023)
Fiscal block (Cochrane 2023)			
ρ_v	Debt discount factor	0.99	$\approx \beta$
ω_b	Bond maturity structure	0.85	$\approx$ 7-yr avg. maturity
α_f	Surplus feedback to debt	0.20	Cochrane (2023)
$\theta_{s\pi}$	Surplus response to π	0.00	Passive fiscal
θ_{sx}	Surplus response to y	0.00	Passive fiscal
η_s	Fiscal shock persistence	0.50	Cochrane (2023)
Credibility and MOSUM			
ω_H	Anchored credibility	0.90	Joint SMM
ω_L	Unanchored credibility	0.80	Joint SMM ($\Delta\omega = 0.10$)
$\bar{S}$	MOSUM entry threshold	3.00	Joint SMM
$\bar{S}_{exit}$	MOSUM exit threshold	1.50	Joint SMM
W	MOSUM window	12	Joint SMM

◂ Return

NK Model: Equations

- Standard 3-equation NK model (Grimaud, Salle, and Vermandel, 2025; Bullard et al., 2026).

$$\hat{y}_t = \mathbb{E}_t^*(\hat{y}_{t+1}) - \frac{1}{\sigma}\left(\hat{i}_t - \mathbb{E}_t^*(\hat{\pi}_{t+1})\right) + g_t, \tag{4}$$

$$\hat{\pi}_t = \kappa \hat{y}_t + \beta \mathbb{E}_t^* \hat{\pi}_{t+1} + u_t, \tag{5}$$

$$\hat{i}_t = \rho_i \hat{i}_{t-1} + (1-\rho_i)\left(\phi_\pi \hat{\tau}_t + \phi_y \hat{y}_t\right) + \varepsilon_t^m, \tag{6}$$

Fiscal Block (Cochrane, 2023)

- Government debt accumulation:

$$\rho_v \hat{v}_t = (1-\alpha_f)\hat{v}_{t-1} + \omega_b \hat{q}_t - \hat{q}_{t-1} - (1+\theta_{s\pi})\hat{\pi}_t - \theta_{sx}\hat{y}_t - u_{s,t}, \tag{7}$$

- $\hat{v}_t$: real government debt (log-deviation from SS).
- $(1-\alpha_f)\hat{v}_{t-1}$: debt persistence—$\alpha_f > 0$ captures surplus feedback to stabilize debt.
- $\omega_b \hat{q}_t - \hat{q}_{t-1}$: capital gains/losses on long-term bonds; ω_b governs bond maturity structure ($\omega_b = 1$: one-period bonds).
- $-(1+\theta_{s\pi})\hat{\pi}_t - \theta_{sx}\hat{y}_t$: inflation and output erode real debt (automatic stabilizers).
- $u_{s,t}$: exogenous surplus disturbance.

Fiscal Block: Bond Pricing and Surplus Shock

- Bond pricing (expectations hypothesis):

$$\omega_b \mathbb{E}_t^*(\hat{q}_{t+1}) - \hat{q}_t = \hat{i}_t, \tag{8}$$

- Long-term bond price $\hat{q}_t$ adjusts so that the expected return equals the short rate $\hat{i}_t$.
- ω_b controls the duration: higher $\omega_b \Rightarrow$ longer maturity $\Rightarrow$ bond prices more sensitive to expected rates.
- $\mathbb{E}_t^*$: expectations formed under Social Learning, not RE.
- Surplus disturbance:

$$u_{s,t} = \eta_s u_{s,t-1} + \varepsilon_t^s, \tag{9}$$

- AR(1) process with persistence η_s and innovation ε_t^s.
- A negative ε_t^s represents an unexpected fiscal deterioration (deficit shock).

Return

Fiscal Concerns and Credibility: Data

- **Credibility** $= \Pr(\pi_{t+1} \in [2\%, 4\%])$ on longer-horizon (2-year-ahead inflation density forecasts).
- **Deficit**$_{t+1}$: analyst's expected **fiscal balance** (% of GDP) for year $t+1$. Typically negative (deficit).
- **Unanchored**: de-anchoring regimes: Two main episodes: 2017:09–2018:12 and 2021:06–2024:07.

Fiscal Concerns Amplify De-anchoring

Dep. var.: Credibility = $\Pr(\pi_{t+1} \in [2\%, 4\%])$, 2-year horizon.

	(1)	(2)	(3) FE	(4) FE
Deficit_{t+1}	2.87	1.71	3.88***	1.92***
	(2.00)	(1.82)	(0.58)	(0.45)
Unanchored		−0.45		**2.83**
		(8.00)		(3.01)
$\text{Deficit}_{t+1} \times$ Unanch		1.91		**4.06****
		(2.64)		(1.10)
Analyst FE	No	No	Yes	Yes
Obs. / R^2	2,956 / .01	2,956 / .03	2,954 / .37	2,954 / .42

SE clustered by date (FE cols) or analyst × date. $^{***}p < 0.01$, $^{*}p < 0.10$.

- Col. 4 (with analyst FE): the deficit interaction (+2.8pp) is significant at 1%.
- Fiscal deterioration amplifies credibility loss *only* when the monetary anchor is already weakened.

Fiscal Deficit Does Not Predict Regime Switching

$$\mathbf{1}[\text{Unanchored}]_{i,t} = \alpha_i + \beta\, \text{Deficit}_{i,t-1} + \varepsilon_{i,t}$$

	(1) LPM	(2) Probit	(3) Logit
$\text{Deficit}_{i,t-1}$	-0.06^{*}	-0.19^{*}	-0.34^{*}
	(0.03)	(0.11)	(0.19)
Analyst FE	Yes	Yes	Yes
Obs. / R^2	2,910 / .12	2,643	2,643

SE clustered by date. All models include analyst FE. $^{***}p < 0.01$, $^{*}p < 0.10$.

- The 1-month lagged expected deficit does not significantly predict entry into the de-anchoring regime.
- Regime switching is driven by accumulated forecast errors (MOSUM), not by fiscal expectations.
- Fiscal deterioration is an *amplifier*, not a *trigger*.

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Equilibrium Concept under Social Learning

- Under SL, beliefs do not converge to RE $\Rightarrow$ the equilibrium is **not** a Rational Expectations Equilibrium.
- Instead: **Internal Rationality Equilibrium** (Adam and Marcet, 2011) — agents optimize given subjective beliefs; they know the model structure (Assumption 2) but disagree on steady-state values.
- The ALM is consistent with agents' optimization:

$$\hat{z}_t = P\hat{z}_{t-1} + Q\varepsilon_t + R\varphi_t$$

- P, Q coincide with RE; $R\varphi_t$ captures the aggregate belief deviation. If $\varphi_t = 0 \; \forall \, t$, the REE is recovered.
- φ_t fluctuates endogenously (mutation $\rightarrow$ fitness $\rightarrow$ tournament) $\Rightarrow$ the equilibrium is a *stochastic process*, not a fixed point in beliefs.
- **Assumption 4** ($\varphi_t \sim$ random walk): $\varphi_t = \varphi_{t-1} + \eta_t \Rightarrow$ belief deviations are *permanent*. If φ_t were stationary ($|\rho| < 1$), deviations vanish and the REE is recovered. The random walk delivers the closed-form since φ_t enters as a state with $P_\varphi = 1$.

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