

The Perceived Monetary Policy Rule: Identification and Macroeconomic Implications

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Motivation and Research Question

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Research Questions

1. *What are the macroeconomic implications of the perceived rule ($\neq$ actual rule)?*
2. *How do we identify the perceived rule $\phi_{t|t}$?*

Takeaways

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- The Taylor principle holds for **nowcast**- but not **forecast**-based estimates.
- **SP-MSNK model** separates the perceived rule from the actual rule.
 - *The Great Moderation*: managing perception matters.

A Simple Model: Why the Perceived Taylor Rule Matters

Setup:

$$i_t = E_t^P[\pi_{t+1}] + r_t, \quad r_t = \rho_r r_{t-1} + v_t$$

$$i_t = \phi_p \pi_t \quad (\text{perceived})$$

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$$\pi_t = \frac{1}{\phi_f - \rho_r} r_t \quad (\text{requires } \phi_f > 1)$$

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Perceived law of motion (requires $\phi_p > 1$):

$$E_t^P[i_{t+h}] = \phi_p \cdot \frac{\rho_r^h}{\phi_p - \rho_r} r_t \quad \underbrace{=}_{h=0} \frac{\phi_p}{\phi_p - \rho_r} r_t$$

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Actual law of motion:

$$\pi_t = \frac{1}{\phi_f} \left(\underbrace{\frac{\rho_r}{\phi_p - \rho_r} r_t + r_t}_{E_t^P[\pi_{t+1}]} \right)$$

A Simple Model: Takeaways

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3. **Identification:** regressing $E_t^P[i_{t+h}]$ on $E_t^P[\pi_{t+h}]$ recovers ϕ_p , at any h .

$$\frac{E_t^P[i_{t+h}]}{E_t^P[\pi_{t+h}]} = \frac{\phi_p \cdot \frac{\rho_r^h}{\cancel{\phi_p - \rho_r}} r_t}{\frac{\rho_r^h}{\cancel{\phi_p - \rho_r}} r_t} = \phi_p \quad \text{for all } h$$

Identification: Why Interest Rate Forecasts Introduce Bias

Monetary policy rule varies over time:

Kim-Nelson 2006, Coibion-Gorodnichenko 2011, Bianchi 2013

$$i_t = \phi_{\pi,t} \pi_t \Rightarrow \mathbb{E}_t[i_{t+h}] = \overbrace{\mathbb{E}_t[\phi_{\pi,t+h}]}^{\text{perceived rule}} \mathbb{E}_t[\pi_{t+h}] + \overbrace{\text{Cov}_t(\phi_{\pi,t+h}, \pi_{t+h})}^{\text{OVB}}$$

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Non-zero covariance = Monetary Regime Uncertainty (e.g., Markov switching):

$$\mathbf{P} = \begin{array}{cc} \begin{array}{c} \text{Hawk} \\ \text{Dove} \end{array} & \begin{array}{c} \text{Hawk} \\ \text{Dove} \end{array} \\ \left[\begin{array}{cc} p & 1-p \\ 1-p & p \end{array} \right] \end{array}$$

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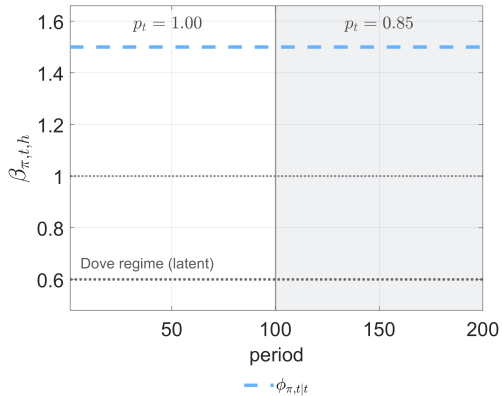
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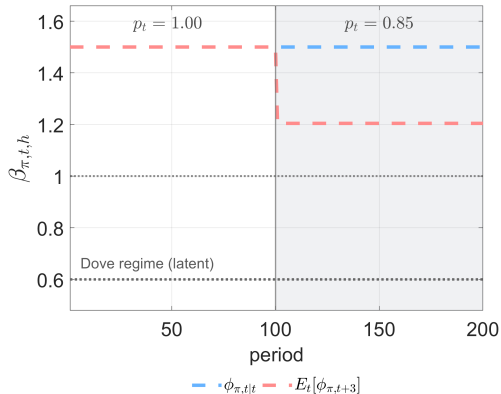
$$\text{Cov}\left(\mathbb{E}_t[\pi_{t+h}], \text{Cov}_t(\phi_{\pi,t+h}, \pi_{t+h})\right) < 0$$

