How Does Monetary Policy Work When Interest Rates are Zero?

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Monetary Policy as Interest Rate Policy

- Policy instrument is the Federal Funds Rate
- Interest rate rules
- Monetary policy works through real interest rates
- Problems with interest rate rules when rates are zero
- Can monetary policy work through monetary base growth?
- Success of ’quantitative easing’ in Japan controversial
- US Monetary Policy in the 21st century

Interest Rate Rules

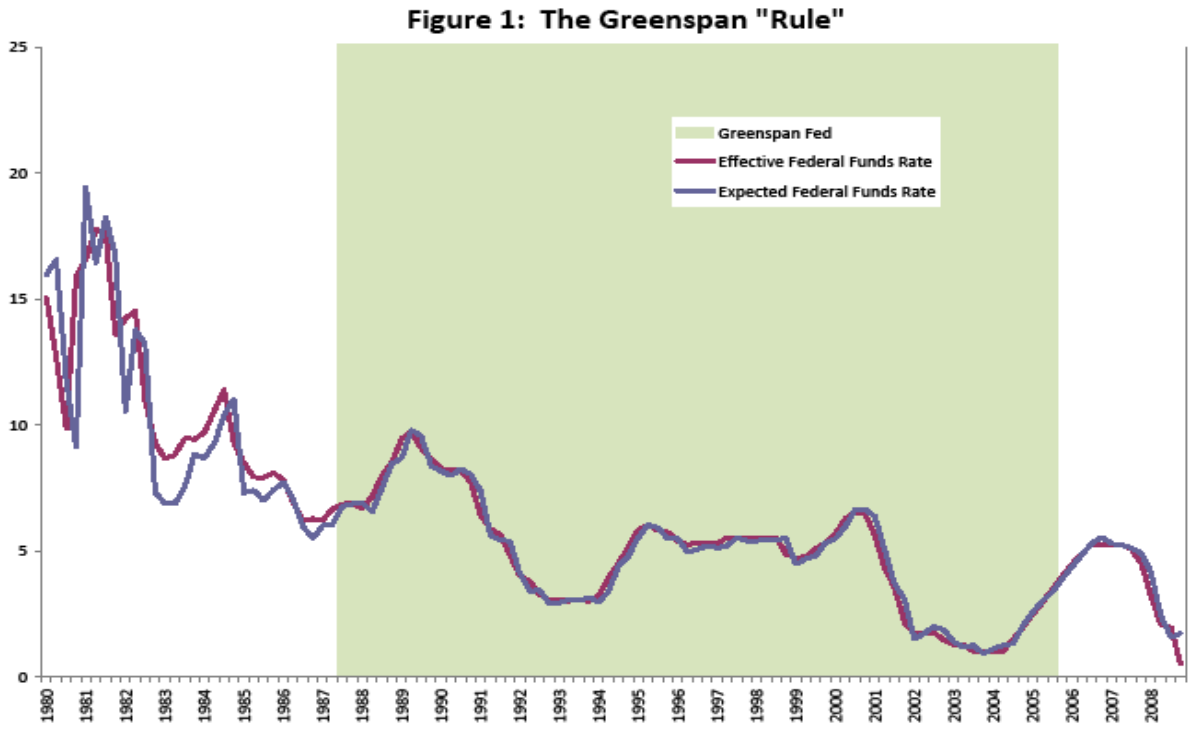
- Taylor Rule
  - FF rate responds to deviations of inflation rate and output growth rate from their respective targets
  - Strong response to inflation rate
  - Muted response to output growth

$$i=1.5\pi+0.5\hat{y}+const$$

- Empirical rule for Greenspan, 1987-2005 (Blinder and Reis, 2005)

$$i_t=0.15\ (7.5+1.6\pi_t-1.4u_t) + 1.5i_{t-1} - 0.6\ i_{t-2} + \varepsilon_t$$

The Greenspan Era, 1987-2005



Interpretation of Interest Rate Rules

- Not to be taken as a mechanical rule, but reflects consistent behavior over time
  - Taylor (2005) emphasizes goodness of fit
    - consistency and predictability of policy actions
  - Blinder and Reis (2005) emphasize periods of deviations
    - response to other information than inflation and unemployment rate
    - discretion

Mistakes Were Made?

