

Comments on

**“Time Consistency and the Duration of Government Debt:
A Signalling Theory of Quantitative Easing”
*by S. Bhattarai, G. Eggertsson, and B. Gafarov***

**Andrew Levin
IMF Research Fellow**

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*The views expressed are solely my own responsibility
and should not be interpreted as reflecting the views
of the International Monetary Fund or of anyone else.*

Expositional Suggestions

The government's flow budget constraint (p.38):

$$B_t^S + S_t(\rho)B_t = (1+i_{t-1})B_{t-1}^S + (\rho^0 + S_t^O(\rho))B_{t-1} + P_t(F_t - T_t)$$

A few expositional suggestions:

- No need for B_t^S in the government's budget constraint; rather, the **short-term risk-free rate** i_t can simply appear in the household's problem and can be viewed as analogous to the GC repo rate.
- Use $S_{t,t-j}$ to denote the **price at time t of a bond issued at time $t-j$** , and show that the problem can be encapsulated in terms of $S_t = S_{t,t}$.
- Use $B_{t,t-j}$ to denote the **number of bonds issued at time $t-j$ that remain outstanding at time t** , and then introduce $B_t = B_{t,t}$.

The Government's Nominal Budget Constraint

The government's budget constraint can be expressed as follows:

$$B_t = \rho B_{t-1} + \frac{P_t(F_t - T_t) + B_{t-1}}{S_t}$$

where B_t denotes the outstanding number of nominal bonds that will pay a coupon of \$1 next period and ρ^j dollars in subsequent periods. The **nominal primary deficit** $P_t(F_t - T_t)$ and the **coupon payments** on existing debt B_{t-1} are covered by issuing new bonds at price S_t .

The Evolution of Real Government Debt

The aggregate price level P_t need not be stationary, so it is sensible to reexpress the government's budget constraint as follows:

$$b_t = \rho \Pi_t^{-1} b_{t-1} + R_t (F_t - T_t + \Pi_t^{-1} b_{t-1})$$

where $b_t = B_t / P_t$ is the real debt stock, Π_t^{-1} is the gross inflation rate, and the nominal bond yield $R_t = 1 / S_t$ (i.e., yield = coupon / price), which is in turn given by the standard asset pricing relationship.

==> Generally speaking, the central bank can alleviate the debt burden by raising the inflation rate and/or reducing the nominal bond yield.

Two Polar Cases

With exogenous government spending, the log-linearized relations can be expressed as follows:

$$\hat{b}_t = \beta^{-1} (\hat{b}_{t-1} - \pi_t) + (1 - \rho) \hat{R}_t - \psi \hat{T}_t$$

$$\hat{R}_t = \rho \beta E_t \hat{R}_{t+1} + i_t$$

When the discount factor $\beta \approx 1$, the two polar cases can be given as follows:

- **Short-Term Debt ($\rho = 0$)**

$$\hat{b}_t = \hat{b}_{t-1} + (i_t - \pi_t) - \psi \hat{T}_t$$

- **Consol Bonds ($\rho = 1$)**

$$\hat{b}_t = \hat{b}_{t-1} - \pi_t - \psi \hat{T}_t$$

Key Assumptions about the Policy Framework

- The government makes a fully credible commitment to meet its longer-term debt obligations; i.e., there is **no sovereign default**.
- The government has **no ability to make conditional commitments** regarding the paths of its policy instruments (nominal interest rates and taxes).
- There is **no wall of separation** between the central bank and the finance ministry; i.e., the stance of monetary policy depends on fiscal considerations as well as the stability of prices and output.
- There are no tax collection costs in steady state, and hence the model **does not provide a theory for the steady-state level of public debt**.

