



CENTRAL
to
AMERICA'S
ECONOMY™

Permazero in Europe?

James Bullard

President and CEO, FRB-St. Louis

International Research Forum on Monetary Policy

Ninth Conference

18 March 2016

Frankfurt am Main, Germany

Any opinions expressed here are my own and do not necessarily reflect those of the Federal Open Market Committee.

Introduction

Recent neo-Fisherian ideas

- The purpose of this conference is to promote the discussion of innovative research on issues relevant for monetary policy.
- In this spirit, I will discuss some recent “neo-Fisherian” ideas and what they might mean for the G-7 over the medium term.
- Some references:
 - J. Bullard, 2015, [“Permazero,”](#) speech delivered at the Cato Institute’s 33rd Annual Monetary Conference, Washington, D.C.
 - J. Cochrane, 2015, [“Permazero,”](#) blog post on *The Grumpy Economist*, November 12.
 - J. Taylor, 2015, [“Staggering Neo-Fisherian Ideas and Staggered Contracts,”](#) blog post on *Economics One*, November 22.

Permazero

- These ideas may be quite important for the G-7 over the medium term.
- At this point they are untested and remain topics for monetary policy research.

The 1984-2007 Macroeconomic Equilibrium

Key argument for normalization in the U.S.

- While the FOMC's goals have been met, the FOMC's policy settings remain extreme.
- The goals: Labor markets are close to normal, and inflation net of the oil price shock is reasonably close to target.
- The policy settings: The policy rate remains about 300 basis points below the FOMC's long-run level, and the balance sheet remains more than \$3.5 trillion larger than its pre-crisis level.
- Prudent policy suggests edging the policy rate and the balance sheet toward more normal levels.

The 1984-2007 macroeconomic equilibrium

- Implicit in this argument is a desire to return to the 1984-2007 macroeconomic equilibrium. Why?
 - Relatively long economic expansions.
 - Relatively shallow recessions.
 - Relatively good monetary policy.
 - Well understood by policymakers and financial markets.
- That equilibrium was associated with a higher nominal interest rate structure than we have today.
- However, what if we cannot return to such a situation?

