DISCUSSION OF "TIME CONSISTENCY AND THE DURATION OF GOVERNMENT DEBT," BY BHATTARAI, EGGERTSSON, AND GAFAROV

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Any opinions expressed here are mine and do not necessarily reflect those of others on the Federal Open Market Committee.

Introduction

DISCUSSION FOCUS

- I will focus my discussion on three main areas.
- First, I will talk about financial market accounts of the so-called "taper tantrum" of 2013.
  - I will interpret these accounts as consistent with the signalling theory of QE outlined by Bhattarai, Eggertsson, and Gafarov.
- Second, I will talk about econometric characterizations of the macroeconomic effects of monetary policy.
  - I will interpret rudimentary evidence in this area as inconsistent with the Bhattarai et. al. signalling theory of QE.
- Third, I will talk about the potential existence of a second steady state in this and other analyses of the zero lower bound.
  - The profession is not paying enough attention to this possibility.

THE RISE OF QUANTITATIVE EASING

- In the U.S., the policy rate encountered the zero lower bound in 2008, about six years ago.
- Key question in modern monetary policy: How to conduct a systematic countercyclical monetary policy once the policy rate is at zero?
- Two answers:
  - Credibly promise to remain at the ZLB longer than would otherwise have been anticipated.
  - Depart from interest rate targeting—"quantitative easing."

QE EFFECTIVENESS

- Is properly-run QE an effective substitute for ordinary countercyclical monetary policy?
- Some standard theories suggest no effects: Williamson (2012, *AER*), Curdia and Woodford (2010, *St. Louis Fed Review*; 2011, *JME*).
- Event study econometric evidence suggests otherwise: Krishnamurthy and Vissing-Jorgensen (2011, *BPEA*), Neely (2014, working paper, *St. Louis Fed*).
- Let's look at the empirical evidence.

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QE Effectiveness

and the Signalling Theory

TWO NATURAL EXPERIMENTS

- The FOMC graciously provided two natural experiments during the summer of 2013, the heart of the so-called "taper tantrum."
- The Committee adopted a unexpectedly hawkish QE policy announcement at its June 2013 meeting.
- The Committee then reversed course with an unexpectedly dovish QE policy announcement at its September 2013 meeting.
- The *financial market signature* of these surprise announcements match what would be expected from surprise announcements in times of conventional monetary policy.
  - That is, tighter policy should be associated with higher real interest rates, lower expected inflation, lower equity valuations, and a stronger currency.
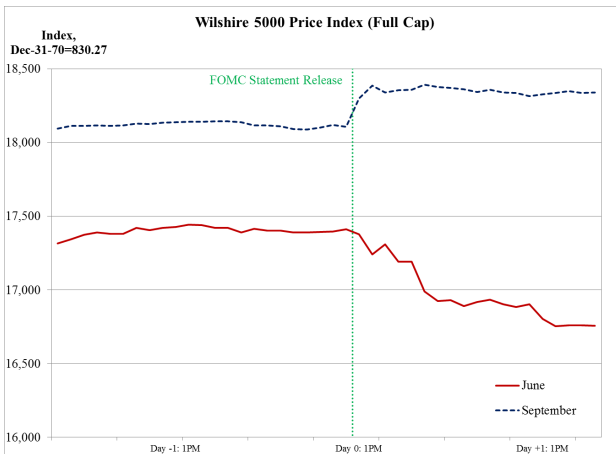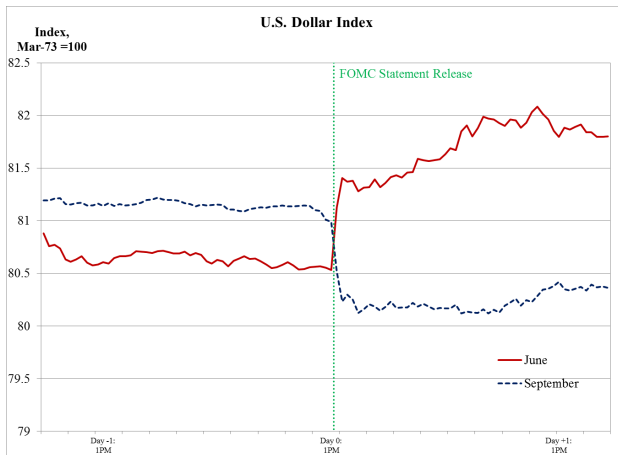
REAL INTEREST RATES

5-year TIPS Yield

Percent p.a.

