

Modeling Expectations for the Fed's Framework Review

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Disclaimer

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Analytical work for the Fed's Framework Review

- No formal review of our modeling approaches
- Reliance on research expertise across the Federal Reserve System
- Series of 13 memos presented to the FOMC (publicly available)
 - Eclectic use of models: “standard” FRB/US, integrated balance sheet model, HANK, small-scale NK models, ...
- Memo #5: Hebden et al. (2020)
 - Robustness of the performance of makeup strategies to expectation formation
 - Three modelling exercises

Modeling exercise #1

- Makeup strategies like average inflation targeting (AIT) are superior to inflation targeting in theory
 - Expectation channel is crucial: promise of future higher inflation offsets low inflation today
 - strategy and its economic implications need to be understood by the public
- **What if only parts of the public, e.g. financial markets, understand AIT?**
- The FRB/US model consists of several blocks: asset pricing, price/wage setting, consumption, ...
- We can separately model expectations in these blocks
- Result: chart
 - AIT is effective as long as financial markets understand its implications...
 - ...as spending in FRB/US responds to long-term borrowing rates

Modeling exercise #2

- A commitment to overshoot the inflation target could lead to an increase in long-run inflation expectations
- **How do unanchored long-run inflation expectations affect AIT?**
- The FRB/US Phillips curve allows for time-varying expected trend inflation (Cogley and Sbordone, 2008)
 - Long-run inflation expectations are a moving average of past inflation
- Result: [chart](#)
 - Rising inflation expectations necessitate faster tightening...
 - ...and increase the costs of pursuing AIT.

- Spin-off of modeling exercise #3
- Existing literature on the evaluation of makeup strategies
 - either assume perfectly rational expectations
 - or permanent cognitive/behavioral frictions
- Agents may eventually understand the new strategy, but need to learn it from observing policy actions
- **What happens in the transition?**

The Learning Model

- The economy is a system of equations (here: small NK model)
- The central bank follows a policy rule subject to a lower bound

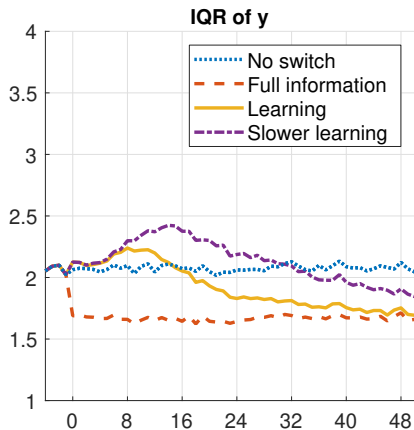
$$i_t = \max \{i_t^*, \underline{i}\}$$

$$i_t^* = \rho_i i_{t-1} + (1 - \rho_i) \left(\pi_t + \phi_{\pi t} \pi_t + \phi_{p t} \frac{p_t}{4} + \phi_y \frac{y_t^{gap}}{4} \right) + e_t$$

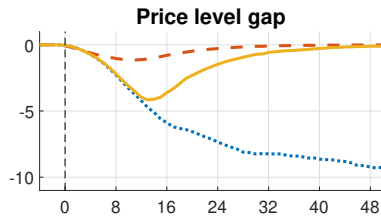
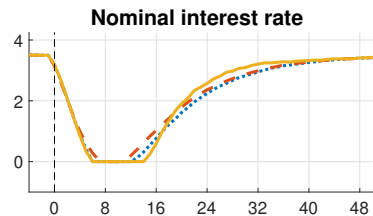
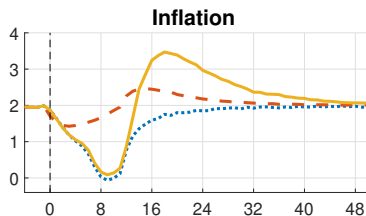
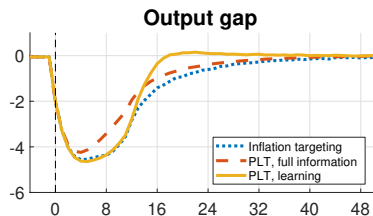
$$p_t = p_{t-1} + \pi_t$$

- Consider a switch from inflation targeting ($\phi_{p t} = 0$) to PLT ($\phi_{\pi t} = 0$)
- Agents observe the policy rate, but not the rule parameters or policy shocks
 - Policymakers can't talk the talk, they've got to walk the walk
- Simultaneously solve for the non-linear Bayesian filtering problem and the equilibrium
 - non-linearity #1: ELB constraint
 - non-linearity #2: loss of information at the ELB

