

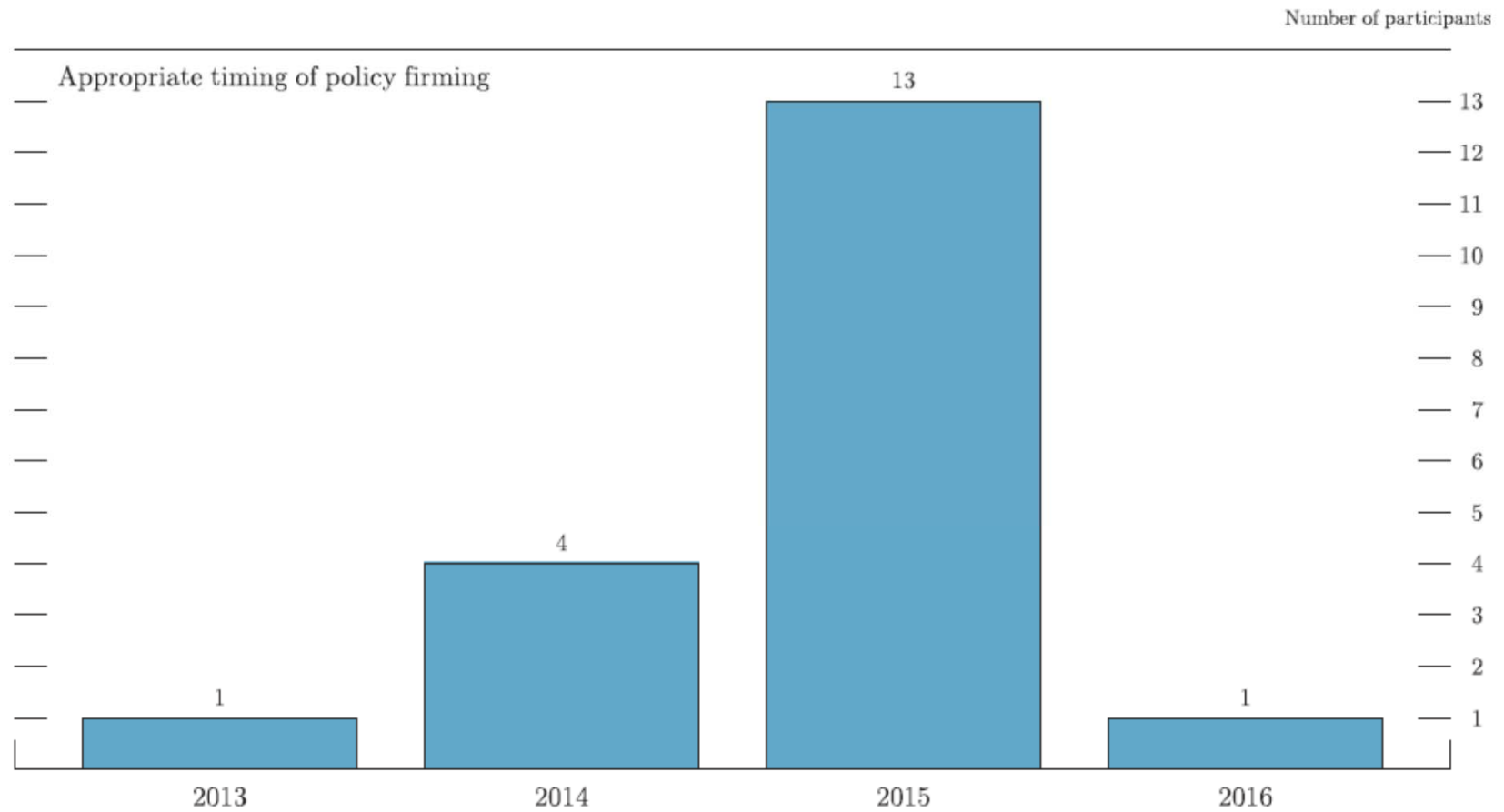
1. Background and Policy Motivation

Start with Most Recent Fed Decisions

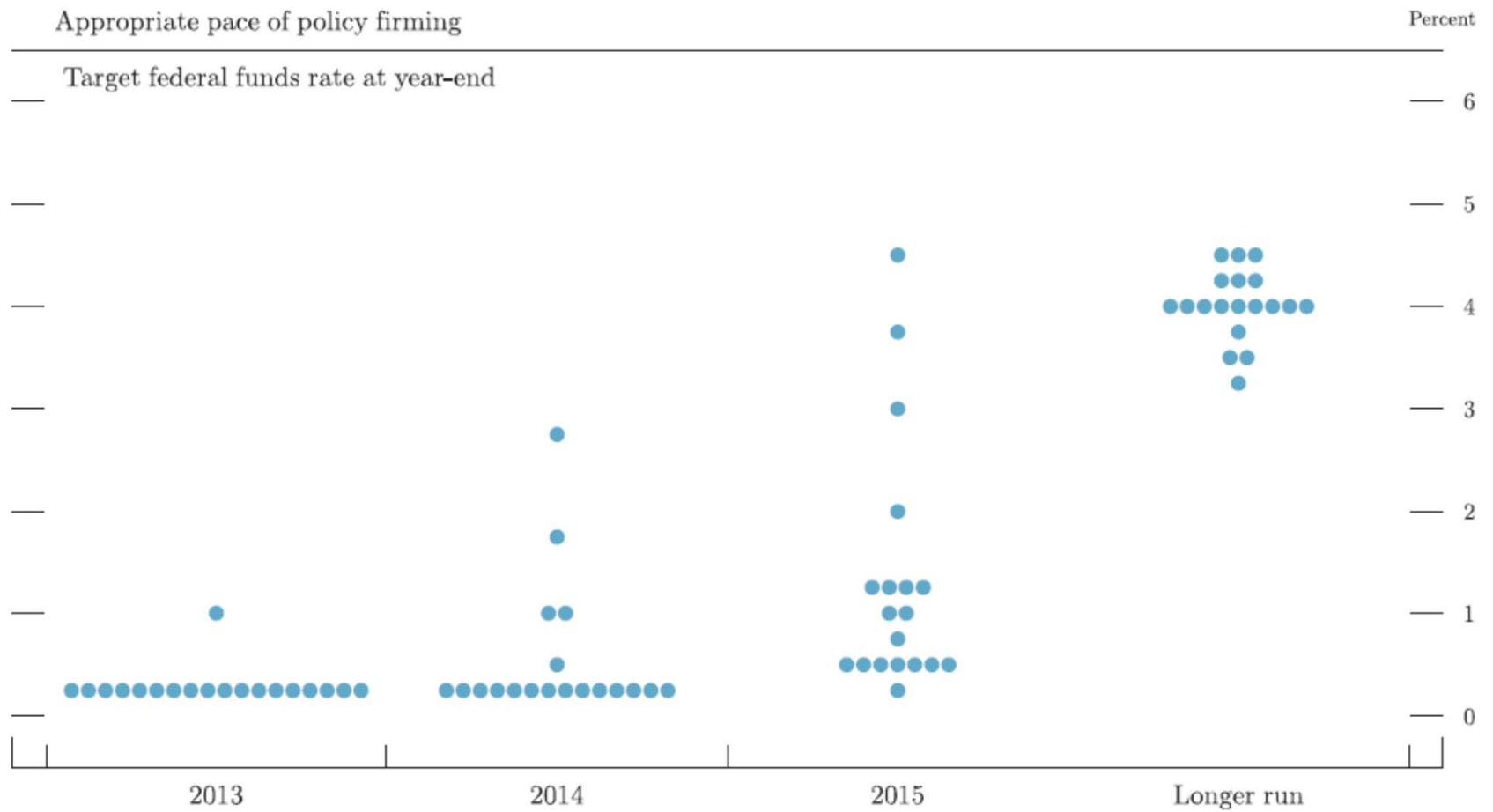
- In its statement of Mar 30, 2013, Federal Open Market Committee...
- “decided to keep the target range for the federal funds rate at 0 to 1/4 percent and currently anticipates that this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6-1/2 percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored.”
- “decided to continue purchasing additional agency mortgage-backed securities at a pace of \$40 billion per month and longer-term Treasury securities at a pace of \$45 billion per month.
 - “will continue...until the outlook for the labor market has improved substantially in a context of price stability.”

