Monetary Policy in a Low Interest Rate World

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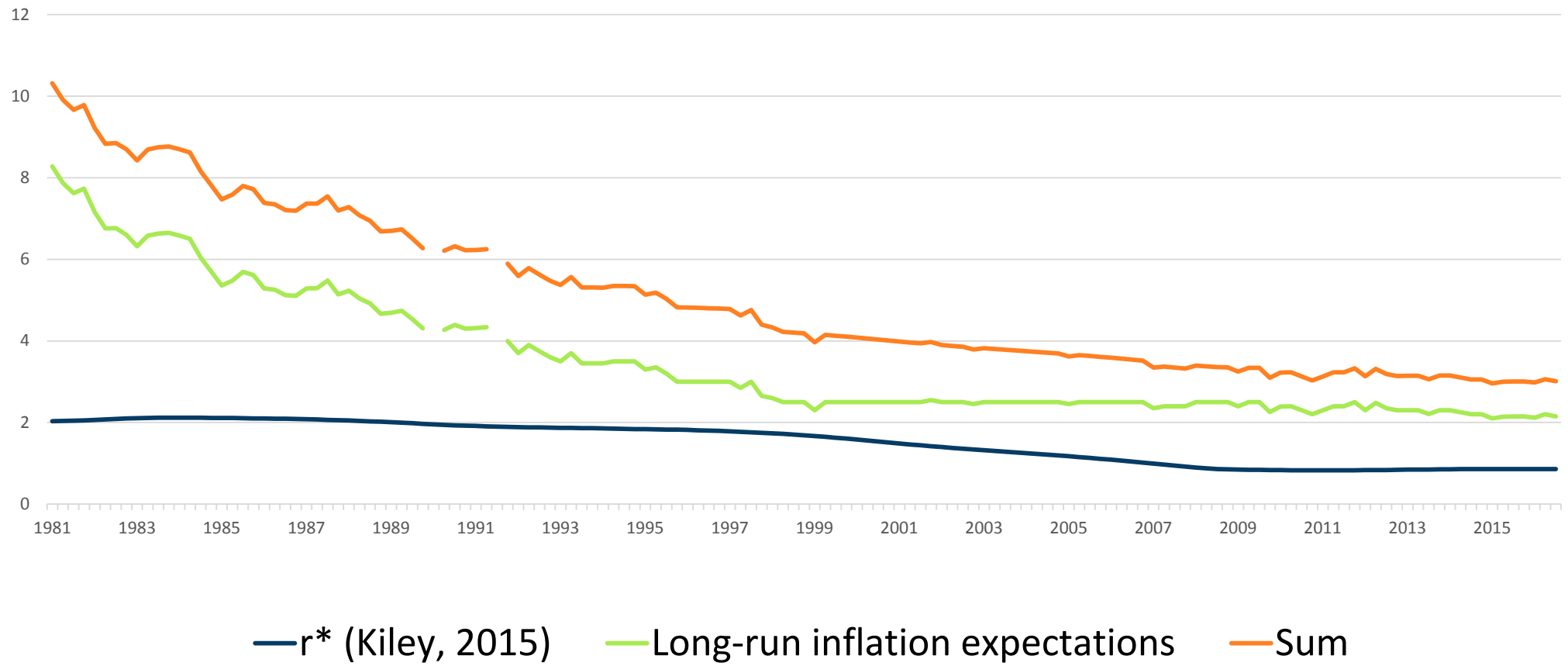
The analysis and conclusions set forth are those of the authors and do not indicate concurrence by the Federal Reserve Board or other members of its staff.

Motivation: Interest rates may stay very low…



The questions we ask

- If r^* is low, how often will the ELB bind?
- What are the resulting consequences for price stability and full employment?
- And how do alternative risk management approaches ameliorate these consequences?