June
September

FOMC Statement Release
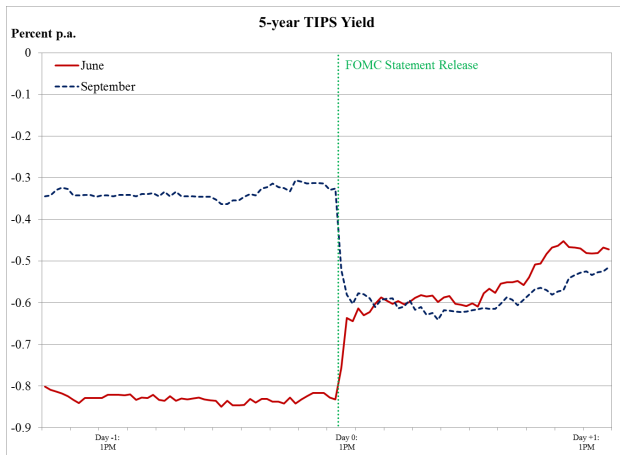
EXPECTED INFLATION
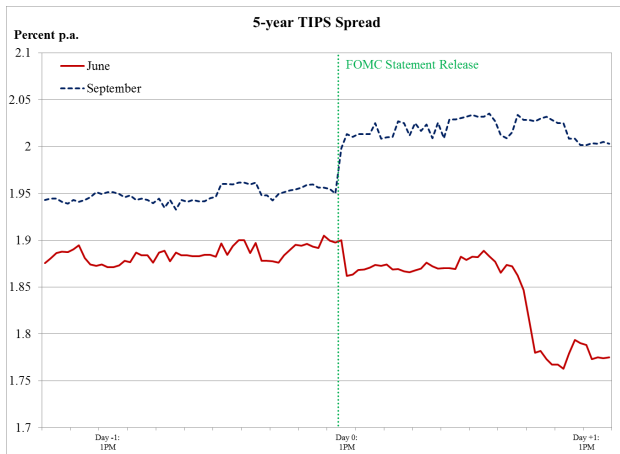
EQUITY PRICES

EXCHANGE RATE

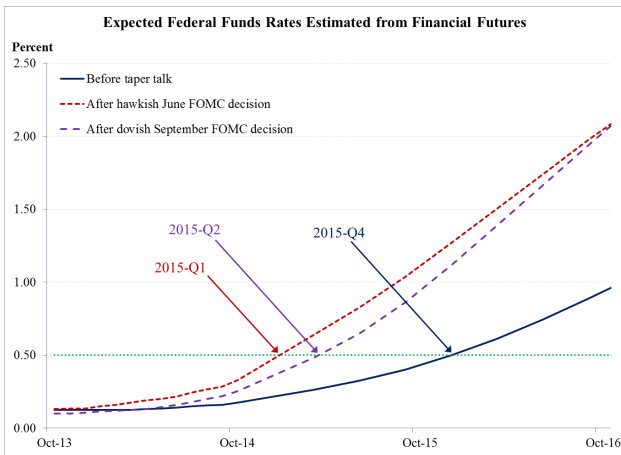# BERNANKE ASSESSMENT

- "The problem with QE is that it works in practice, but not in theory."—Ben Bernanke, January 16, 2014.

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SPILLOVER TO FORWARD GUIDANCE

- The FOMC thought that changes in the proposed pattern of asset purchases should not affect the forward guidance of the Committee concerning the path of the policy rate.
- However, the policy rate path moved as well.

SPILLOVER TO FORWARD GUIDANCE

Expected Federal Funds Rates Estimated from Financial Futures

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CONNECTION TO BHATTARAI, EGGERTSSON, GAFAROV

- Possibly QE provides a signal concerning the likely future path of the policy rate, and it is this signal that links the theory with the data.

- This is the theory of Bhattarai, Eggertsson, and Gafarov.

- I interpret the narrative just given as consistent with the proposed theory.

