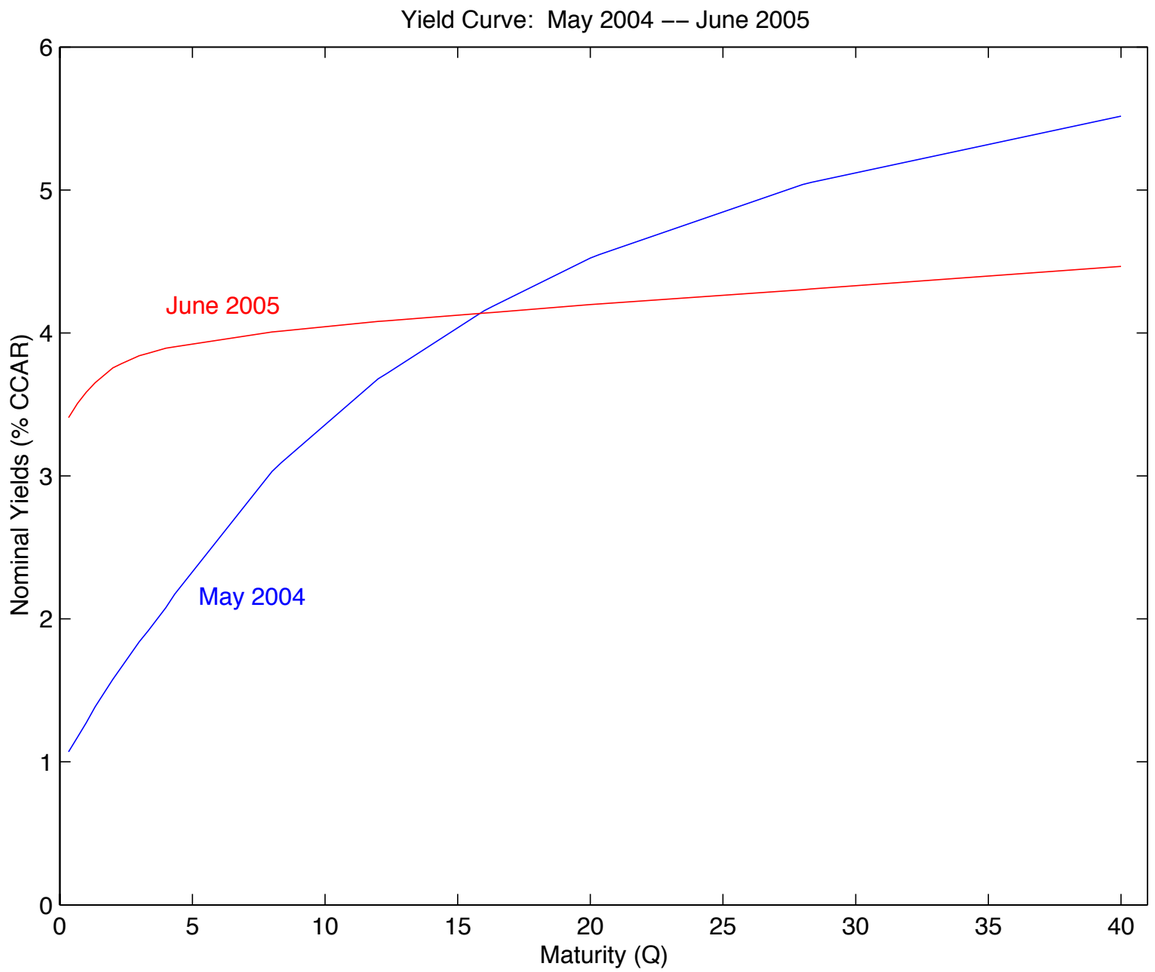
Monetary Policy and the Term Structure of Interest Rates