Rethinking monetary policy

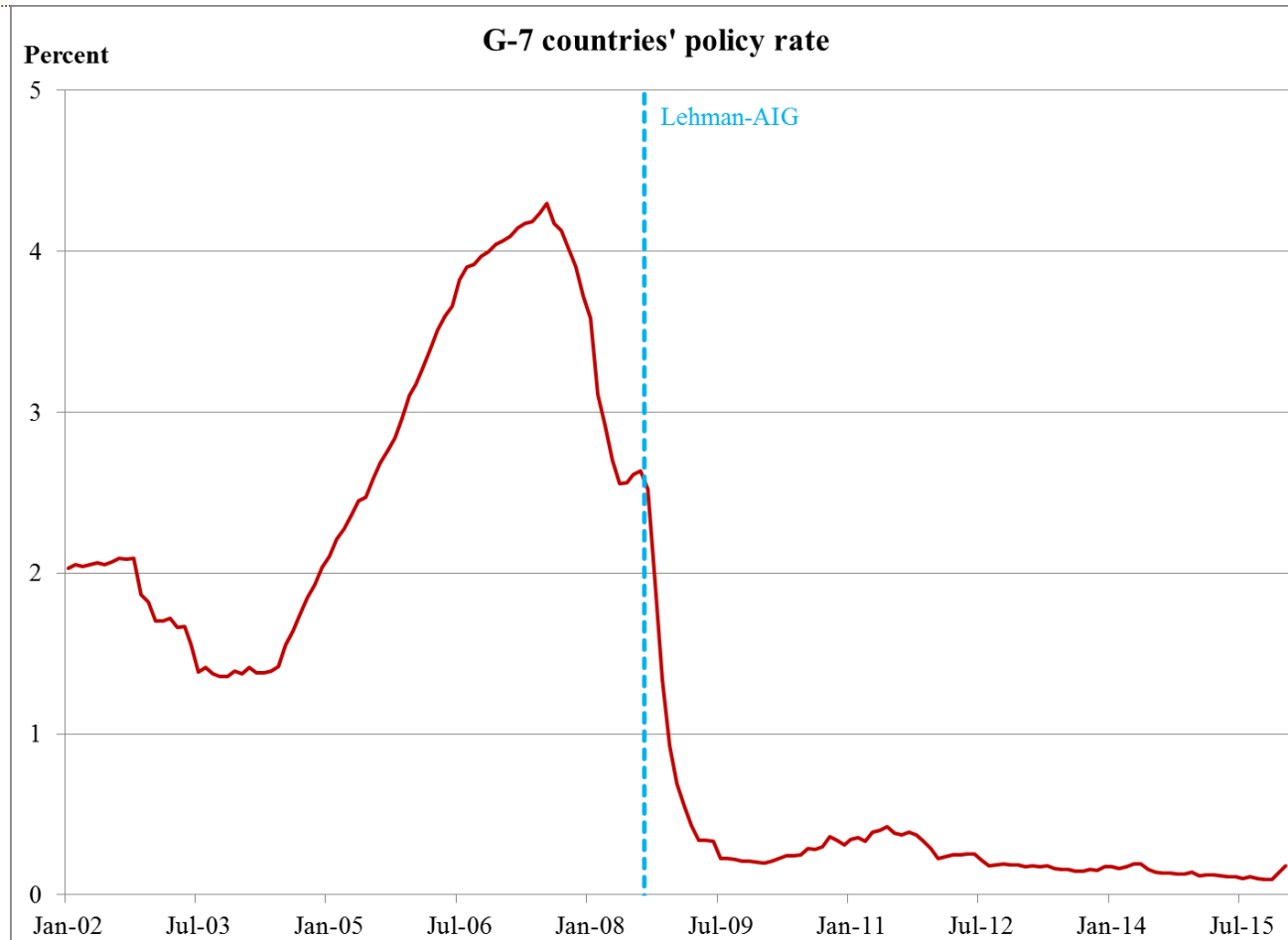
- Let's suppose, for the sake of argument, that we will not return to the 1984-2007 equilibrium.
- What are the implications for the future of monetary policy?
- This is an interesting scenario because:
 - The U.S. has already been near the zero lower bound (ZLB) for more than seven years.
 - G-7 average short-term nominal interest rates will not be far off zero over the medium term, even with liftoff in the U.S. and U.K.
 - Negative shocks are always possible, which may push short-term nominal rates back to the ZLB.

Permazero

ZIRP as an interest rate peg

- Zero interest rate policy (ZIRP) has usually been viewed as temporary and as part of a policy reaction to a very large macroeconomic shock.
- But ZIRP or near-ZIRP has been in place for seven years, far beyond the duration consistent with ordinary business cycle fluctuations.
- Arguably, this is an *interest rate peg*—a constant value of the policy rate independent of changes in macroeconomic conditions.

An interest rate peg?



An interest rate peg as poor policy

- 1970s view: An interest rate peg is poor monetary policy.
- See, for instance, Sargent and Wallace (1975).*
- Basic argument: Trying to keep the short-term nominal interest rate unnaturally low would lead to instability in the form of very high inflation.
- Yet today we have had ZIRP or near-ZIRP for seven years, and inflation remains below target.
 - Perhaps inflation is still in the pipeline?
 - Or, perhaps, is it time for a new model?

Neo-Fisherian ideas

- The core neo-Fisherian idea is that the interest rate peg may not be unstable as Sargent and Wallace suggested, but instead can be stable under some circumstances.
- ZIRP, far from being a harbinger of runaway inflation, would instead dictate medium- and long-term inflation outcomes.
- The “neo-Fisherian” label comes from emphasizing that the Fisher equation (nominal interest rate = real rate + expected inflation) holds in all modern macroeconomic models.
- If the private sector determines the real rate, then the nominal interest rate policy choice determines the expected rate of inflation, which in turn determines the actual inflation rate.

Cochrane (2016)

Cochrane (2016)

- John Cochrane (2016) provides a recent analysis of this issue in the most standard of macroeconomic models used for monetary policy, the linearized three-equation New Keynesian model.
 - J.H. Cochrane, 2016, “Do Higher Interest Rates Raise or Lower Inflation?” Unpublished manuscript, University of Chicago Booth School of Business.
- Cochrane’s message: Neo-Fisherian effects can be very important even in the most ordinary of macroeconomic models.