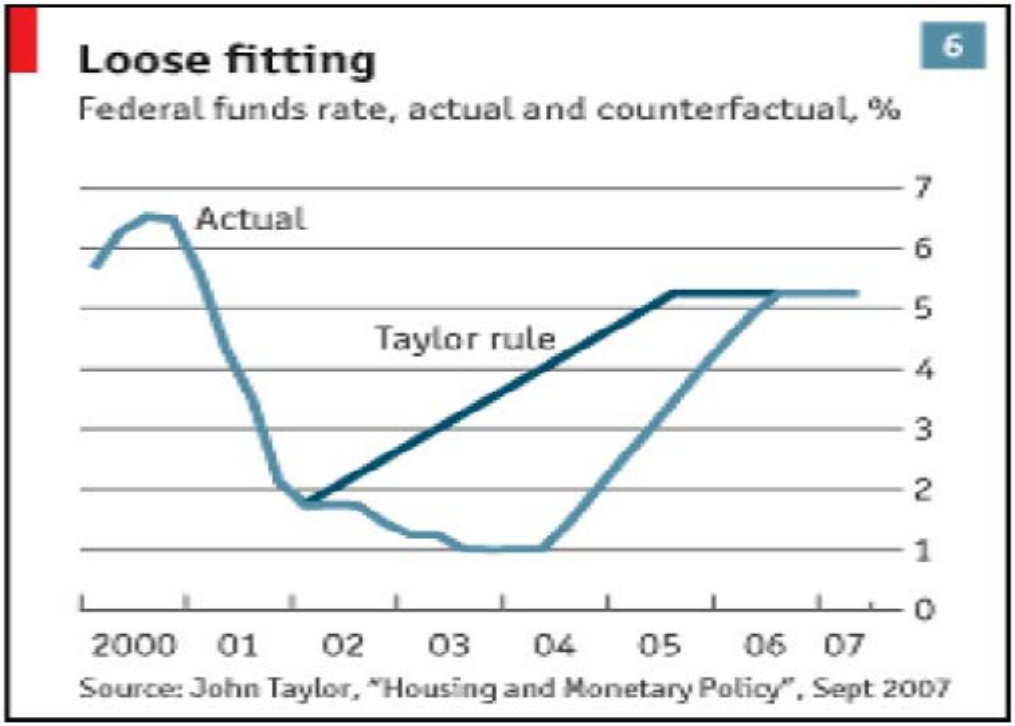


Figure 1. Chart from *The Economist*, October 18, 2007

Monetary Policy is Supposed to Work Through Interest Rates

- Private sector actions depend on the real interest rate

$$r=i-\pi^e$$

- Low real rate encourages consumption and investment
  - Lowers the price of current consumption relative to future consumption
  - Increases the present value of future income from investment
- Nominal interest rate cannot fall below zero
  - With zero nominal interest rate, monetary policy affects economy only through impact on expected inflation

The Problem with Interest Rate Rules when the Interest Rate is Zero

- Interest rates and money demand with positive interest rates

$$i=f(\pi,y) \text{ and } M=P\,L(y,i)$$

- Money demand at a zero interest rate: liquidity trap

$$M/P \geq L(y,0)$$

- The irrelevance of the monetary base in the presence of unchanged interest rate rules, Eggertson and Woodford (2003)

