

Panel discussion: Modeling strategies and policy analysis

Joint BoC-BdF-ECB Workshop, Forecasting and Policy Analysis with Semi-Structural Models

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John M. Roberts*
Federal Reserve Board

*The analysis and conclusions set forth are those of the authors and do not indicate concurrence by the Federal Reserve Board or other members of its staff.

Two goals:

1. Discuss role of models in forecasting and policy analysis at the Fed
2. Highlight a recent application in the analysis of monetary policy:
 - Bernanke, Kiley, Roberts (2019) “Monetary Policy Strategies for a Low-Rate Environment”

1. Role of models in forecasting and policy analysis

- Limited role of models in forecasting at the Fed
 - Official staff forecast is judgmental
 - Model does not serve as accounting platform
 - Pure model forecasts are prepared, but they receive little attention

1. Role of models in forecasting and policy analysis, cont'd

- Extensive use of models in policy analysis
- Both semi-structural and DSGE
 - Main domestic model is semi-structural: The FRB/US model that Jean-Philippe discussed earlier today
 - Also maintain a “suite” of DSGE models, some home-grown, others from literature
 - Main international model is calibrated DSGE (Sigma)

Role of models in policy analysis: Examples

- Alternative scenarios
- Alternative policy rules and optimal policy simulations
- “Special projects” for FOMC
- Research papers
 - Kiley and Roberts (BPEA, 2017)
 - Reifschneider (2016)
 - Chung et al. (2019)

2. A recent application in the analysis of monetary policy

Monetary Policy Strategies for a Low-Rate Environment

AER Papers and Proceedings, May 2019

Ben S. Bernanke

Distinguished Fellow, Brookings Institution

Michael T. Kiley*

Federal Reserve Board

John M. Roberts*

Federal Reserve Board

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Motivation

- Low interest-rate environment implies that monetary policy may be constrained by the effective lower bound (ELB) often, leading to a deterioration of economic performance
- Policy proposals to mitigate such a deterioration typically involve commitments to keep rates “lower for longer” (L4L)
- The effectiveness of such approaches depends on their credibility and their ability to affect expectations
- We consider the efficacy of a suite of “lower for longer” approaches under alternative assumptions regarding the effect of policy strategies on the public’s expectations

Preview of main results

- Semistructural model (FRB/US) allows us to examine a situation with a limited ability to manage household and business expectations
 - May be relevant after the announcement of a new policy approach
- We find that limited expectations response reduces--but does not eliminate--the advantages of L4L strategies, so long as financial markets are forward-looking
- Not all lower-for-longer strategies perform well, and certain price-level based policies can perform poorly
- Simple threshold-based approaches perform well

Our approach

Simulations

- Use Fed's FRB/US model
 - Stochastic simulations, imposing the ELB
 - Shocks bootstrapped from those seen over 1970-2015
- Consider two alternative assumptions about expectations formation:
 - “Model-consistent expectations” (**MCE**): Agents are assumed to understand and believe the monetary policy rule
 - “Model-consistent asset pricing” (**MCAP**): Asset prices are determined in a forward-looking manner, but other expectations based on forecasts of a small VAR

Baseline policy approach

- A variant of the **Taylor (1999) rule**

$$i_t = \rho i_{t-1} + (1 - \rho)[r^* + \pi_t + 0.5(\pi_t - \pi^*) + \hat{y}_t]$$

“Lower for longer” strategies I

- **Flexible price-level targeting approaches**

$$i_t = \rho i_{t-1} + (1 - \rho)[r^* + \pi_t + 0.5(\pi_t - \pi^*) + \hat{y}_t + \hat{p}_t]$$

- Adds a **price-level (gap)** term to the baseline rule
- Price-level (gap) enters with same coefficient as output gap (implying rule responds to the nominal income gap)
- Consider variants in which policymakers
 - Respond to price-level during normal and ELB episodes
 - Respond to price-level only during ELB episodes

