

# 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
- It looks as if policy for FF Rate follows a simple rule
- 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 21<sup>st</sup> century





# Interest Rate Rules

- Taylor Rule (normative): FF rate should respond
  - Strongly to deviations of Inflation rate from the inflation target
  - Weakly to deviations of output growth from long run trend growth

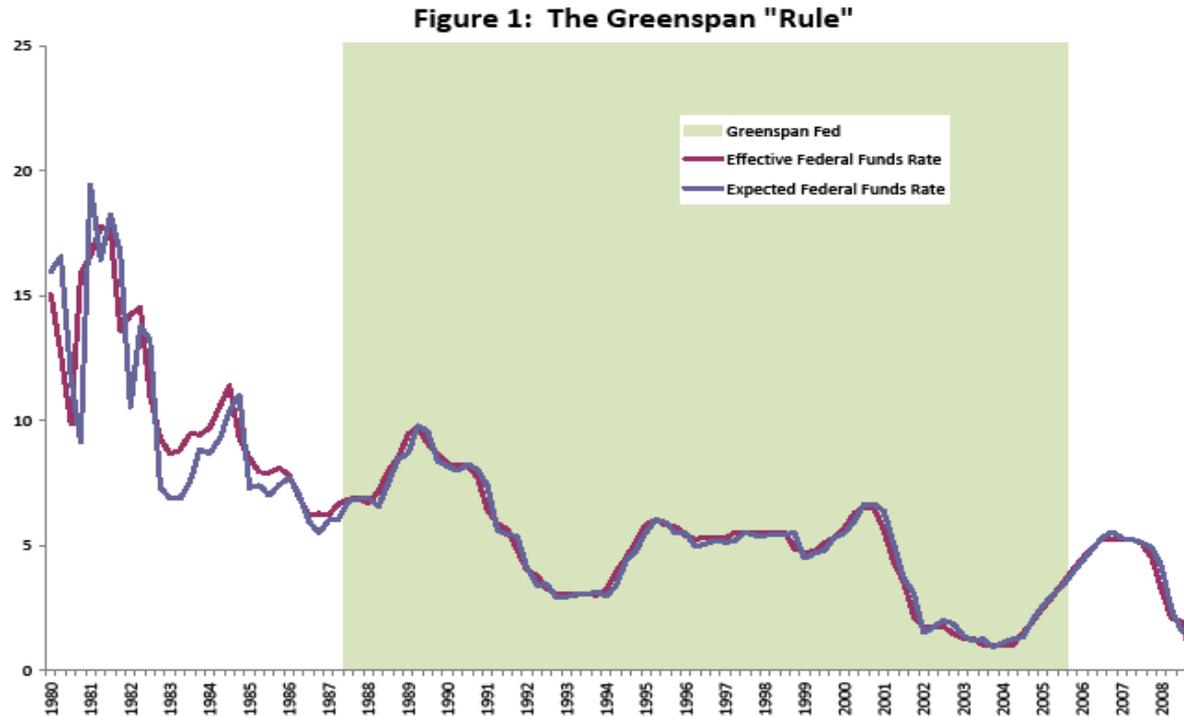
$$i = 1.5\pi + 0.5\hat{y} + \text{const}$$