Burton Hollifield
Tepper School of Business
Carnegie Mellon University

QWAFAFEW-Denver Presentation



Long-term interest rates have trended lower in recent months even as the Federal Reserve has raised the level of the target federal funds rate by 150 basis points. Historically, even distant forward rates have tended to rise in association with monetary policy tightening. ... For the moment, **the broadly unanticipated behavior of world bond markets remains a conundrum.**

–Alan Greenspan, February 2005

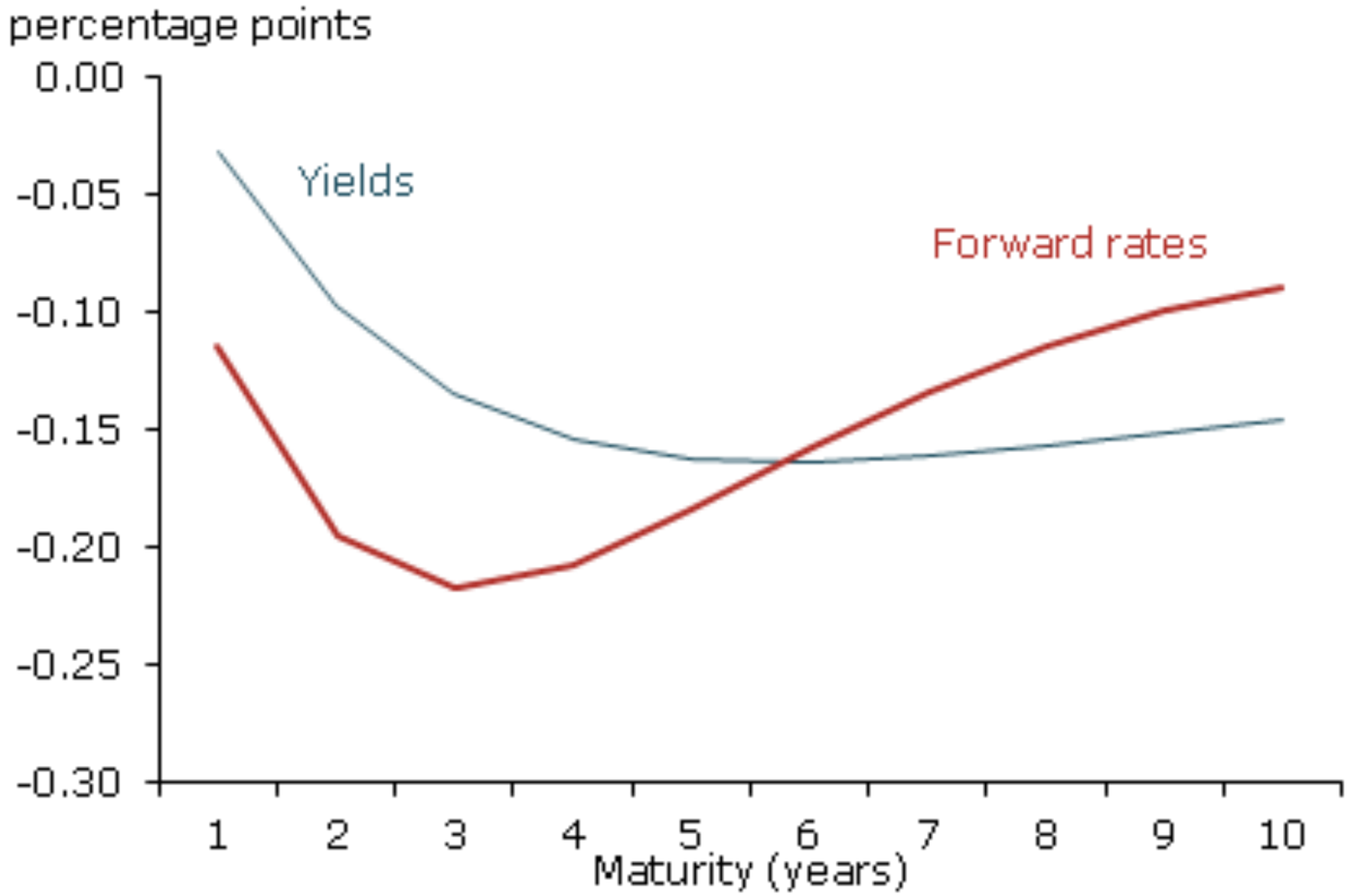
THE WALL STREET JOURNAL.
WSJ.com

March 13, 2012, 3:45 PM ET

Rise in Treasury Yields Greet More Realistic Fed

Yields on U.S. Treasury 10-year notes are at their highest level of the year, albeit still in a remarkably low neighborhood around 2.11%.

Figure 1
Interest rate changes on July 8, 2011