Preview of main results

- Under traditional policy approaches, the ELB may bind much more often than previously estimated
  - This should be expected: Even a mild recession would likely push interest rates to zero, starting from a 3 percent level

- Risk management approaches can ameliorate these consequences

- Findings are broadly similar in a large econometric model (FRB/US) and a dynamic-stochastic-general equilibrium (DSGE) model

How we answer our questions

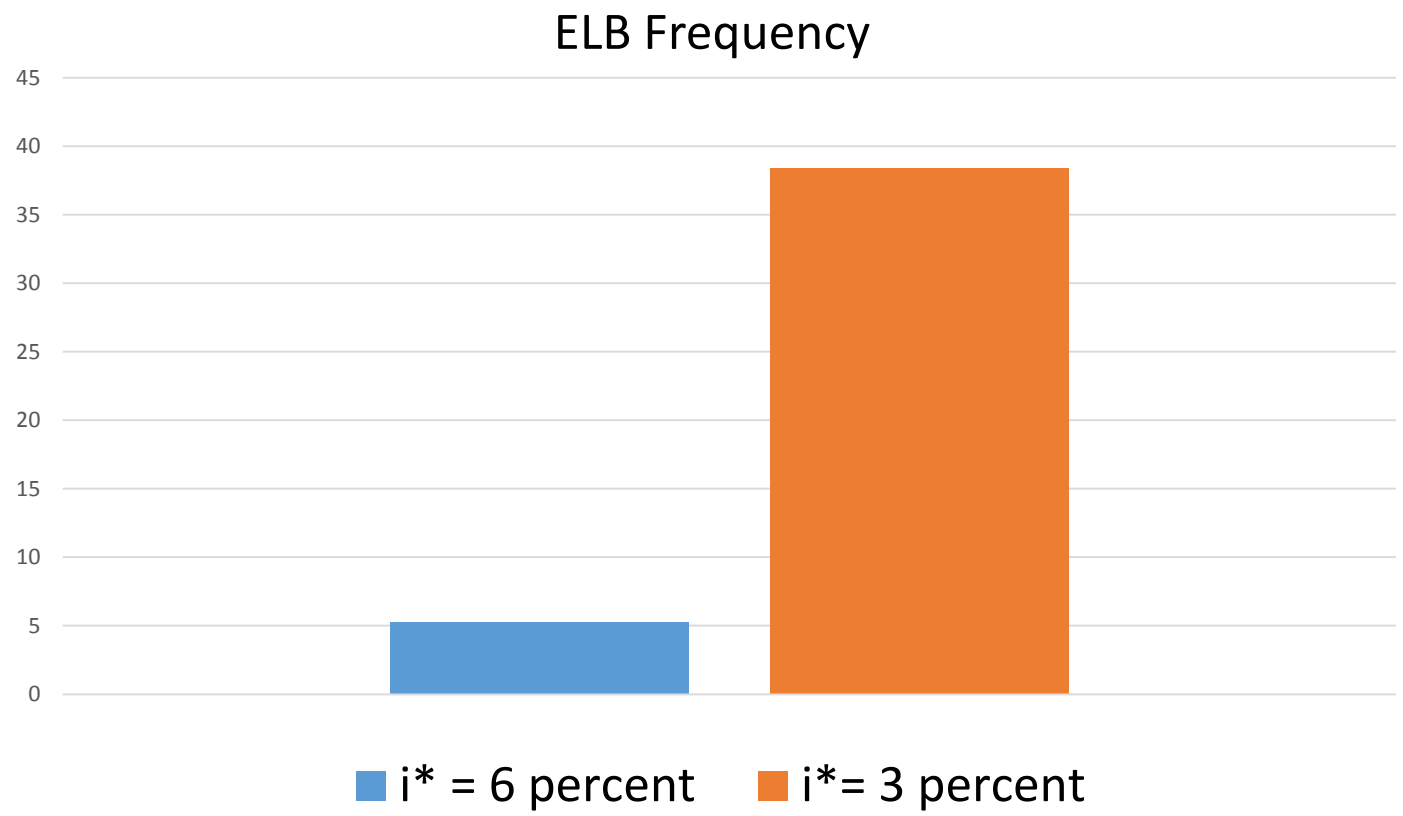
- Use simulations of two models – FRB/US and a current vintage DSGE model (Lindé, Smets, and Wouters, 2016)
  - Research has suggested strategies may be more effective in DSGE models

- Consider the effects of the ELB under alternative assumptions regarding r^* when the inflation target is 2 percent

- Examine alternative policy approaches: Begin with “policy as usual” before the crisis