Standard NK model *

- Intertemporal Euler equation

$$x_t = E_t x_{t+1} - \sigma(i_t - E_t \pi_{t+1})$$

- Phillips curve

$$\pi_t = \beta E_t \pi_{t+1} + \kappa x_t$$

- x_t : output gap
- i_t : nominal interest rate deviation
- π_t : inflation deviation

Solution via Werning (2012) *

- Fundamental (i.e., no sunspots) solution

$$\pi_{t+1} = \frac{\kappa\sigma}{\lambda_1 - \lambda_2} \left[\sum_{j=0}^{\infty} \lambda_1^{-j} i_{t-j} + \sum_{j=1}^{\infty} \lambda_2^j E_{t+1} i_{t+j} \right]$$

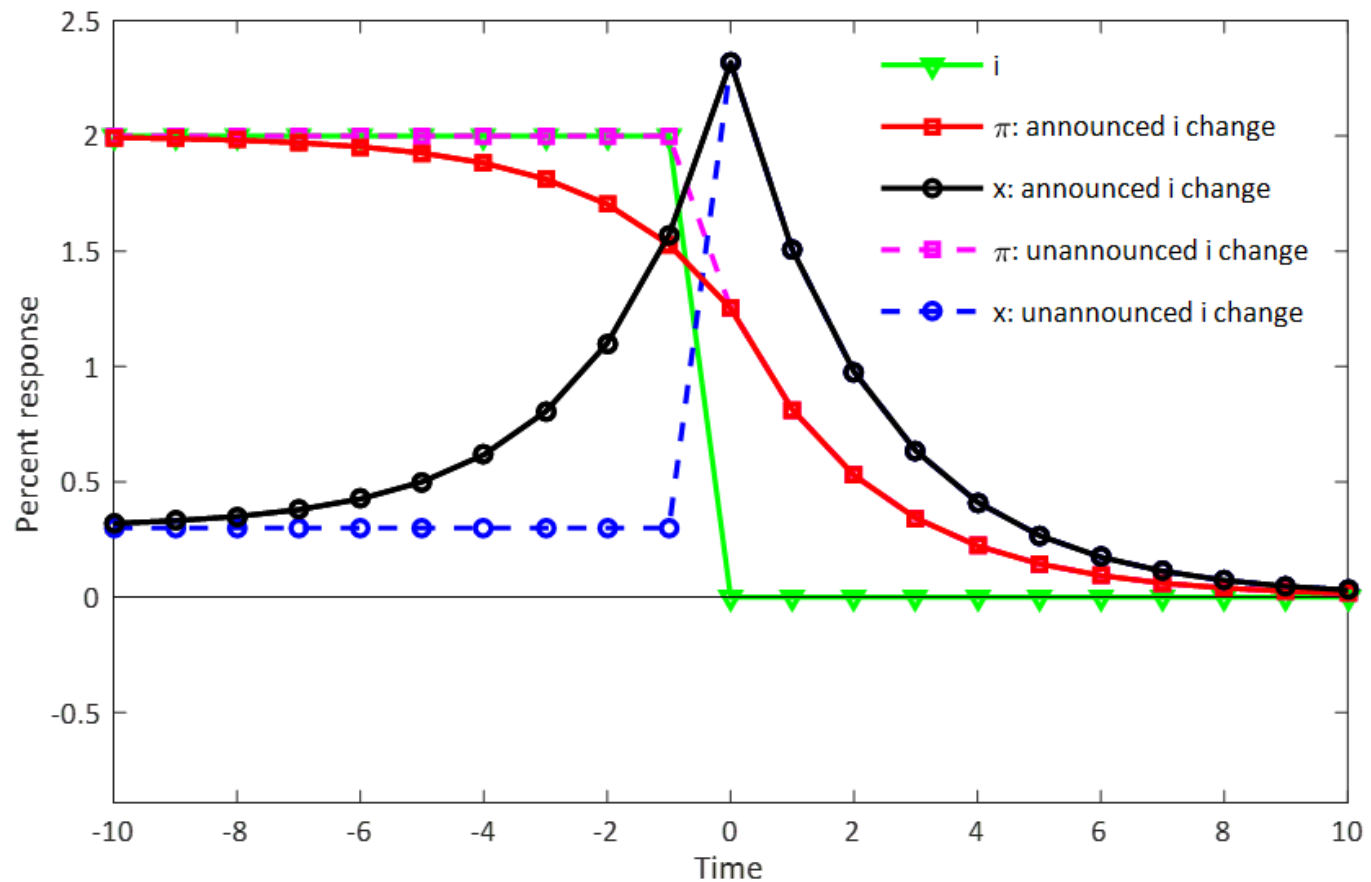
$$\kappa x_{t+1} = \frac{\kappa\sigma}{\lambda_1 - \lambda_2} \left[\left(1 - \frac{\beta}{\lambda_1}\right) \sum_{j=0}^{\infty} \lambda_1^{-j} i_{t-j} + \left(1 - \frac{\beta}{\lambda_2}\right) \sum_{j=1}^{\infty} \lambda_2^j E_{t+1} i_{t+j} \right]$$