Non-Farm Payroll released, lower than forecasts: Bauer, 2011

How does Fed Policy determine the Term Structure of Rates?

What is Fed policy?

Setting current rates?

Setting a Fed Funds Rate Policy: The Taylor Rule?

QE?

The Taylor Rule

$$i_t = \tau_x \text{Output Gap} + \tau_p \pi \text{ Gap} + \text{policy shock}$$

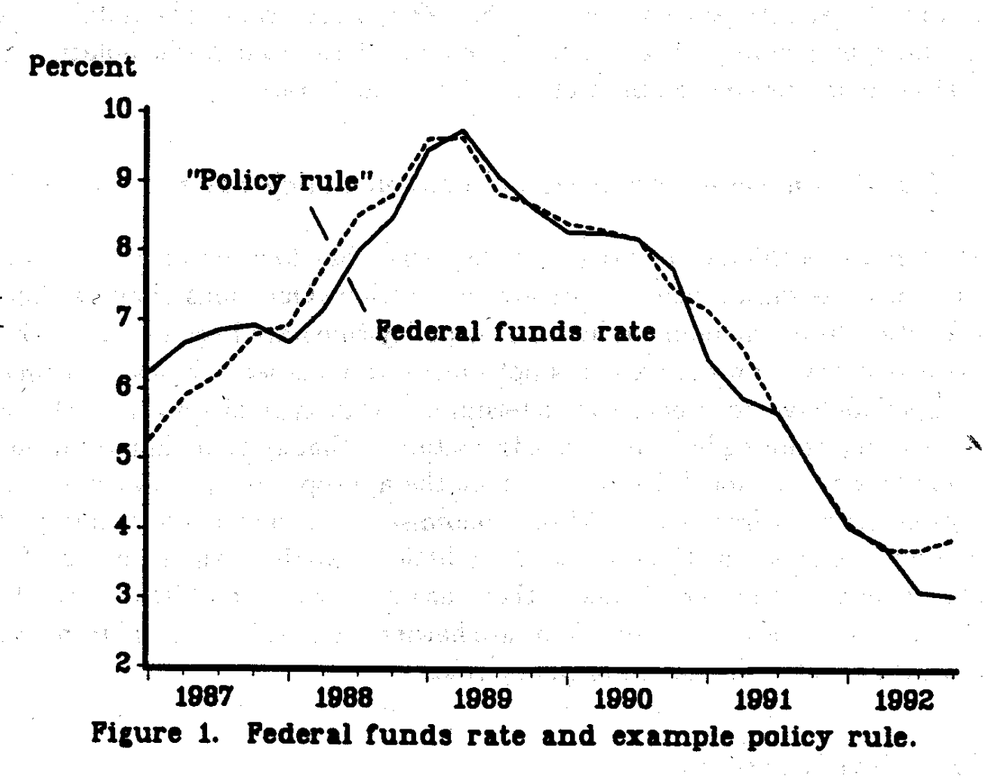


Figure 1. Federal funds rate and example policy rule.

But rates depend on inflation

$$r_{nominal} = r_{real} + \text{ Expected Inflation} + \text{ Inflation Risk}$$

Setting short term rates should help determine inflation and nominal bond returns

Bond returns depend on rate changes

Expected future rates should determine today's term structure

But that is going to depend on future inflation, future gaps, and future policy shocks

What about risk?