$$M=g(i,.)PL(y,i)$$

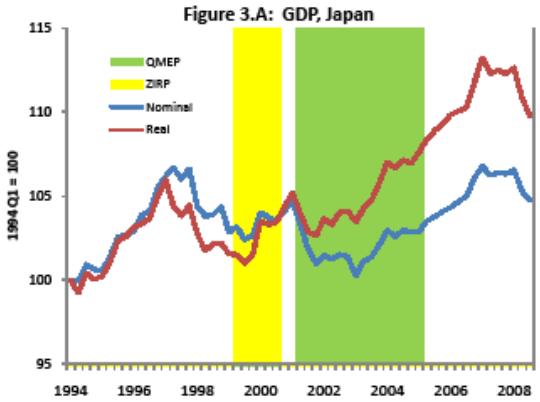
$$\text{with } g(0,.) \geq 1$$

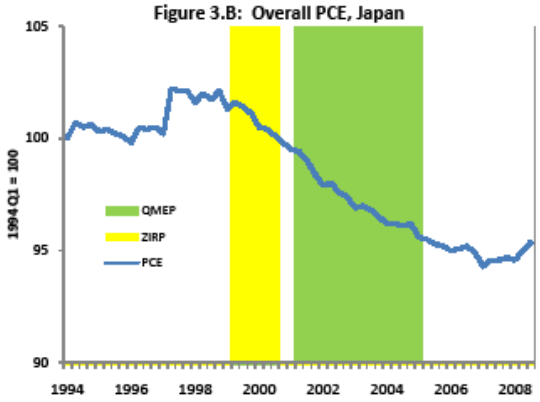
$$\text{and } i=f(\pi,y) \text{ and } g(i,.)=1 \text{ for } i>0$$

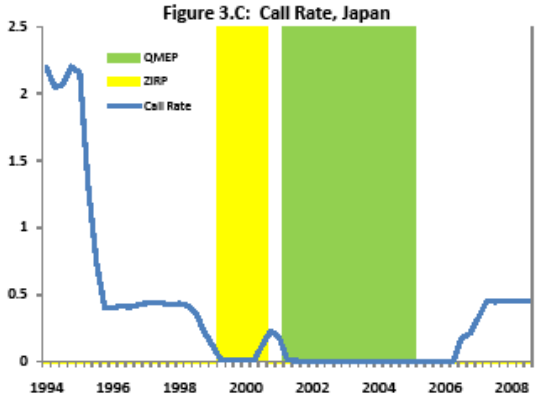
Deflation and Monetary Policy in Japan

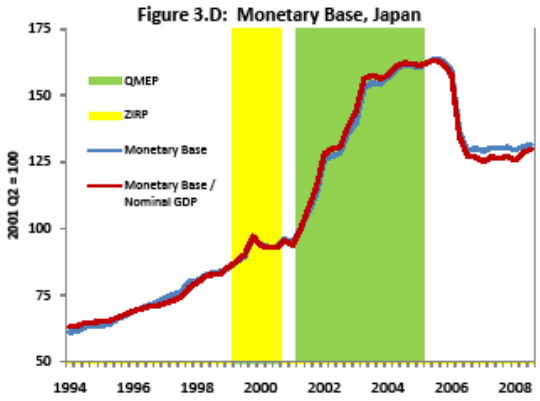
- Zero Interest Rate Policy (ZIRP)
  - “until deflationary concerns are dispelled”
  - April 1999-August 2000
  - The price level declined
- Quantitative Monetary Easing Policy (QMEP)
  - “maintaining an ample liquidity supply” until inflation becomes zero or positive on a sustained basis
  - March 2001-March 2006
  - The monetary base increased by 60 percent over 3 years
  - The price level declined

Japan, 1997-2007









United States, 2003-04 and Today

- Deflation concerns coming out of the 2001-02 recession
  - Concerns about zero lower bound for Fed Funds Rate
  - Keep FF rate low for an “extended period of time”
- Current recessions
  - FF rate at “zero” since 4th quarter 2008
  - Monetary base has increased within 3 months by 60 percent
    - By-product of credit policy
    - Monetary policy through asset side of Federal Reserve balance sheet, not through liability side