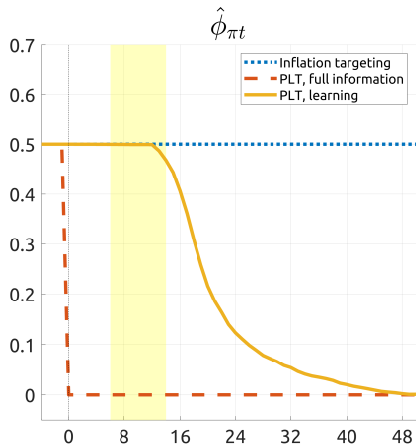
Transition to PLT leads to higher volatility due to learning



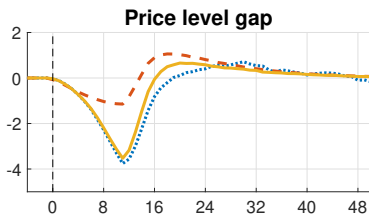
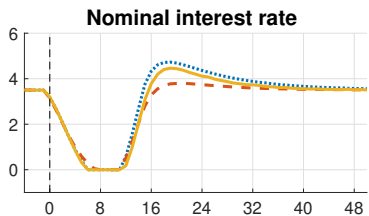
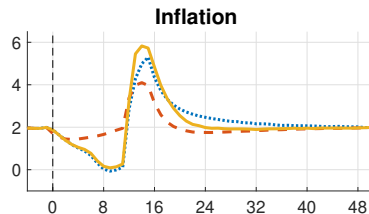
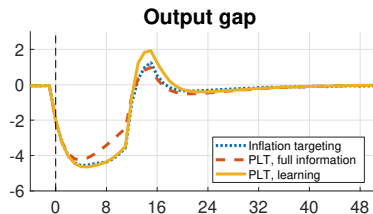
Starting PLT in a recession: no benefits, all costs



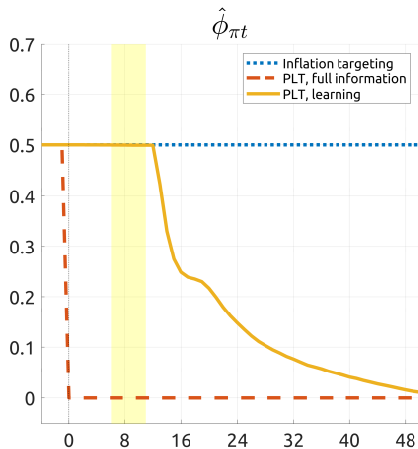
The ZLB makes it hard to learn about a new policy strategy



With learning, PLT cannot contain an inflation surge



An inflation surge after a recession slows down learning

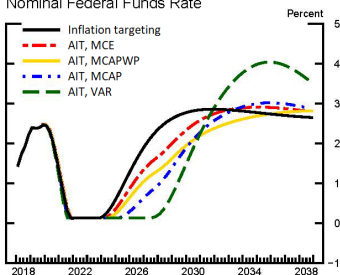


References

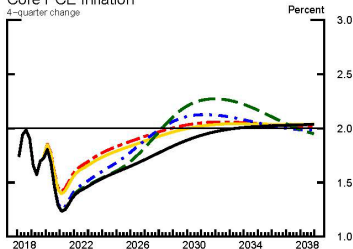
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AIT is effective as long as financial markets understand it

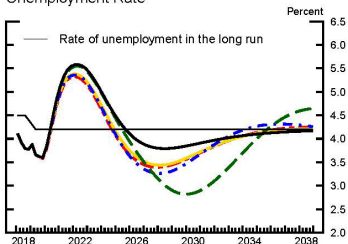
Nominal Federal Funds Rate



Core PCE Inflation

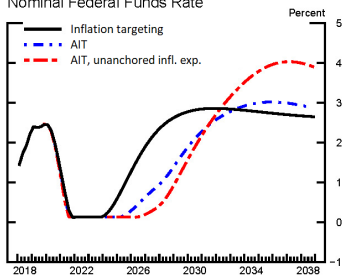


Unemployment Rate

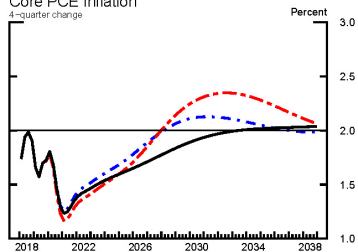


Unmoored inflation expectations are costly for AIT

Nominal Federal Funds Rate



Core PCE Inflation
4-quarter change



Unemployment Rate