“Lower for longer” strategies II

- Strategies that base exit from ELB on an **inflation threshold**

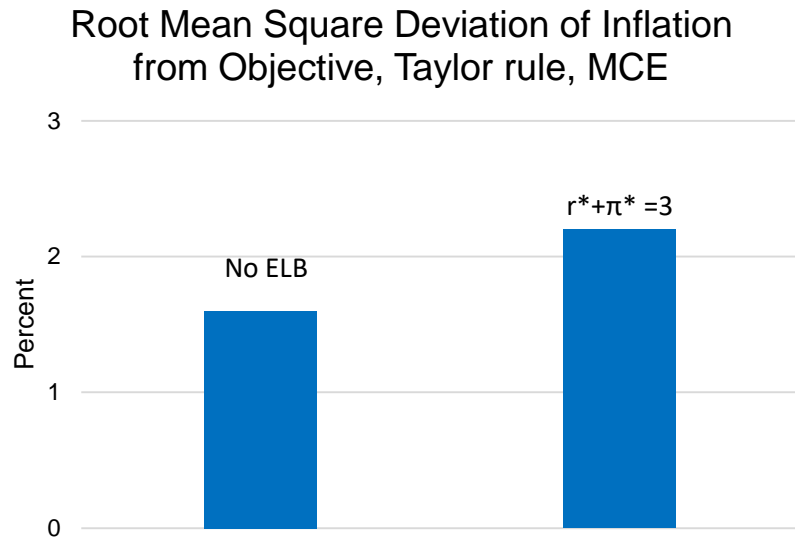
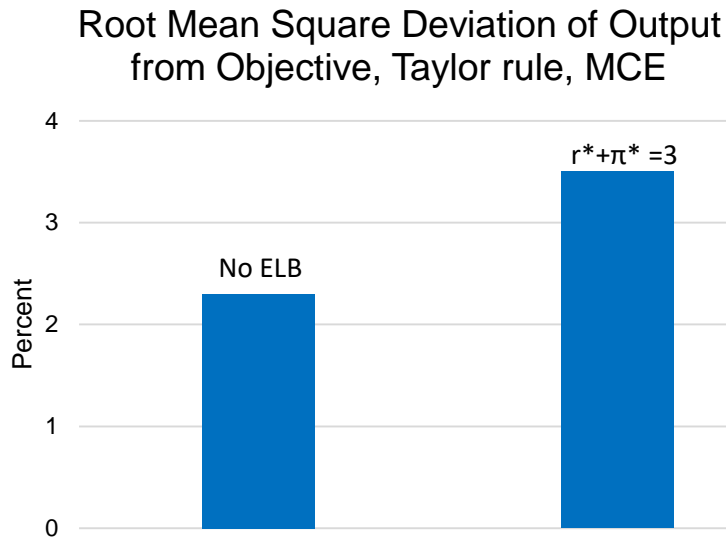
$$i_t = \rho i_{t-1} + (1 - \rho)[r^* + \pi_t + 0.5(\pi_t - \pi^*) + \hat{y}_t]$$

$$\text{only if } \sum_{i=0}^n (\pi_{t-n}^{ELB} - \pi^*) \geq 0$$

- Cases: Inflation gaps accumulated
 - Over entire ELB period---as in temporary PLT proposal of Bernanke (2017)
 - Over most recent three years of ELB period
 - Over most recent year of ELB period (equivalent to an inflation threshold)