United States, 2000-2008

Figure 4.A: GDP, United States

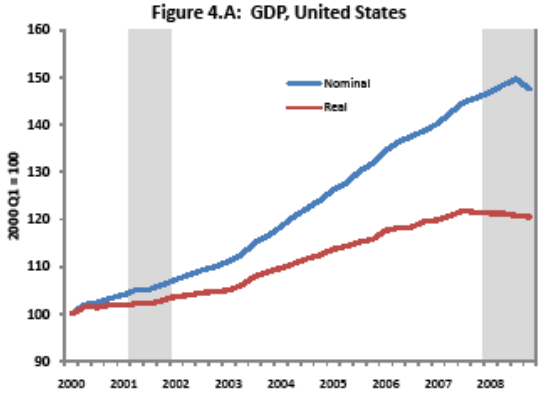


Figure 4.B: Overall PCE, United States

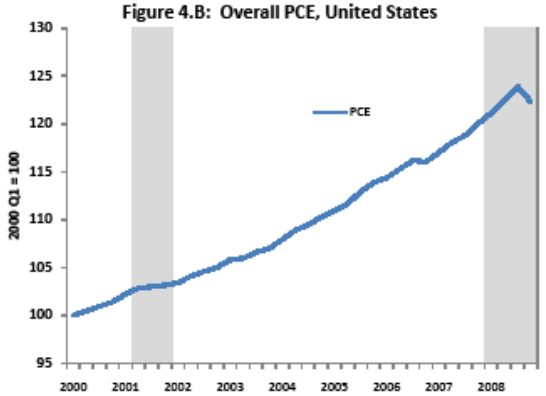


Figure 4.C: Federal Funds Rate, United States

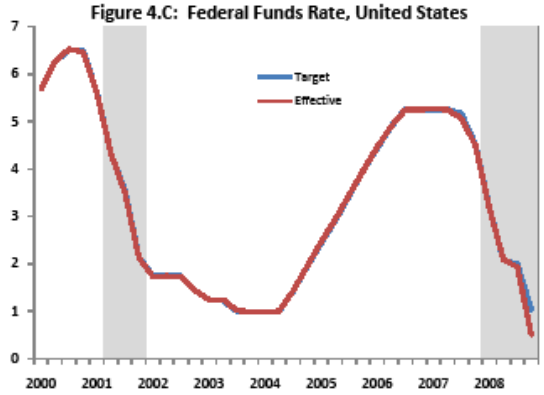
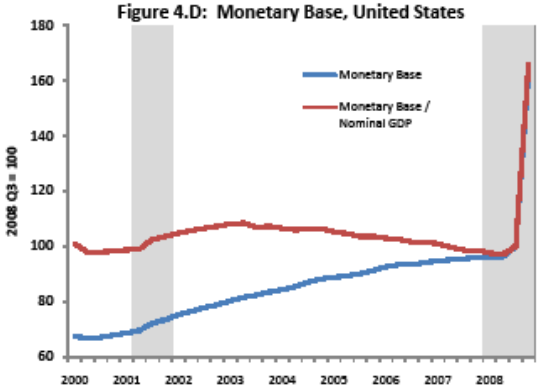


Figure 4.D: Monetary Base, United States



Is Monetary Policy Irrelevant at Zero Interest Rates?

- Empirical issue
  - Maybe Japanese QMEP was not forceful/persistent enough
  - Monetary base expansions were ad hoc, similar to the credit policy the Federal Reserve is pursuing now
- Theory: irrelevance of monetary base expansion depends on some maintained assumptions
  - Immediate reversal to interest rate policy, after interest rates become positive, in particular, monetary base reverts to pre-expansion levels. Feasible?
  - Extended deviation from the standard Fed interest rate rule even after the FF rate has become positive. Meta policy rule?

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