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

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



# The Greenspan Era, 1987-2005



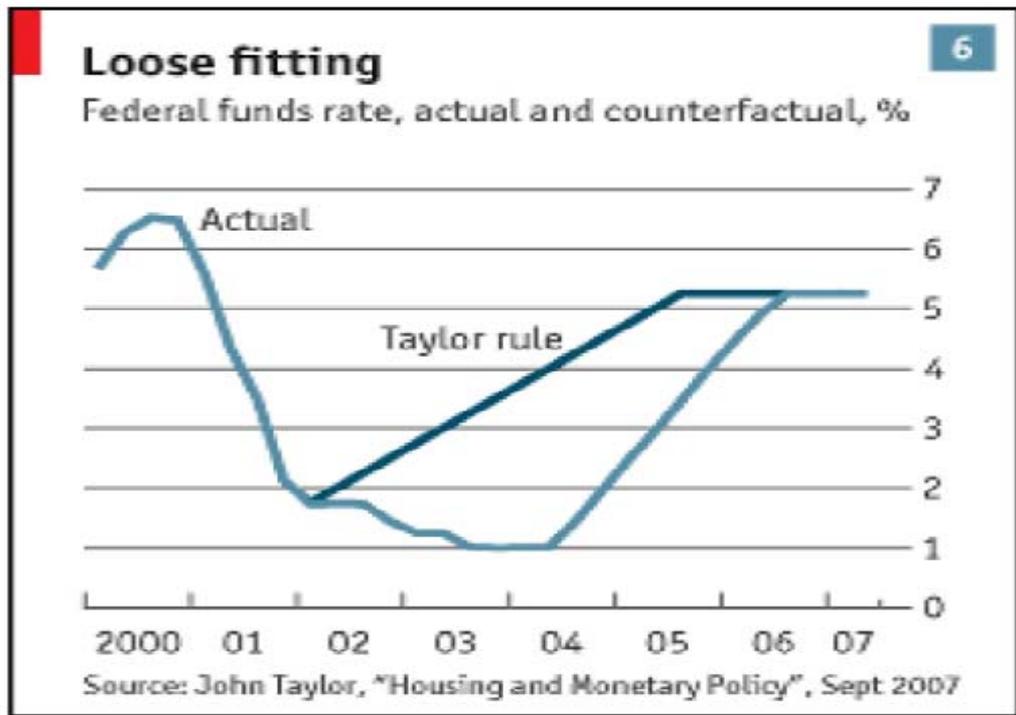


# Interpretation of Interest Rate Rules

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



# 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

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

- Growth of the monetary base when the interest rate is zero,
  - Does not matter if monetary policy reverts to its standard interest rate rule as soon as the rule prescribes positive interest rates, Eggertson and Woodford (2003)
  - Matters if monetary policy postpones the adoption of its standard interest rate rule, Auerbach and Obstfeld (2005)



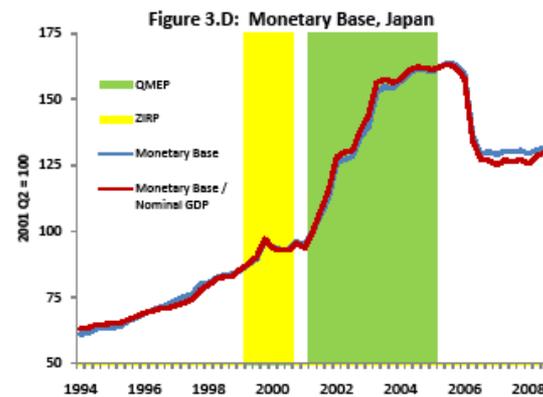
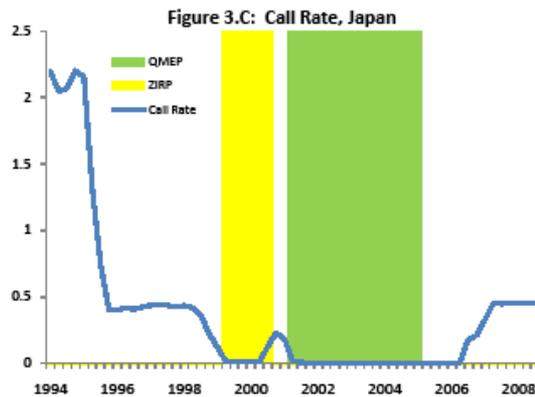
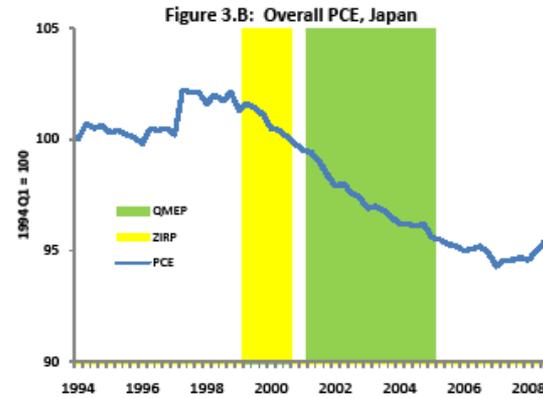
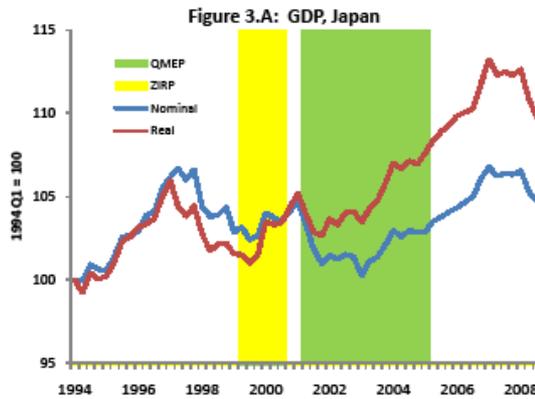