$$\lambda_2 < 1 < \lambda_1$$

Aspects of the equilibrium

- The policymaker is choosing the interest rate sequence, and the rest of the model is tracing out the effects on the output gap and inflation.
- Inflation adjusts to the choice of interest rate sequence.
- A low interest rate sequence choice, such as ZIRP, eventually puts downward pressure on inflation.
- This is shown on the right hand side of the following chart.
- If ZIRP continues indefinitely, then nothing further happens in this economy.
 - This is “permazero.”

A sharp policy rate decrease into permazero



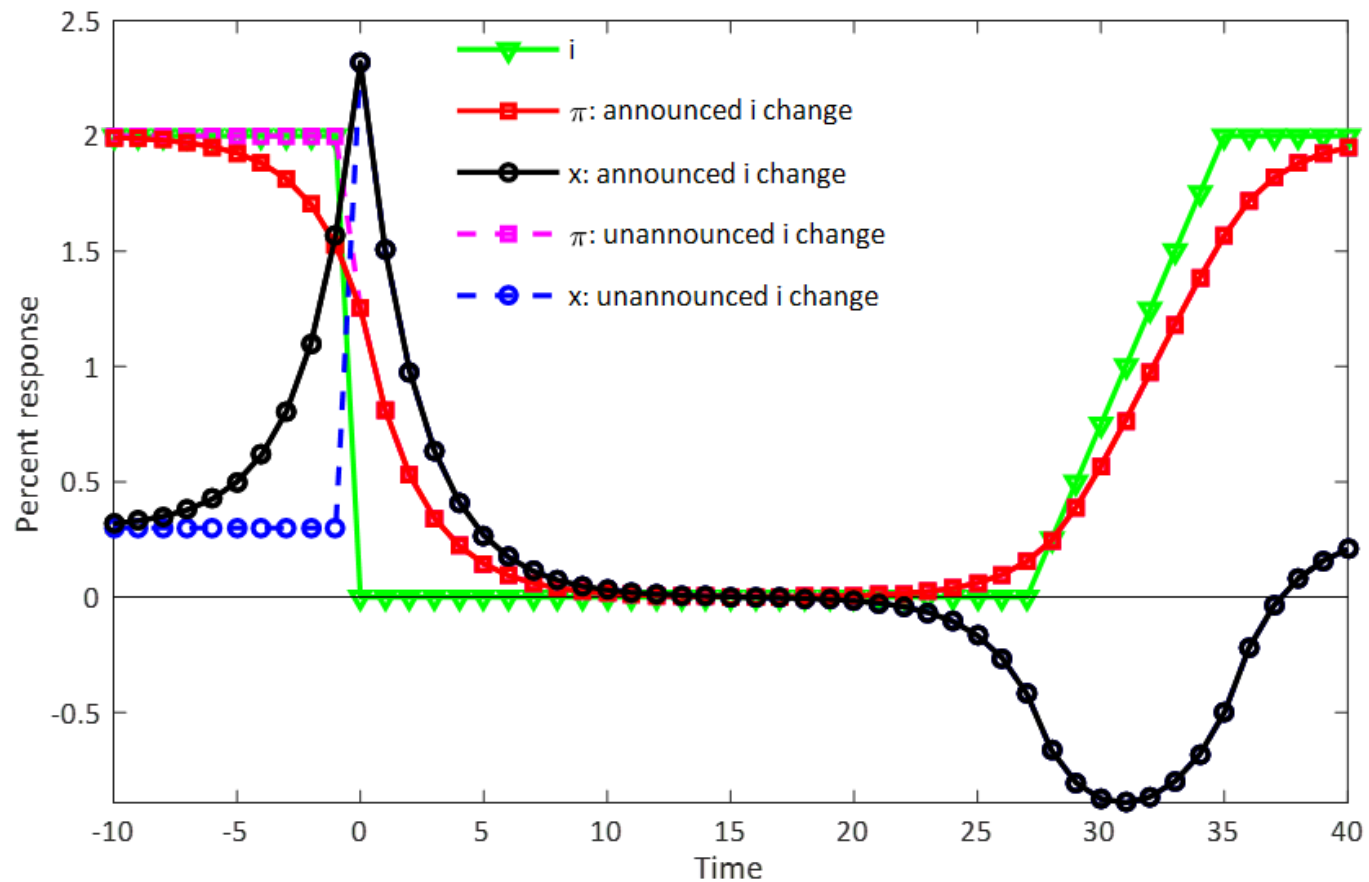
Policy implications for current events

- The policy implications of neo-Fisherian ideas are profound.
- The continuing ZIRP in the G-7, far from putting dangerous upward pressure on inflation, may be leading us to an outcome with low nominal interest rates and low inflation that can last for a very long time.
- This contrasts sharply with conventional wisdom and central bank rhetoric, including much of my own, which emphasizes that ZIRP is putting upward pressure on inflation and offers the best hope for returning inflation to target.
- Thus neo-Fisherian ideas provide food for thought.

Reversibility

- Authors like Benhabib, Schmitt-Grohé and Uribe (2001) and Bullard (2010) suggest that a low nominal interest, low inflation equilibrium is a steady state which is difficult to exit.*
- In contrast, Cochrane's analysis suggests that inflation will return to target if the interest rate sequence is set appropriately.
- Consider the same policy experiment as in the previous chart.
- However, now after seven years at zero, the policymaker gradually returns the policy rate to its previous level.

A gradual policy rate increase out of permazero



Summary

- The middle part of the previous chart shows that, if ZIRP is maintained, then the economy simply remains at the permazero state and the inflation target of 2 percent is never achieved.
- A policy of gradual nominal interest rate normalization will return inflation to target, and output will adjust, undoing the expansionary effects on output from the initial move to ZIRP.
- These effects occur in the most standard of macroeconomic models.
 - For a discussion, see García-Schmidt and Woodford (2015).*

Empirical Evidence

Empirical evidence

- How does this match up with actual experience?
- To try to get a handle on this in one chart, I will look at the G-7 averages for short-term nominal interest rates and inflation since 2002.
 - G-7 policy is unlikely to significantly deviate from ZIRP over the medium term.
- The Lehman-AIG event (September 2008) sent G-7 policy rates to near zero.
- After the crisis, G-7 inflation returned to target.
- Since 2012, however, inflation has drifted lower by about 300 basis points.