How does changes in the Taylor rule change the term structure?

How does it change inflation risk?

How does it change real rates?

How do changes in the Taylor rule can change the dynamics of inflation, the dynamics of inflation risks, the dynamics of bond returns, yields, and yield volatility?

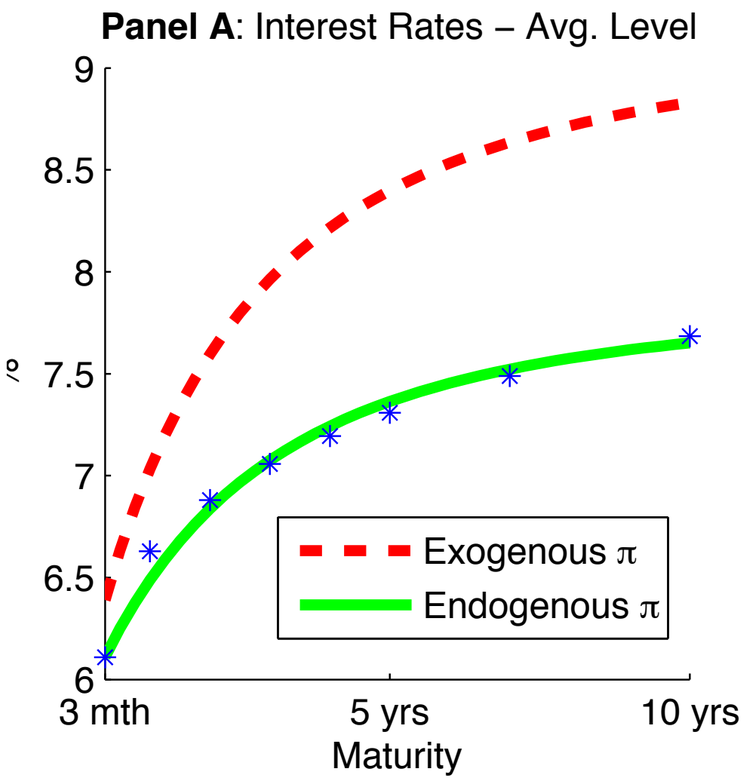
What do policy shocks do?

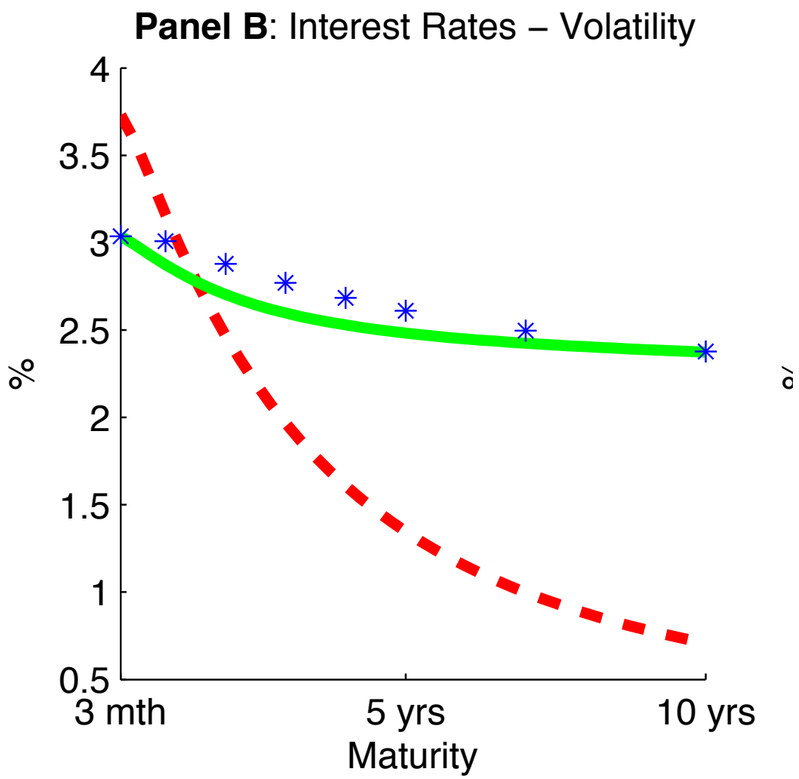
Our approach

No-arbitrage factor model for real rates depending on output and economic environment