# Deflation and Monetary Policy in Japan

- 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



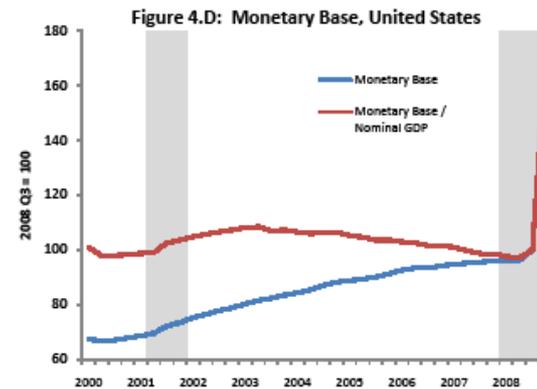
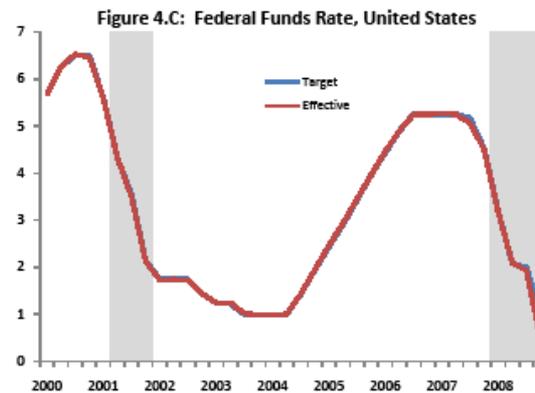
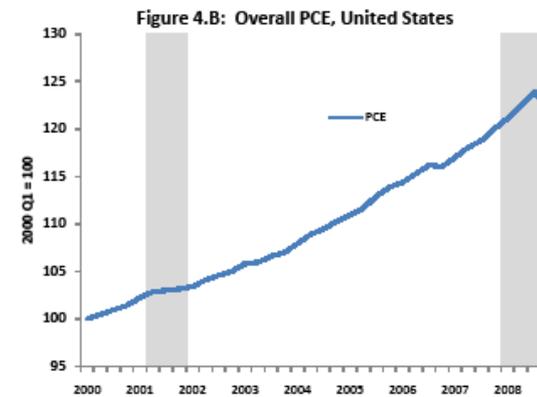
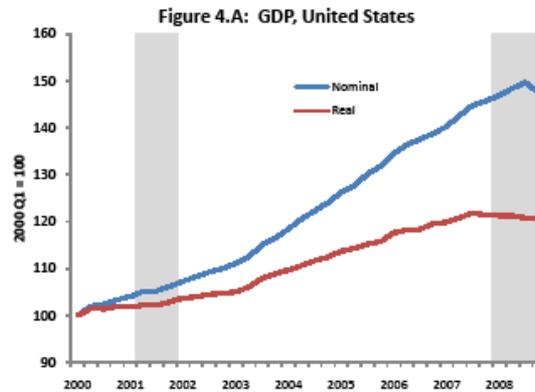


# United States, 2003-04 and Today

- 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 recession
  - FF rate at “zero” since 4<sup>th</sup> 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
    - But recently established program to purchase long-term government bonds



# United States, 2000-2008





# 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 has been pursuing recently
- 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? Explicit inflation target?





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