Theory and Data

GOVERNMENT DEBT

- The model has a has a perpetuity bond with geometrically declining coupons.
- The duration parameter is given by ρ, with $\rho = 0$ a one-period bond and $\rho = 1$ a perpetuity.
- QE is modelled as reducing ρ for the private sector because the monetary authority buys longer-term debt.

AVERAGE DEBT MATURITY IN THE DATA

- Is the average debt maturity of the U.S. government an important macroeconomic variable?
- The conventional wisdom in macroeconomics has been "no."
- This variable does not show up in typical econometric characterizations of the U.S. macroeconomy.
- This is because the correlation with key variables is low.

DEBT IN THE U.S. AFTER 2008

- We can think of U.S. federal debt as a ratio to GDP. This number rose after 2008 from about 0.8 to about 1.2.

- Fed holdings of federal debt plus mortgage-backed securities rose dramatically, from about 5 percent of GDP to over 20 percent of GDP.

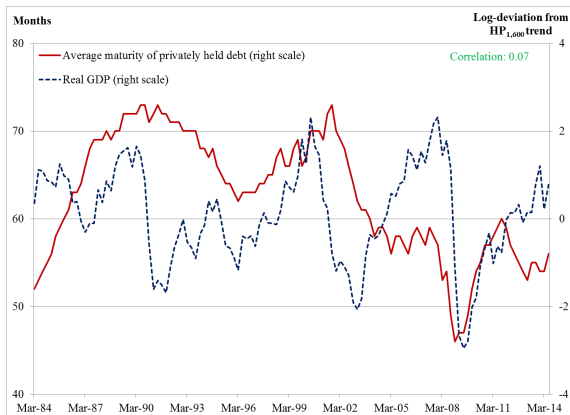- These movements are associated with the Fed's QE programs.

DEBT MOVEMENTS SINCE 1984

Debt and MBS's holdings

Percent of nominal GDP

Rest of the World
Domestic non-Fed
Fed
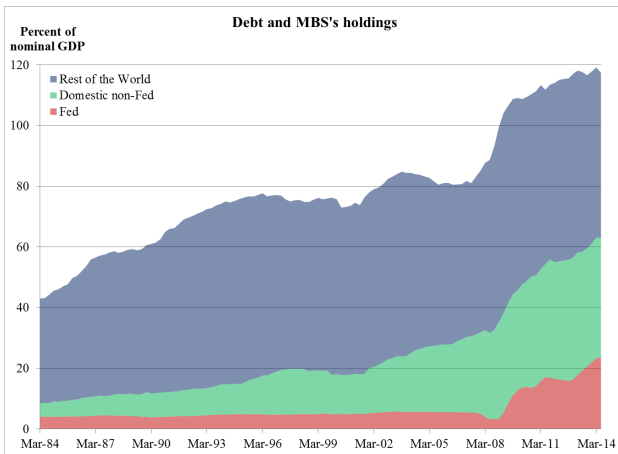
AVERAGE MATURITY STRUCTURE OF THE DEBT

- The average maturity structure of the debt has not been highly correlated with real variables like GDP.
  - The correlation may be better (more positive) since 2008.
- Still the average maturity of the debt held by the public seems to have been rising since the advent of QE, not falling as suggested by the theory.
- This leaves open the question of how to reconcile what happened during the QE era in the U.S. versus the signalling theory outlined by the authors.

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AVERAGE MATURITY OF THE DEBT AS A MACRO VARIABLE

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- Research by Benhabib, Schmitt-Grohe and Uribe (2001, *JET*) suggests an important perspective on the zero lower bound.
- Their model includes the following features:
  - A Fisher relation.
  - The zero lower bound on nominal interest rates.
  - A policymaker committed to using a short-term nominal interest rate to conduct monetary stabilization policy.
- Many modern macroeconomic models have these three generic features.

A SECOND STEADY STATE

- Benhabib, Schmitt-Grohe and Uribe wanted to emphasize a global analysis.
- They showed that in their economy, a second steady state exists. This second "unintended" steady state is characterized by very low inflation (or mild deflation), and very low nominal interest rates.
- This steady state coexists with the "targeted" steady state—characterized by higher nominal interest rates and higher inflation—which is the one most monetary policy analyses focus upon.