Numerical Illustration - Forecast vs. Nowcast

- Always Hawk: $\phi_{\pi,t|t} = 1.50$.

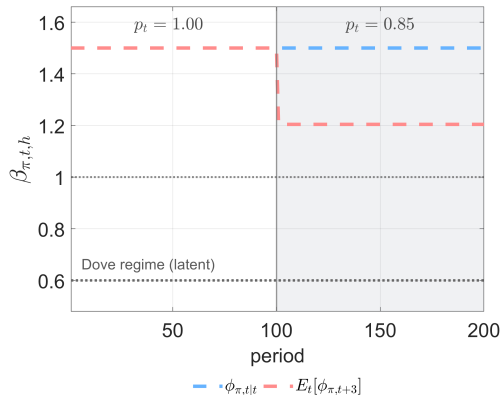


Numerical Illustration - Forecast vs. Nowcast



- Always Hawk: $\phi_{\pi,t|t} = 1.50$.
- But starts to doubt: $\mathbb{E}_t[\phi_{\pi,t+3}] = 1.20$.

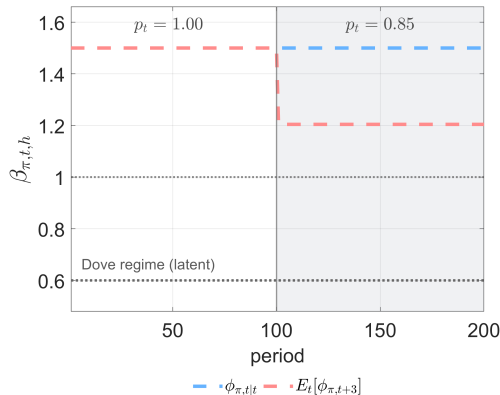
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Survey reports, $t = 1, \dots, 200$:

	$h = 0$		...	$h = 3$	
t	$\mathbb{E}_t[i_t]$	$\mathbb{E}_t[\pi_t]$		$\mathbb{E}_t[i_{t+3}]$	$\mathbb{E}_t[\pi_{t+3}]$
1	4.50	3.00	...	4.35	2.90
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200	3.00	2.00	...	2.40	2.50

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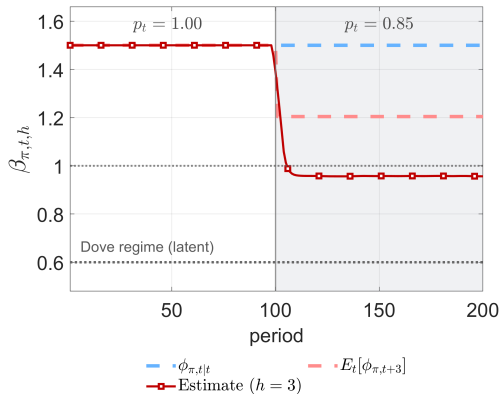
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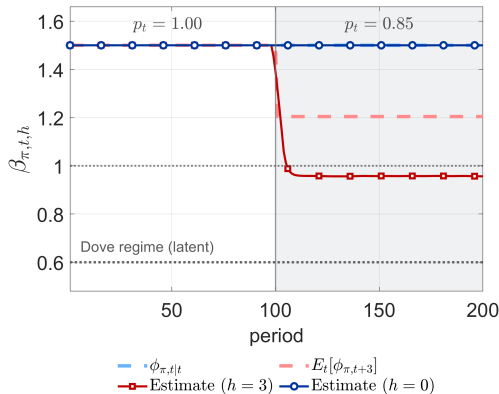
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- **X Forecast ($h = 3$): 0.96**