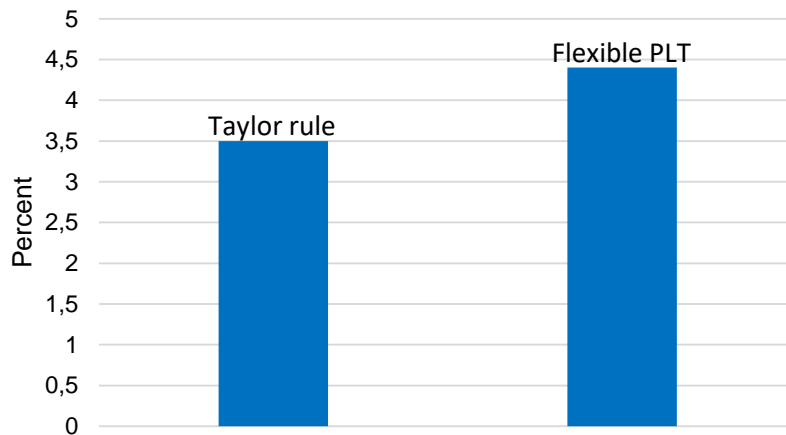
Key results

1. Traditional rules perform poorly when $r^* + \pi^*$ is low

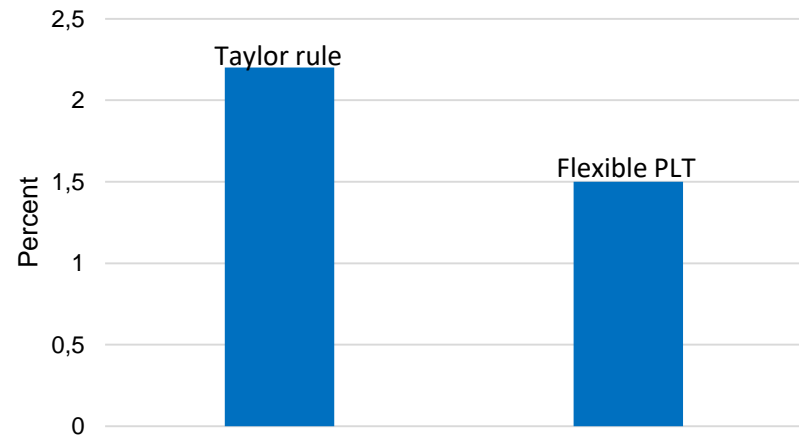


2. Price-level targeting does not perform well in FRB/US, even under MCE

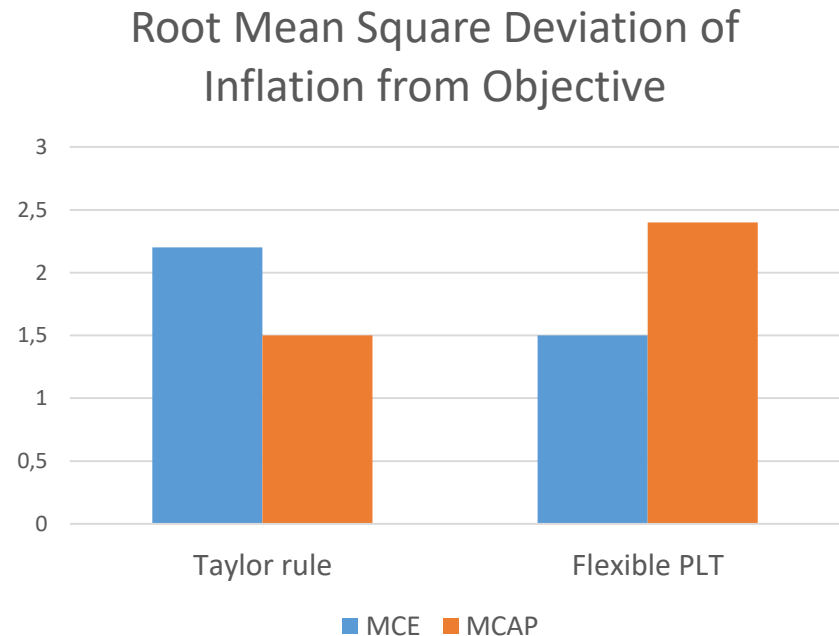
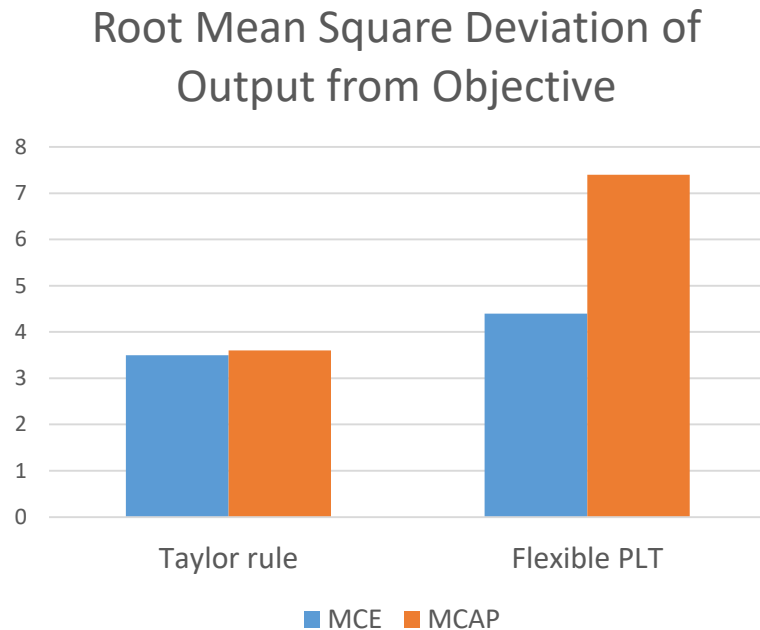
Root Mean Square Deviation of Output from Objective, MCE