IGNORING THE UNINTENDED STEADY STATE

- For some purposes, especially those that mainly concern local dynamics about the intended steady state, it may be reasonable to ignore the existence of the unintended steady state.

- But for situations involving very low nominal interest rates and very low inflation rates of the type that would normally be observed in the unintended steady state, it is no longer practical or reasonable to ignore the unintended steady state.

- It has to be made a fundamental part of the analysis.

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MONETARY POLICY CONSEQUENCES

- Failing to properly address the dynamics of the model with two steady states may lead to poor policy advice.

- Much of the policy advice stemming from this model and those related to it is of the form, "When the ZLB is encountered, the policymaker must commit to remain at the ZLB even longer than expected in order to generate higher inflation expectations."

- Yet too much of a commitment to remain at the ZLB—in particular a permanent commitment—can only be consistent with the unintended steady state outcome, in which inflation remains permanently low and interest rates remain permanently at the ZLB.

- It may not always be good to double down on the low nominal interest rate commitment.
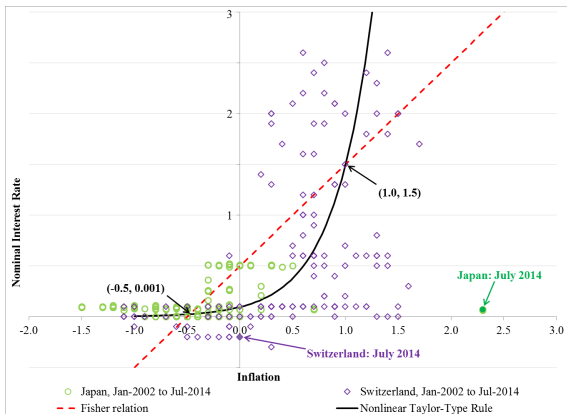
INTEREST RATES AND INFLATION IN THE U.S. AND JAPAN
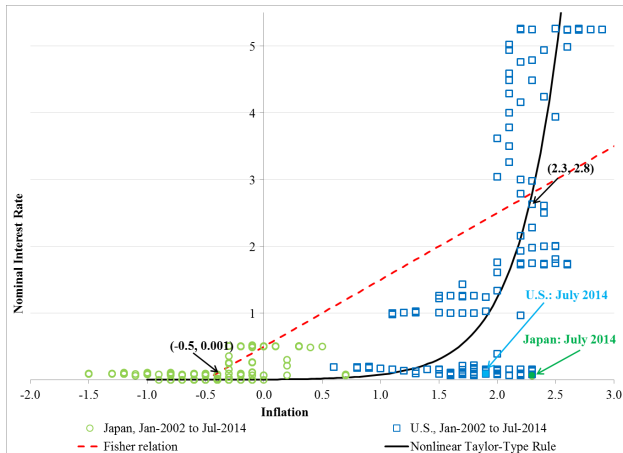
INTEREST RATES AND INFLATION IN THE EURO AREA AND JAPAN
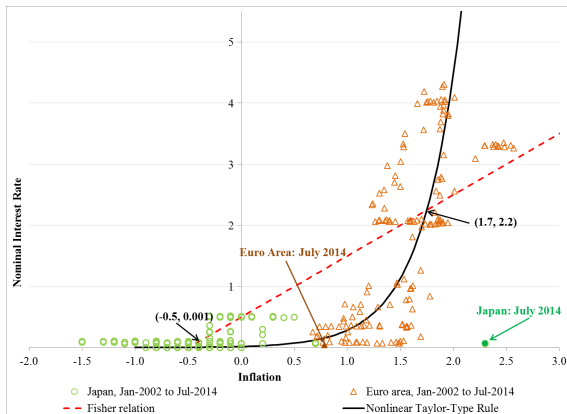
INTEREST RATES AND INFLATION IN SWITZERLAND AND JAPAN

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- The financial market description of recent quantitative easing moves seems to be consistent with the signalling theory of QE laid out by the authors.

- The emphasis on the maturity structure of the U.S. federal debt seems to be inconsistent with macroeconometric descriptions of the effects of U.S. monetary policy.

- Ignoring the possible existence of a steady state at exactly the key focal point—zero nominal interest rates and low inflation—is problematic for the analysis.