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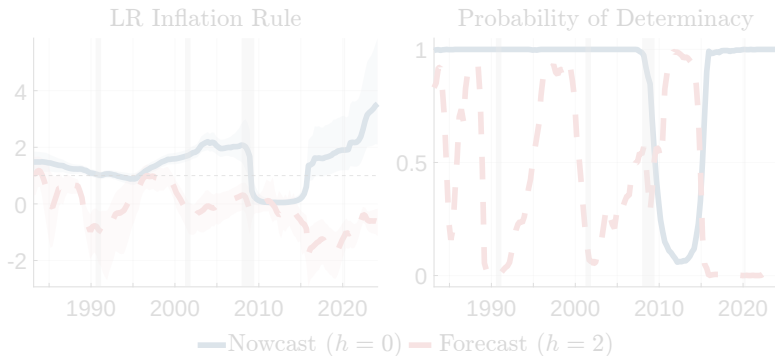
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- **✗ Forecast ($h = 3$): 0.96**
- **✓ Nowcast ($h = 0$): 1.50**

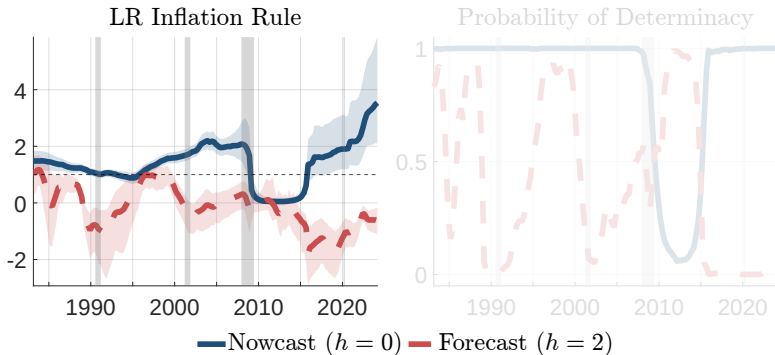
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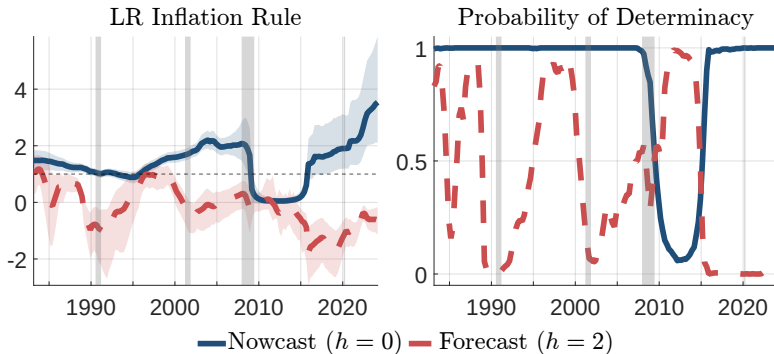
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- **Forecast**-based estimates are **attenuated** and **fail the Taylor principle**.
- **Nowcast**-based estimates are **stable** and **satisfy the Taylor principle**.

Note: Determinacy assessed under the textbook three-equation NK model.

SP-MSNK Model: Setup

Perceived model (Agent's subjective model):

$$x_t = E_t^P[x_{t+1}] - \tau(i_t - E_t^P[\pi_{t+1}]) + z_{Dt}$$

$$\pi_t = \beta E_t^P[\pi_{t+1}] + \kappa x_t + z_{St}$$

$$i_t = (1 - \rho_{s_t^p}^P)[\phi_{\pi, s_t^p}^P E_t^P[\pi_{t+1}] + \phi_{x, s_t^p}^P E_t^P[x_{t+1}]] + \rho_{1, s_t^p}^P i_{t-1} + \rho_{2, s_t^p}^P i_{t-2}$$

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Actual Taylor rule (Fed's true reaction function):

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- Perceived regime s_t^p and the Fed's actual regime s_t^f .
- Subjective transitions $\hat{\mathbf{P}}$ of the perceived regime s_t^p .