Results under policy as usual (simple rule)

$$i(t) = r^* + 2 + 1.5(\pi^4(t) - 2) + y(t)$$



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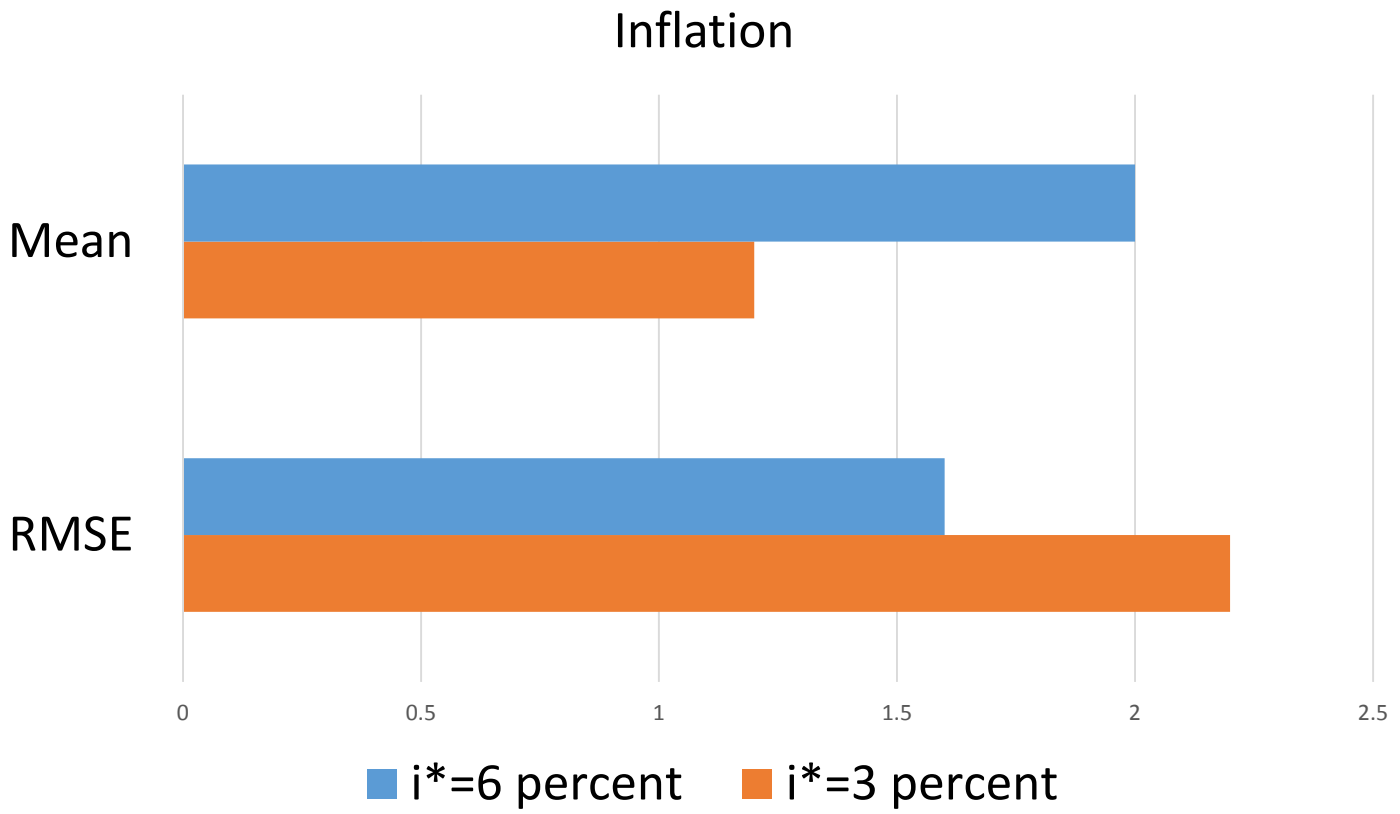

