Panel discussion: Modeling strategies and policy analysis

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

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*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

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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*

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

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

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
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
References