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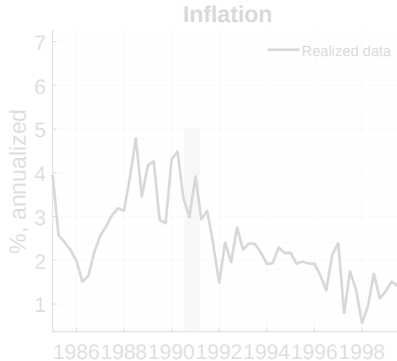
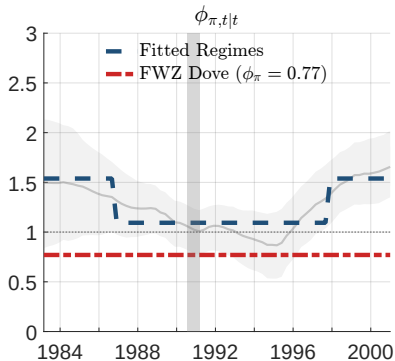
Actual Taylor rule (Fed's true reaction function):

$$i_t = (1 - \rho_{s_t^f}^F) [\phi_{\pi, s_t^f}^F E_t^P[\pi_{t+1}] + \phi_{x, s_t^f}^F E_t^P[x_{t+1}]] + \rho_{1, s_t^f}^F i_{t-1} + \rho_{2, s_t^f}^F i_{t-2} + \varepsilon_{Mt}$$

- Perceived regime s_t^p and the Fed's actual regime s_t^f .
- Subjective transitions $\hat{\mathbf{P}}$ of the perceived regime s_t^p .
- The implied ALM is TV-VAR:

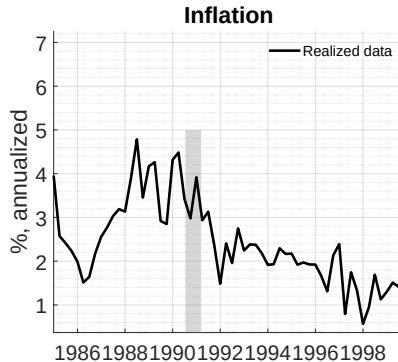
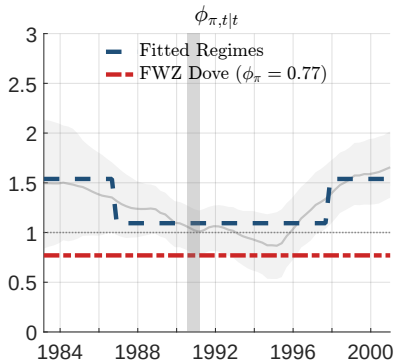
$$\mathbf{y}_t = \mathbf{A}_\ell^{\text{ALM}} \mathbf{y}_{t-1} + \mathbf{B}_\ell^{\text{ALM}} \varepsilon_t, \quad \ell = (s_t^p, s_t^f).$$

Counterfactual: Great Moderation



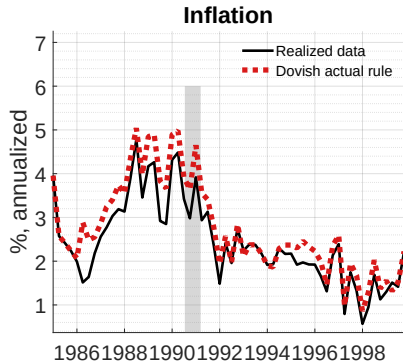
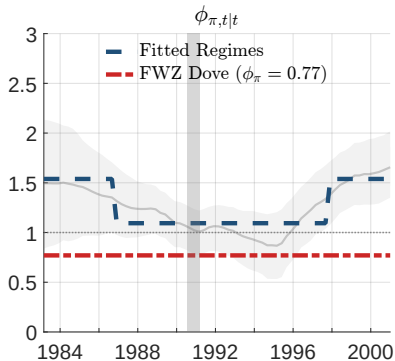
Setup. Discretized perceived rule with a **dovish** pre-Volcker regime ($\phi_p = 0.77$, Farmer et al. 2011).