Some Questions about the Solution Procedure

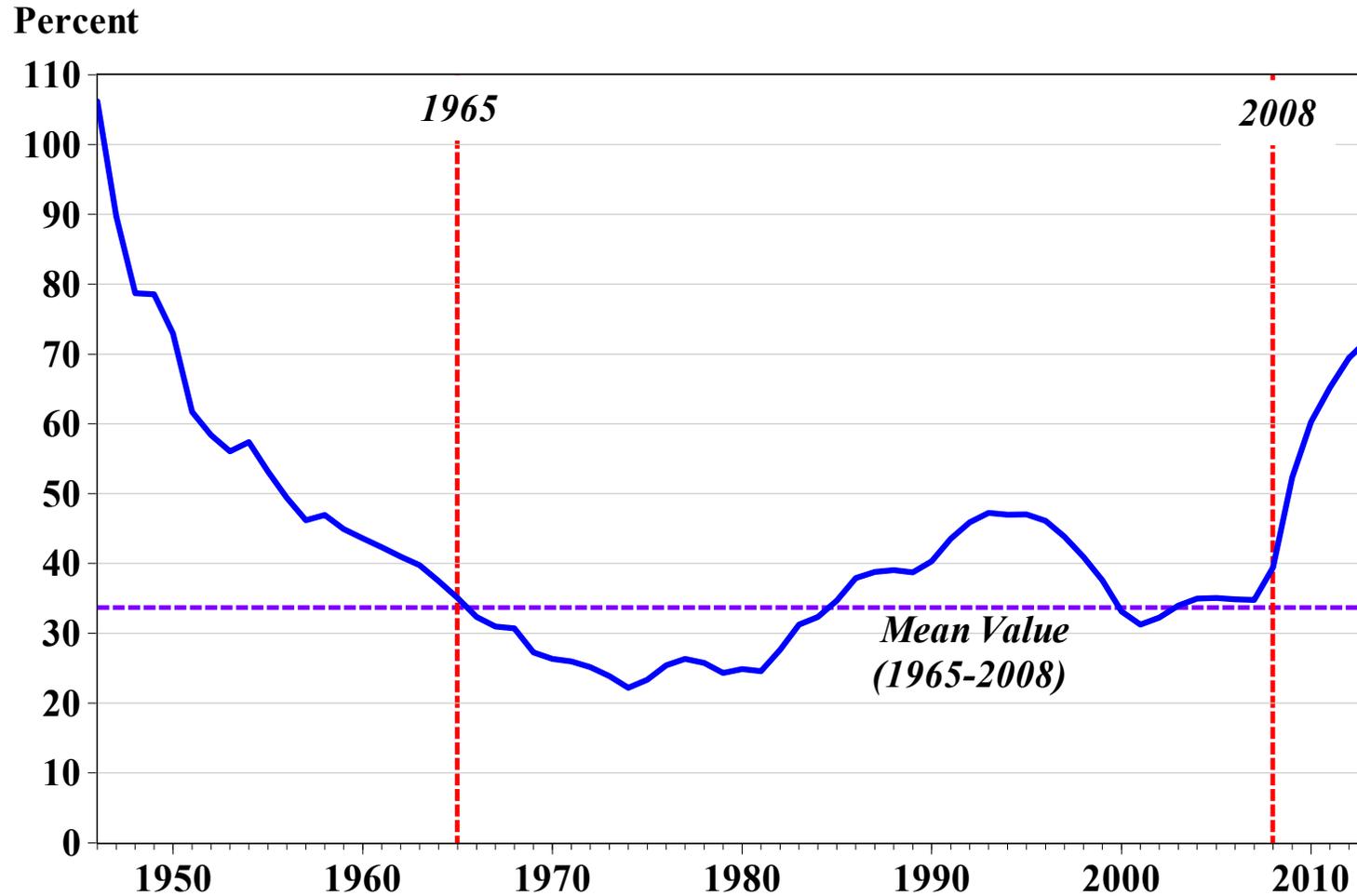
- Is the economy prone to **deterministic cycles**?
- Can we rule out the existence of **nonstationary equilibria**?
- Is there a **unique stationary equilibrium** for the log-linearized economy?

Positive and Normative Issues

- How relevant are these results for interpreting the evolution of U.S. monetary and fiscal policy during **“normal” times**; i.e., the post-WWII period prior to the global financial crisis?
- To what extent are the results helpful in interpreting the **post-crisis trajectory of U.S. monetary and fiscal policy**?
- To what extent should the results be viewed as **prescriptive** regarding the appropriate path of monetary and fiscal policy?