Policy rule for short-term rates, simultaneously determines inflation and nominal rate process and so determines the entire term structure

The effect of policy





Bond returns are sensitive to the policy rule

The more policy rates respond to output, the better long term bonds are at hedging risk, and the lower the risk compensation in long-term bonds

Credibility is key: a short term change in the rule is much less effective than an long term change

More aggressive inflation response

Inflation drops

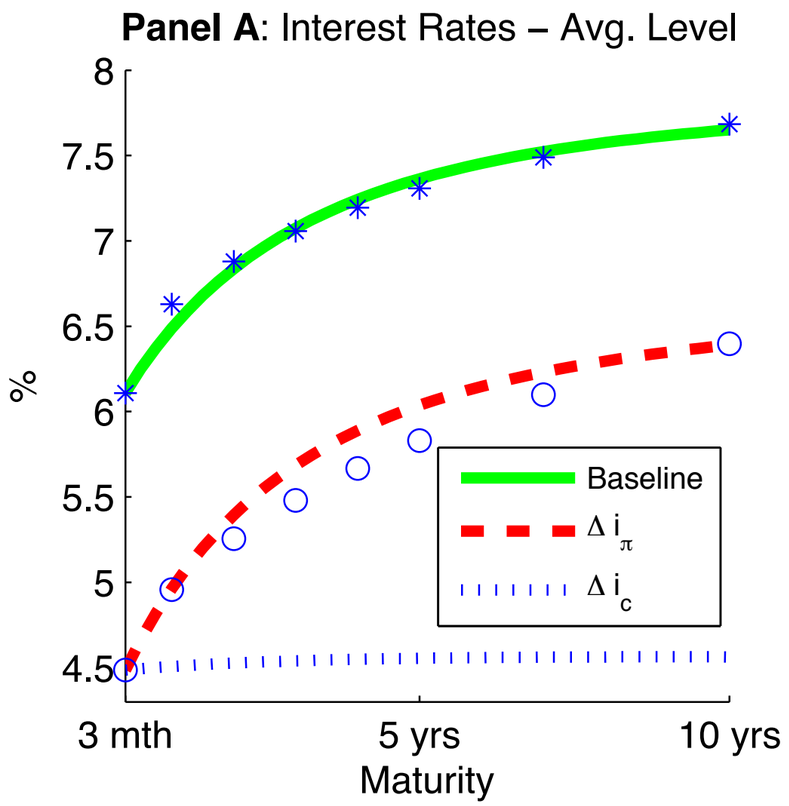
Reduces short term nominal rates