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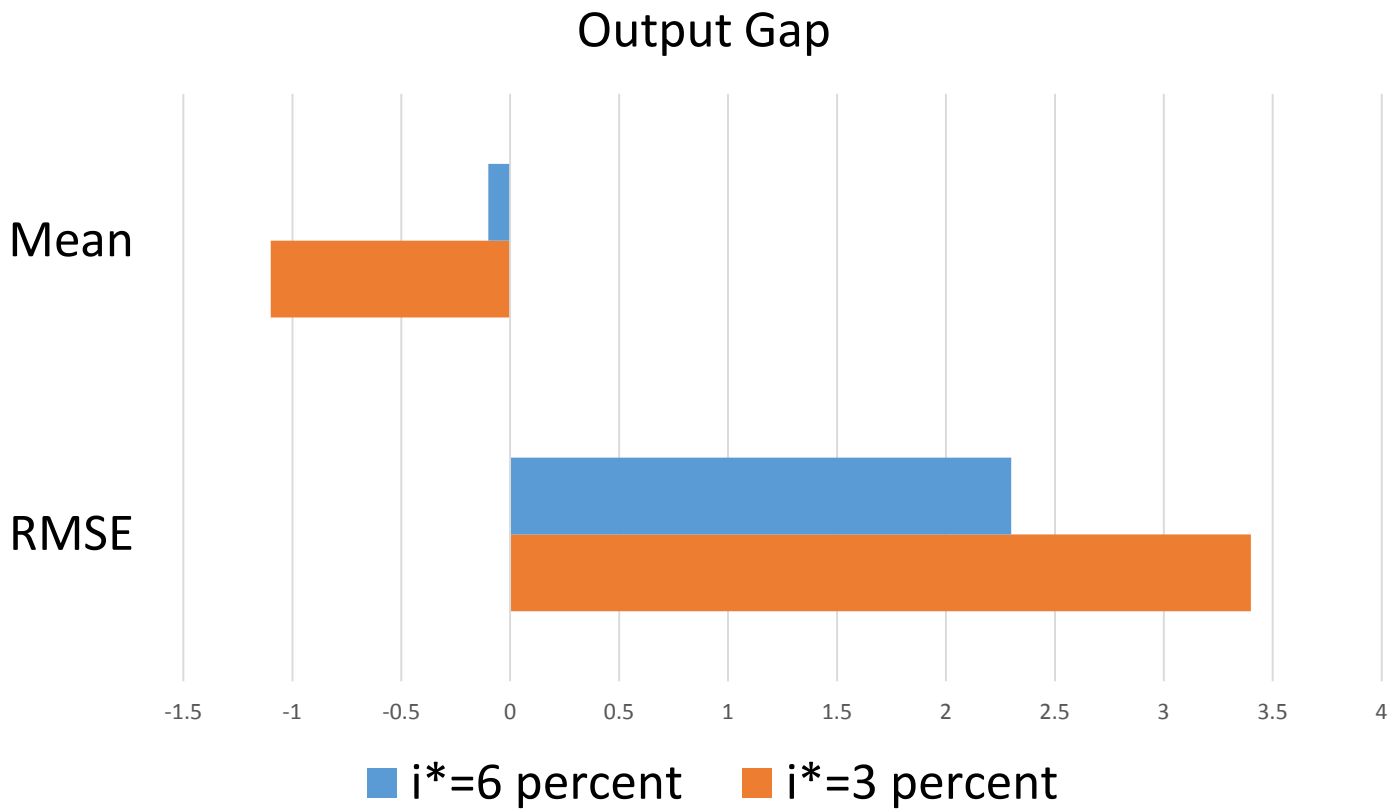
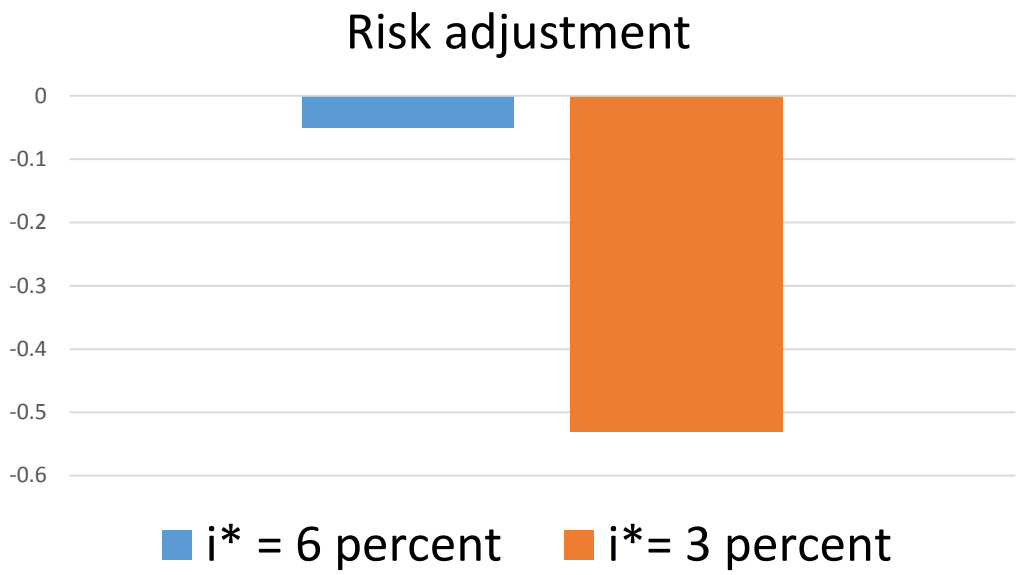
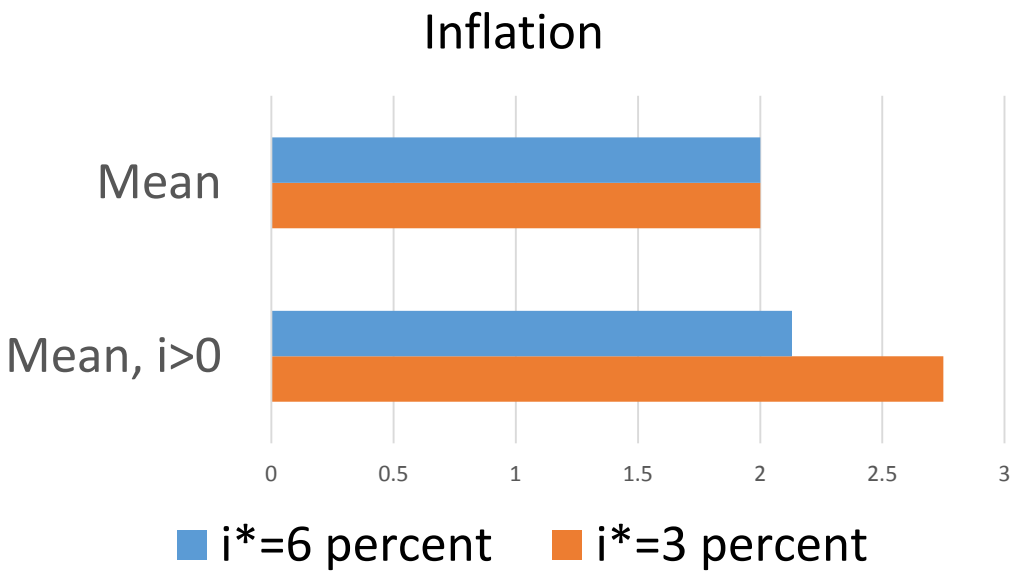