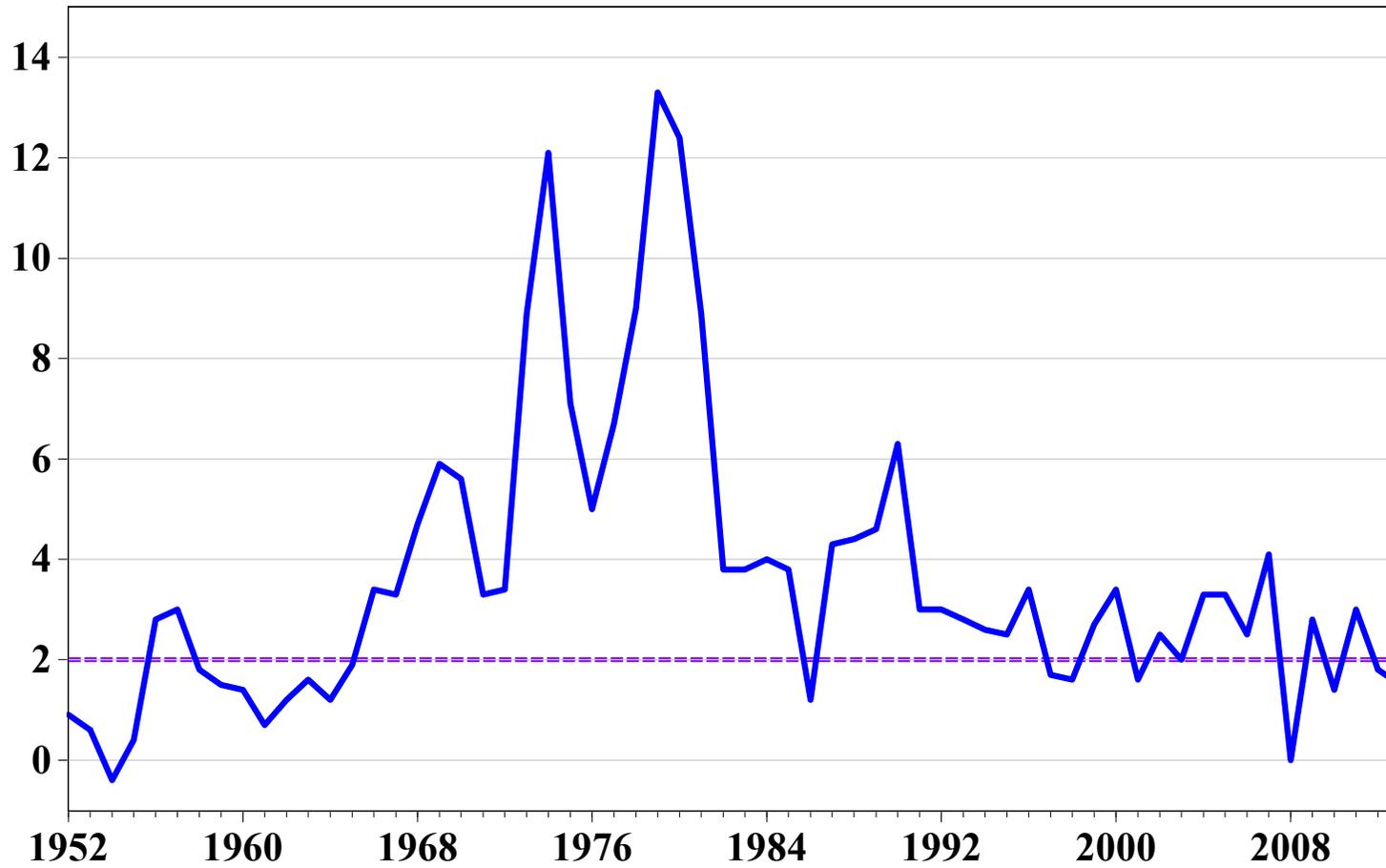
The Evolution of U.S. Government Debt, 1946-2013

(federal debt held by the public as a share of nominal GDP)



US Consumer Price Inflation, 1952-2013

Percent



The FOMC's First Round of Asset Purchases

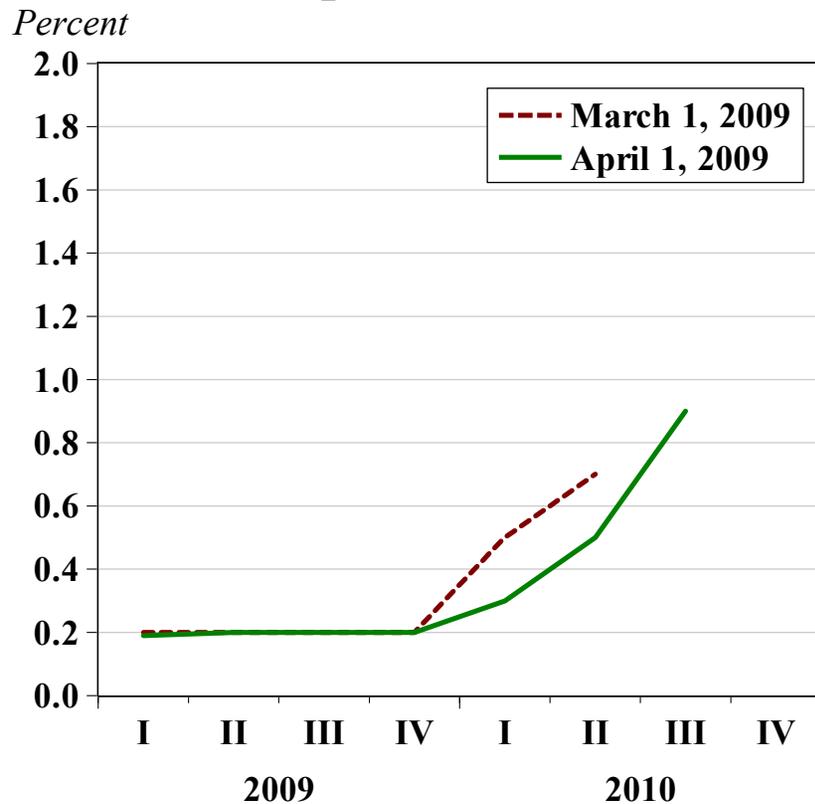
“The Federal Reserve announced today that it will initiate a program to purchase the **direct obligations of housing-related GSEs and mortgage-backed securities (MBS)** backed by Fannie Mae, Freddie Mac, and Ginnie Mae.”