G-7 countries' aggregated inflation and policy rates

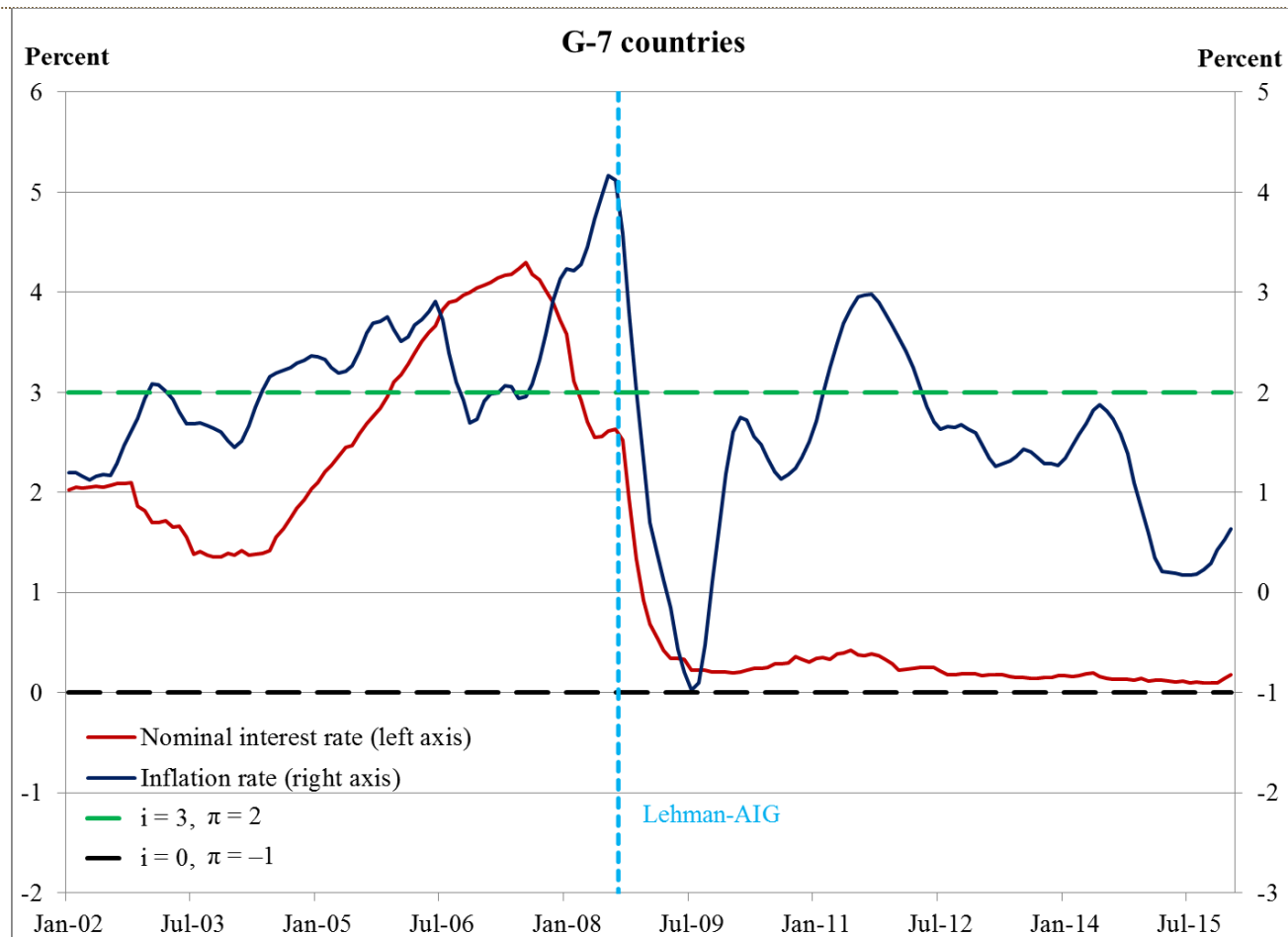
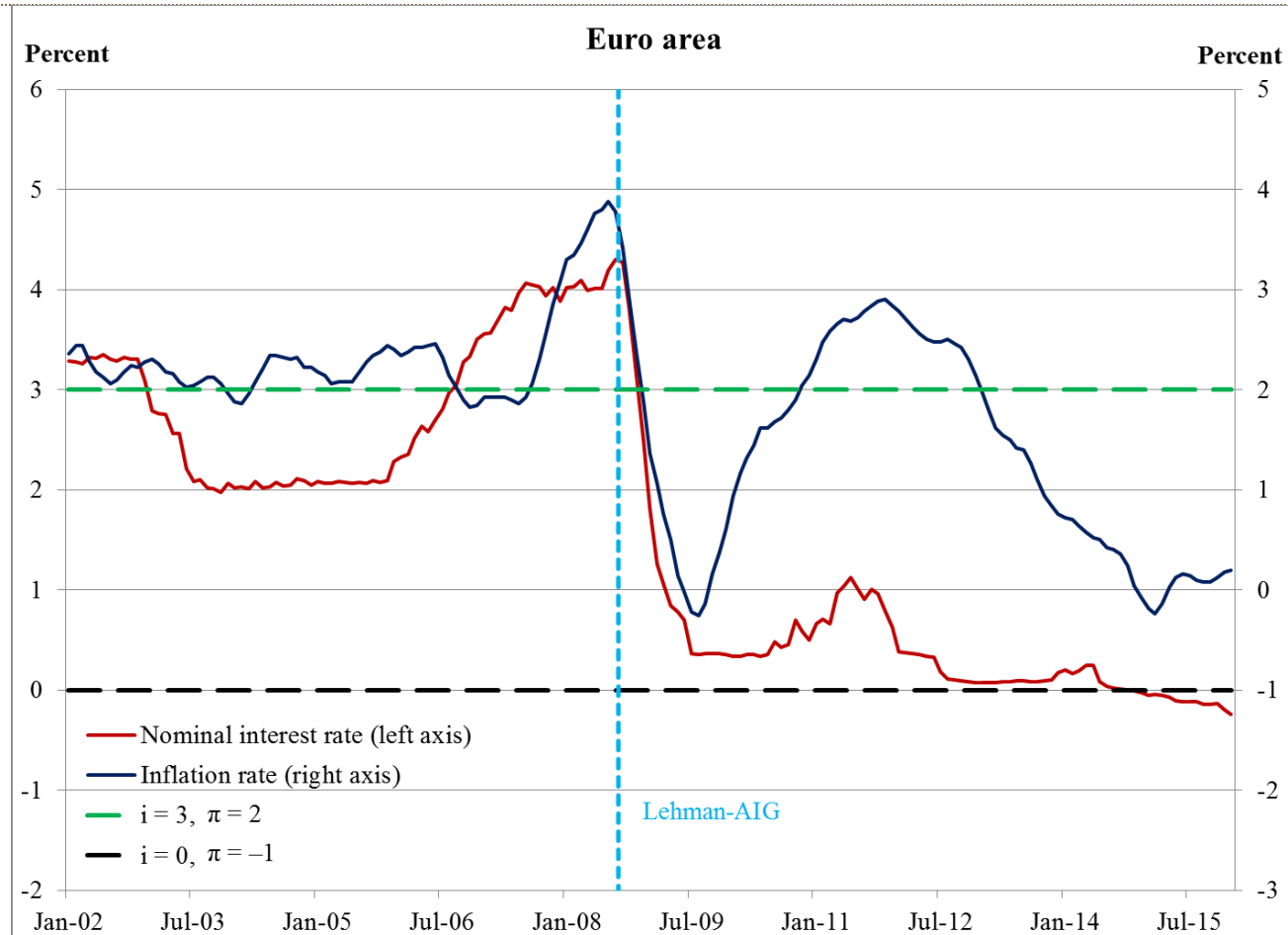