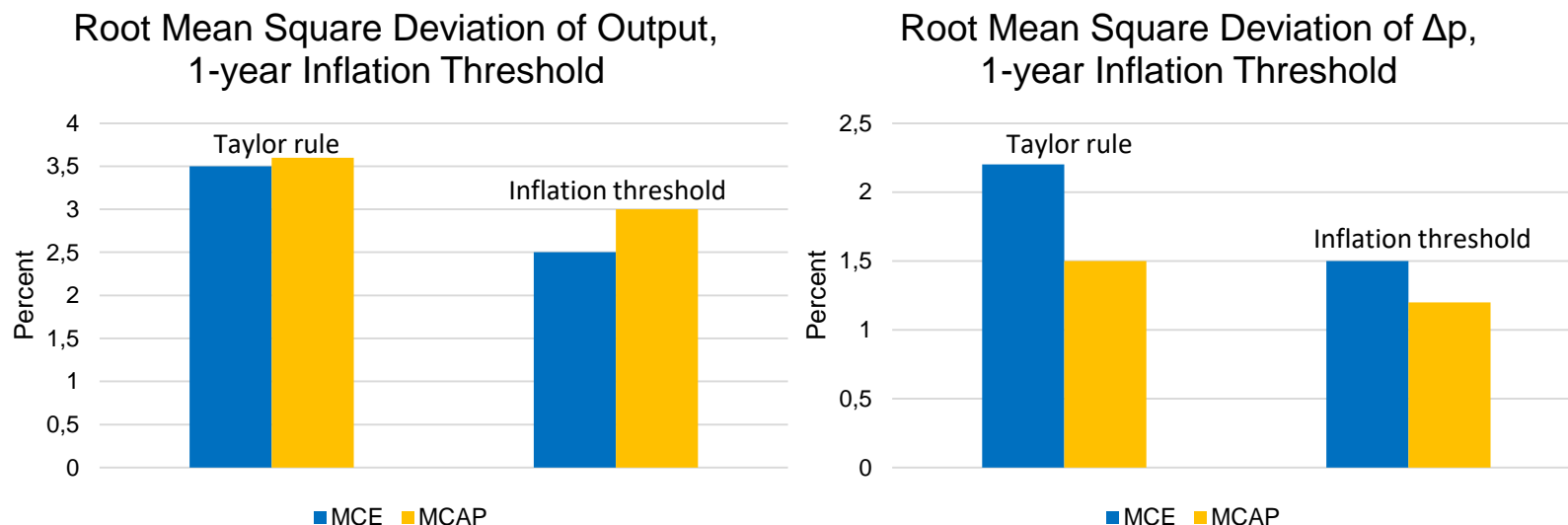
Root Mean Square Deviation of Inflation from Objective, MCE



3. Price-level targeting performs even more poorly in FRB/US when inflation expectations not model-consistent (MCAP)



4. Inflation threshold policy works well



- Threshold approaches also improve performance for longer “look-back” periods under MCE, but by less than a 1-yr look-back
- And longer look-back periods do not improve on Taylor rule under MCAP

Key takeaways

- Semistructural model allows us to assess lower-for-longer strategies when policymakers' ability to manage the public's expectations is limited, assuming expectations in financial markets are responsive to the policy strategy
- Found that some policies worked well even when the ability to manage expectations is limited
- Results point to possible benefits of simple threshold approaches

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