(FRB Press Release, November 25, 2008)

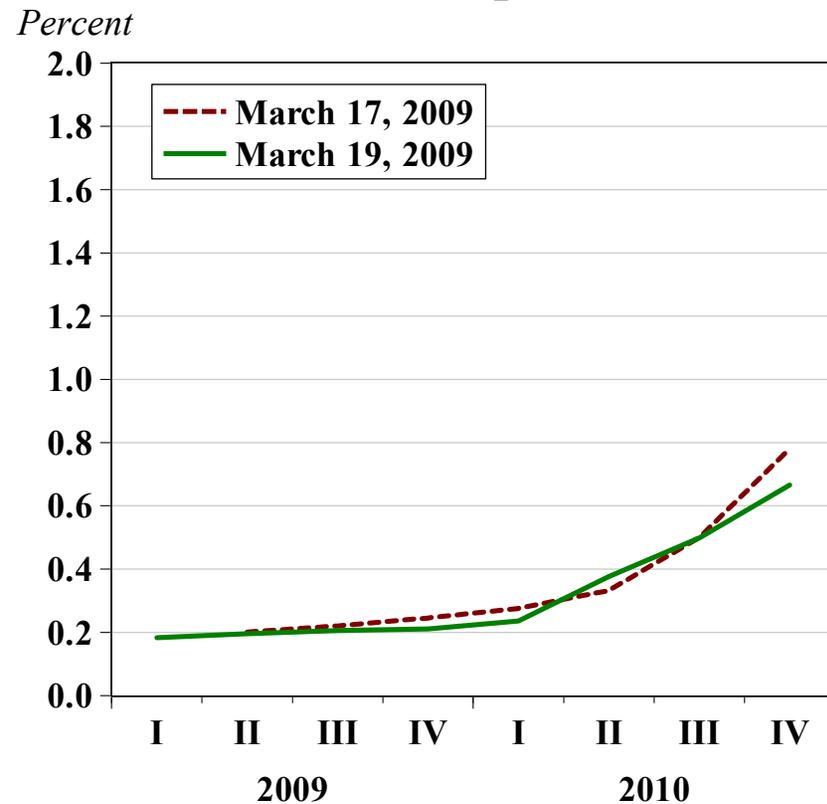
“To provide **greater support to mortgage lending and housing markets**, the Committee decided today...[on] purchasing up to an additional \$750 billion of **agency MBS**, bringing its total purchases...**up to \$1.25 trillion this year**, and to increase its purchases of **agency debt**...by up to \$100 billion to a total of **up to \$200 billion**. Moreover, to help improve conditions in private credit markets, the Committee also decided to purchase **up to \$300 billion of longer-term Treasury securities** over the next six months.” *(FOMC Statement, March 18, 2009)*

Figure 4: Did the March 2009 FOMC Announcement Shift the Expected Path of the Federal Funds Rate?