Risk management approach 1: *Risk adjustment*

$$i(t) = r^* - risk\ adjustment + 2 + 1.5(\pi^4(t) - 2) + y(t)$$





Alternative: Raise inflation target

- Suggested in a number of recent pieces (Blanchard et al, 2010; Ball, 2014; and Ball, Gagnon, Honohan, and Krogstrup, 2016)

- Analysis of costs and benefits of a target requires an assessment of the effects on economic performance and a welfare function
  - Our analysis only touches on some of the effects on economic performance

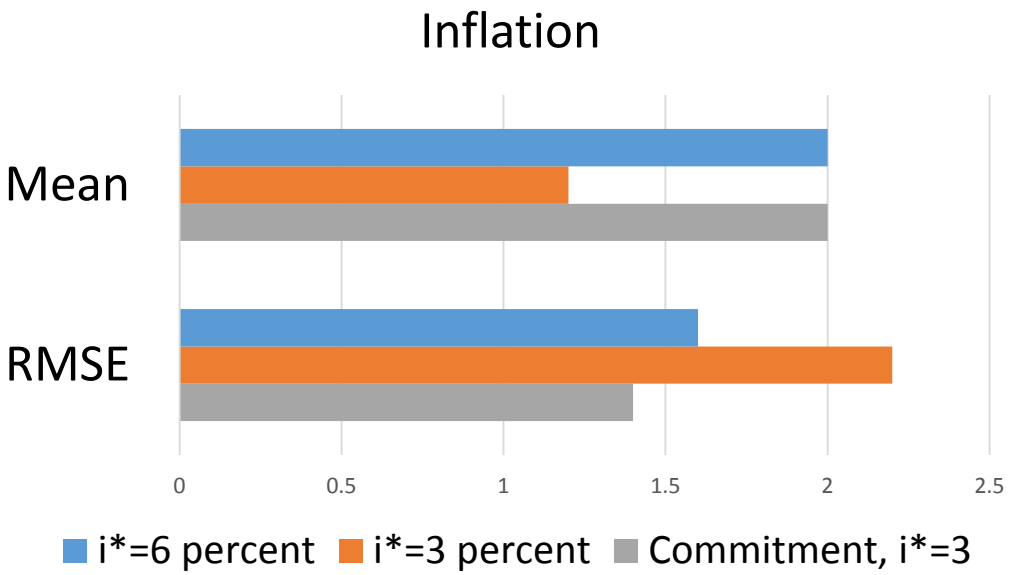
- The related literature needs updating, and a comprehensive assessment of the optimal inflation target is a topic for future work