Counterfactual: Great Moderation



Setup. Discretized perceived rule with a **dovish** pre-Volcker regime ($\phi_p = 0.77$, Farmer et al. 2011).

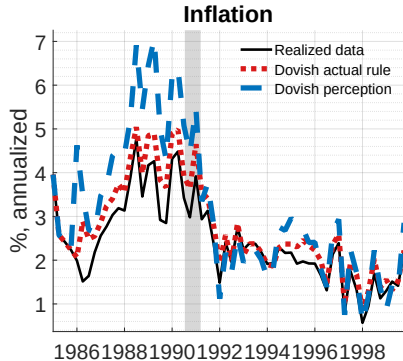
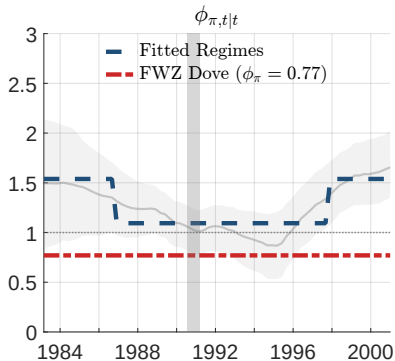
Counterfactual: Great Moderation



Setup. Discretized perceived rule with a **dovish** pre-Volcker regime ($\phi_p = 0.77$, Farmer et al. 2011).

- *Dovish actual rule* (Hawkish perception) $\rightarrow$ modest rise.

Counterfactual: Great Moderation



Setup. Discretized perceived rule with a **dovish** pre-Volcker regime ($\phi_p = 0.77$, Farmer et al. 2011).

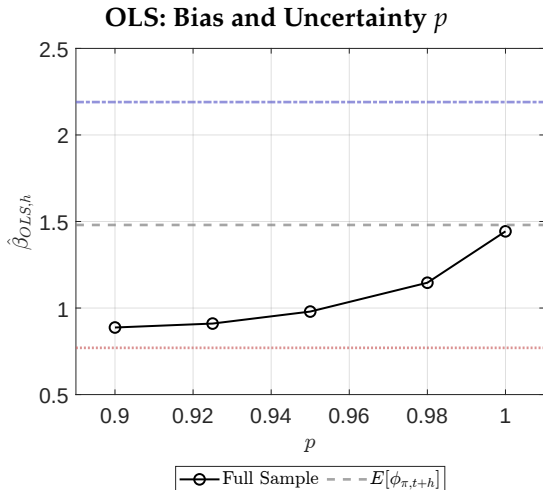
- *Dovish actual rule* (Hawkish perception) → modest rise.
- *Dovish perception* (Hawkish actual) → **larger** increase in level and volatility.

Conclusion. “**Good perceived policy**” underpinned the Great Moderation.

Conclusion

- The **perceived** monetary policy rule governs **macroeconomic dynamics**.
 - Determinacy depends on the perceived Taylor principle.
 - The Great Moderation required a shift in perception, not just the actual rule.
- **Measuring** perception requires interest rate **nowcasts**, not forecasts.
- **Managing** perception is key to effective policy.

Simulation (Backup): OLS Bias and Regime Uncertainty p



- Unconditional OLS on $\mathbb{E}_t[i_{t+h}] = \beta_h \mathbb{E}_t[\pi_{t+h}] + e_{t,h}$.
- Downward bias increases in regime uncertainty p .
- Spurious Taylor-principle violation at the forecast horizon.
- What matters is the agent's uncertainty, not a realised regime shift.