Blue Chip Consensus Outlook



Market Expectations



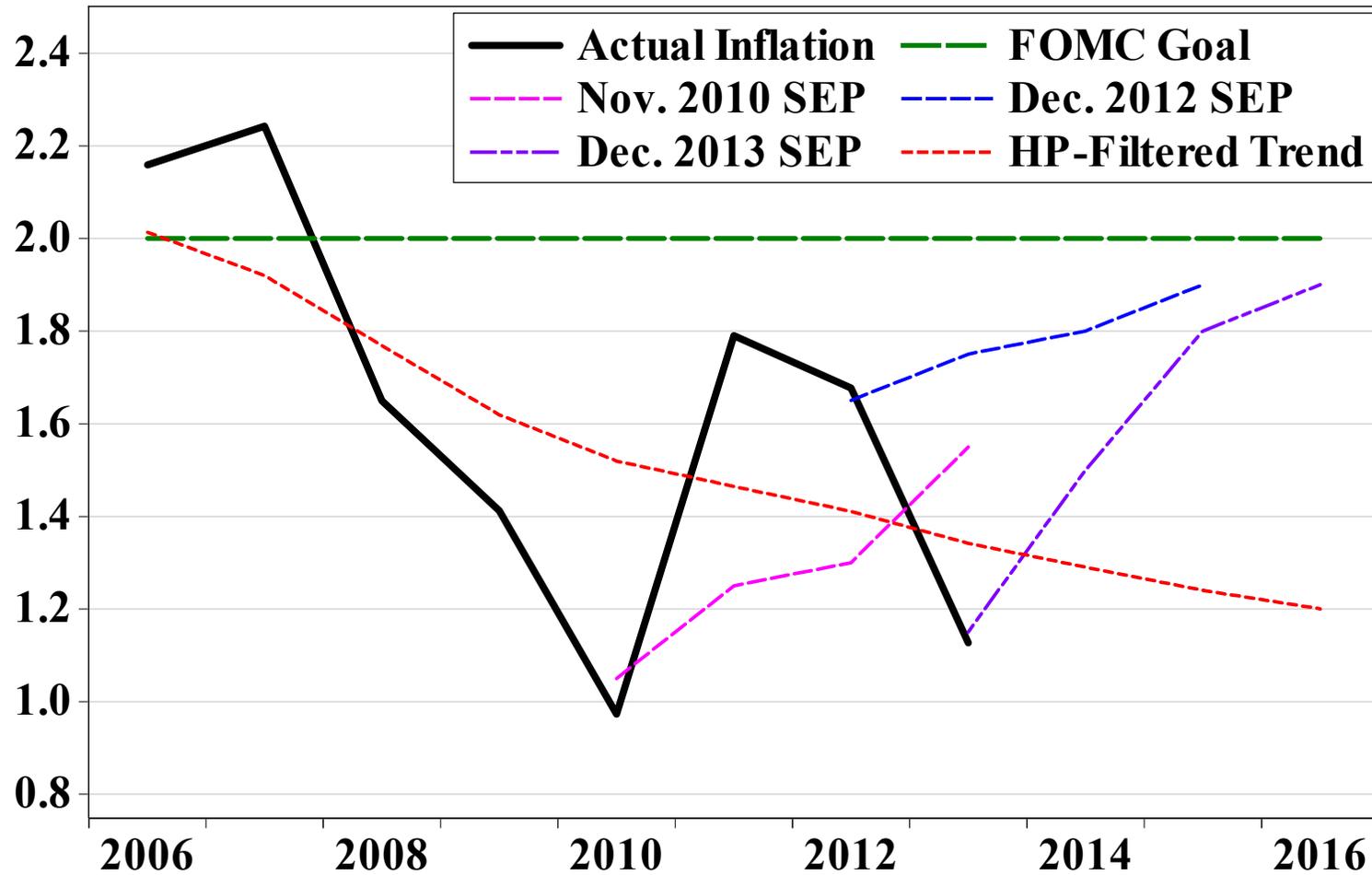
Note: The left panel shows the consensus outlook for the federal funds rate as of March 1, 2009 (dashed line) and April 1, 2009 (solid line); these projections are taken from *Blue Chip Financial Indicators*, a monthly survey owned by Aspen Publishers, Inc. Copyright © 2008, 2009 by Aspen Publishers, Inc. All rights reserved. The right panel shows market expectations computed by staff using price quotes from CME Group on federal funds and Eurodollar future contracts as of March 17, 2009 (dashed line) and March 19, 2009 (solid line).

The Design of the FOMC's QE3 Program

“...the Committee agreed today to increase policy accommodation by **purchasing additional agency mortgage-backed securities** at a pace of **\$40 billion per month**. The Committee also will continue through the end of the year its program to **extend the average maturity of its holdings of [Treasury] securities** as announced in June....These actions, which **together will increase the Committee's holdings of longer-term securities by about \$85 billion each month** through the end of the year, should put downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative. *(FOMC Statement, March 18, 2009)*

The Evolution of the FOMC's Outlook for U.S. Core Consumer Inflation

Percent



Potential Directions for Further Research

- Endogenous government spending
- Effects of QE on the term premium (*via stock and flow channels*)
- Precautionary motives for accumulating a fiscal “war chest” during normal times
- Imperfectly credible commitment mechanisms