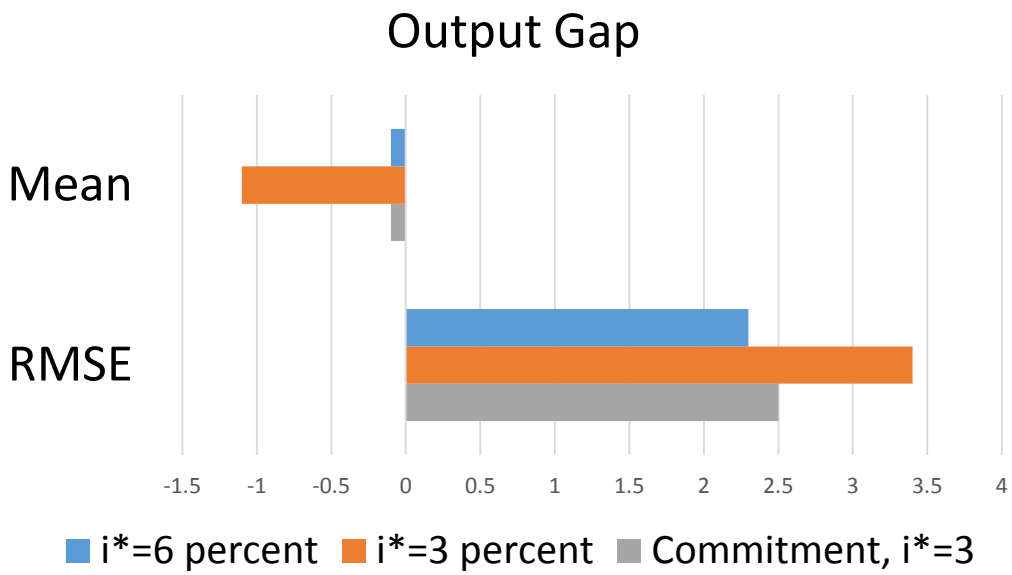
Risk management approach 2: *Commitments*

$$i^*(t) = i^*(t-1) + .125\big(\pi^4(t) - 2 + y(t)\big),$$
$$i(t) = \max[i^*(t), i^{ELB}]$$

- Following ELB episode, $i(t)$ does not lift off zero until inflation or output exceed their objectives, thereby committing to overshooting
- Shadow rate $i^*(t)$ keeps track of accommodation foregone because of the ELB and makes it up (Reifschneider and Williams, 2000)
- The rule is closely related to price-level targeting approaches

Comparison of commitments to policy as usual





A few key points regarding commitments

- Commitments to overshoot work well in FRB/US and the DSGE model
- Both aspects of commitment we consider are important
  - The commitment to not raise rates until inflation or output overshoot
  - And the commitment to make up foregone accommodation associated with *i**
- Concerns about credibility/time-consistency raise important questions about whether commitments would be as efficacious as found in the model simulations

Comparison to earlier work

- ELB is much more likely to bind and the effects on output and inflation are larger than in previous analyses

- Previous FRB/US analyses (Williams, 2009)
  - ELB binds 40% of time in our analysis vs less than 20% in Williams
  - ELB is more binding than in Williams owing to computational improvements

- Previous DSGE work (Coibion, Gorodnichenko, and Wieland, 2012)
  - Their analysis assumes commitments through shadow rates
  - Absent such commitments, performance very poor (as in our analysis)

Wrap up

- The ELB will bind very frequently (40 percent or more) if r^* is 1 percent or lower under a policy-as-usual approach

- Risk management approaches can ameliorate these effects, but require allowing inflation to overshoot objective
  - Such overshooting may undermine credibility of the inflation target

- Commitment/forward-guidance policies are effective in both the FRB/US and DSGE models, assuming credibility