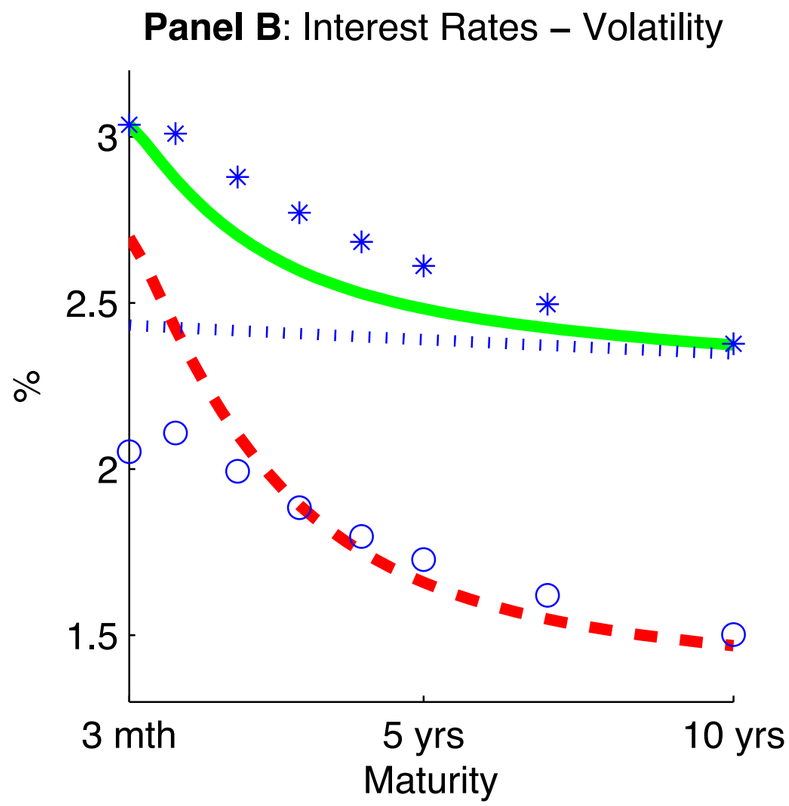
Reduces inflation volatility

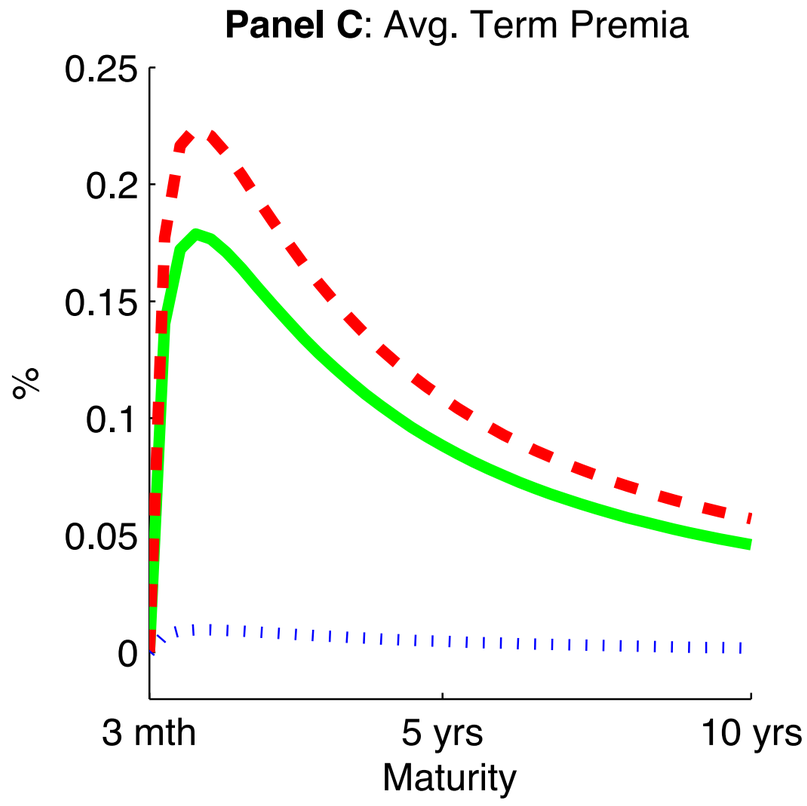
Makes long-term bonds worse inflation hedges: makes the curve steeper

Smoothes out rates

A change in policy rules







Hedging inflation with long term bonds

Even if the Fed is not changing real rates, it has an impact on inflation risk and the correlation of real and nominal rates

Less feedback from inflation to rates means more inflation risk, but longer bonds become better hedges: flattens the curve

Credibility: there is a difference between committing to a policy and a short term deviation