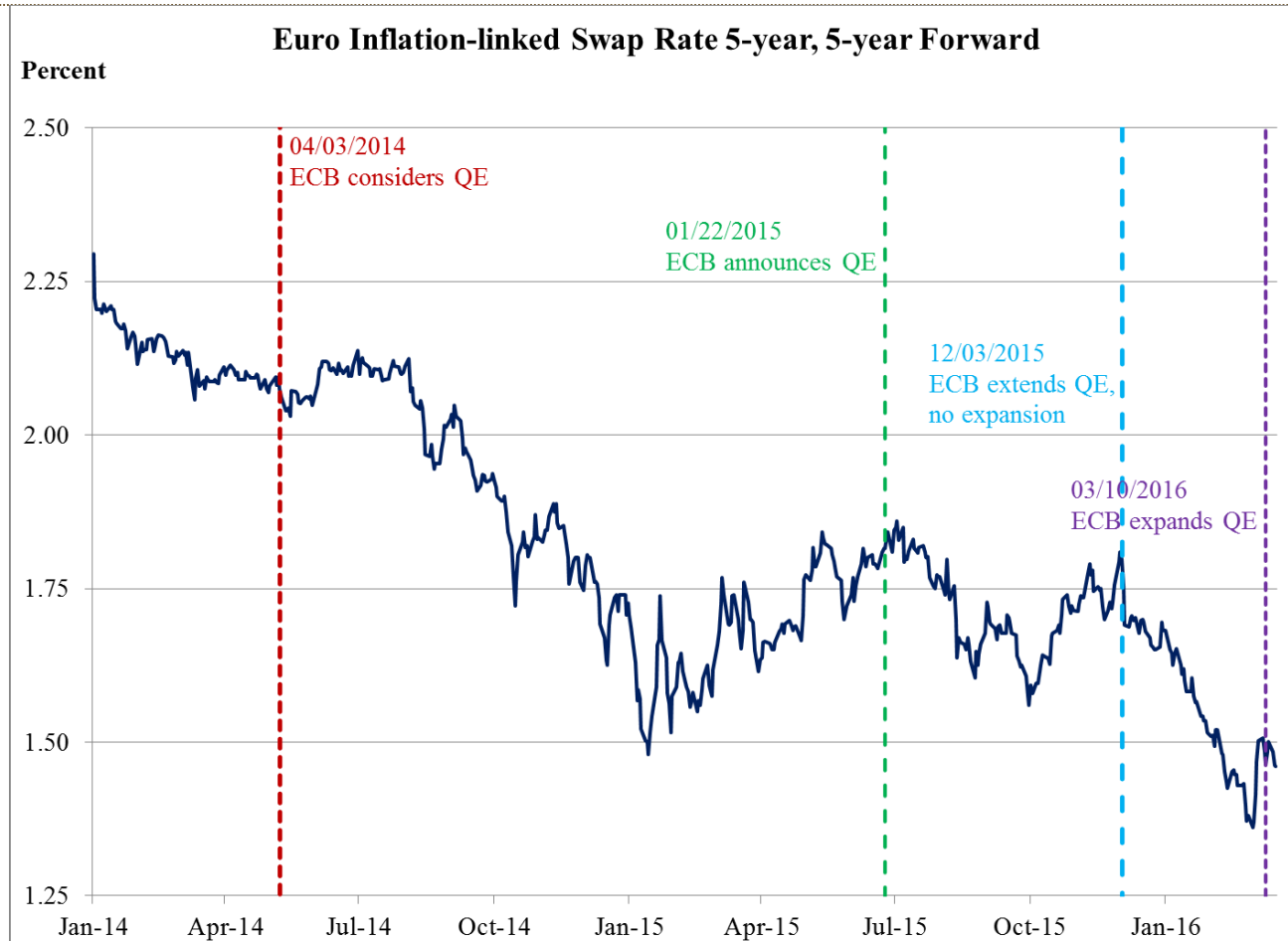
Chart summary

- I want to think of the previous chart as follows:
 - The left-hand side represents the ordinary, 1984-2007 equilibrium of the NK model.
 - The right-hand side represents the possible convergence to the permazero outcome.
- The chart portrays G-7 averaged data, but the European data alone are more compelling for the neo-Fisherian story.
- This is shown in the following charts.

Euro area inflation and policy rates



Euro area inflation expectations



Interpreting the empirical evidence

- Developments in the G-7 since 2012 could be interpreted as neo-Fisherian effects taking hold.
- ZIRP policy was maintained far longer than originally envisioned.
 - Of course, one has to be careful with any interpretation of the data, since other shocks have occurred during the last 3.5 years, including a very large oil price decline.
- Key question: If ZIRP was sufficient to drive inflation back to target by 2012, why has continued ZIRP not kept inflation close to target or pushed it even higher?

Consequences

Consequences

- Suppose we do remain at zero or near-zero policy rates over the medium term due to neo-Fisherian effects.
- What are the consequences? How should we think of such a situation?
- I can think of six areas on which we may want to focus.

Six possible consequences of neo-Fisherianism

1. Promises to keep the policy rate at zero simply reinforce the equilibrium and do not have conventional expansionary effects. Policymakers would have to come to grips with this.
2. Inflation remains persistently below target. Policymakers may wish to lower the inflation target to match actual outcomes.
3. Longer-run growth is driven by human capital accumulation and technological progress. This would continue to be true, so policymakers could expect normal growth.

Six possible consequences of neo-Fisherianism

4. The Friedman rule would arguably be achieved. This is a good outcome in many monetary theory contexts.
5. The risk of asset price fluctuations may be high, with unknown consequences. A standard theoretical result in the New Keynesian model is that, under an interest rate peg, there are many alternative equilibria which can be highly volatile.
6. The limits on normal monetary policy through its inability to adjust short-term nominal interest rates would continue to put heavy pressure on alternative conceptions of monetary policy, such as quantitative easing.

Summary

Summary

- Consistent with the theme of this conference, I have focused on issues that may be important for the medium- and long-term monetary policy outlook.
- Neo-Fisherian ideas may have an important impact on our thinking about monetary policy in the future.



CENTRAL
to
AMERICA'S
ECONOMY™

Federal Reserve Bank of St. Louis

stlouisfed.org

Follow us on Twitter

twitter.com/stlouisfed

Federal Reserve Economic Data (FRED)

research.stlouisfed.org/fred2/

James Bullard

stlouisfed.org/bullard/