March 2013 - FOMC

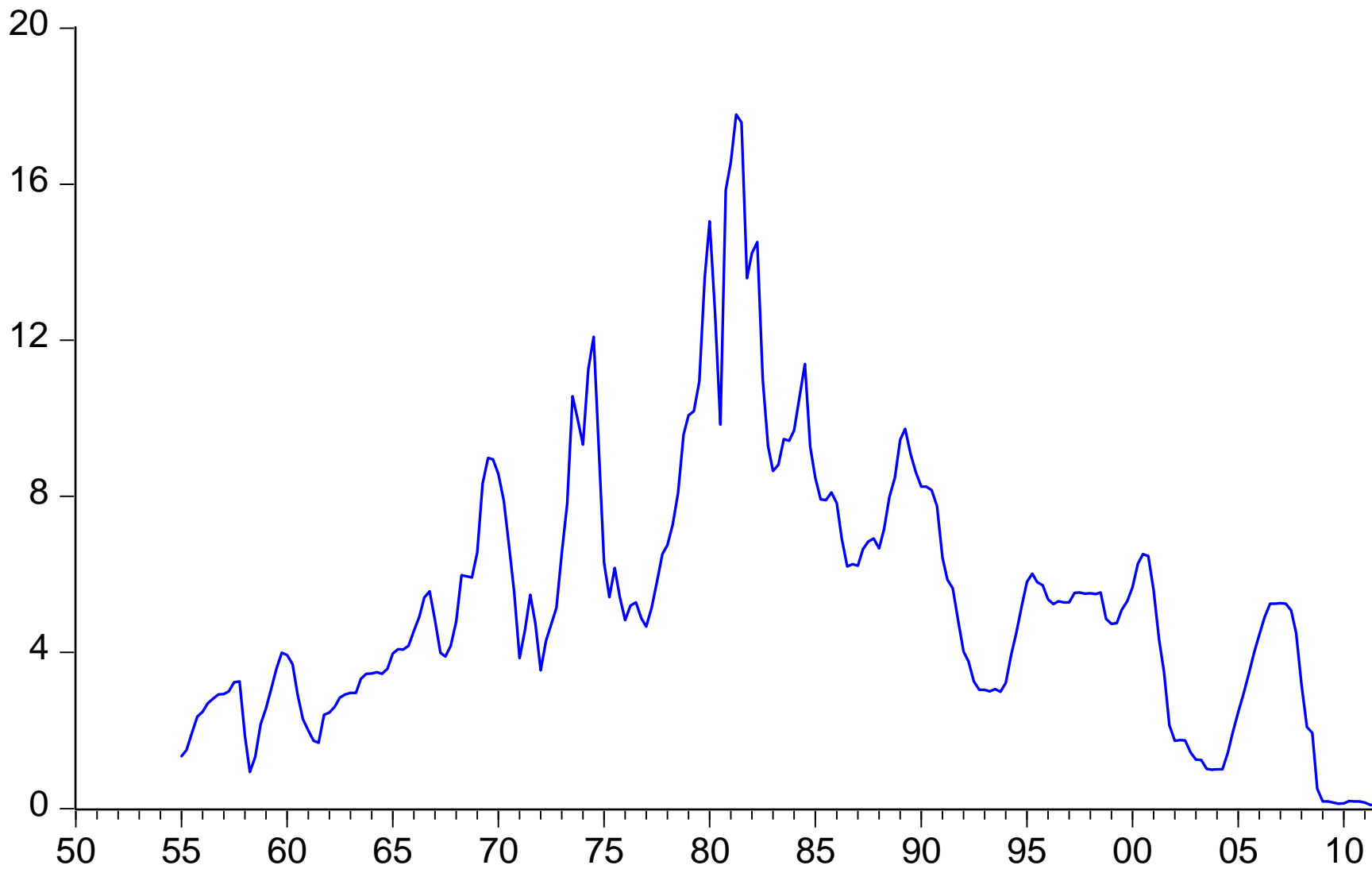
Figure 2. Overview of FOMC participants' assessments of appropriate monetary policy, March 2013



FOMC - March 2013



Percent



Federal funds rate (quarterly averages)

Fed's Balance Sheet (simplest version): Apr 26, 2012

Assets	Liabilities
Domestic Credit (DC) = \$2,717 B	Currency (CU) = \$1,386 B
Foreign Reserves (FR) = \$193 B	Reserve Balances (RB) = \$1,524 B

Currency market
intervention and
exchange rates

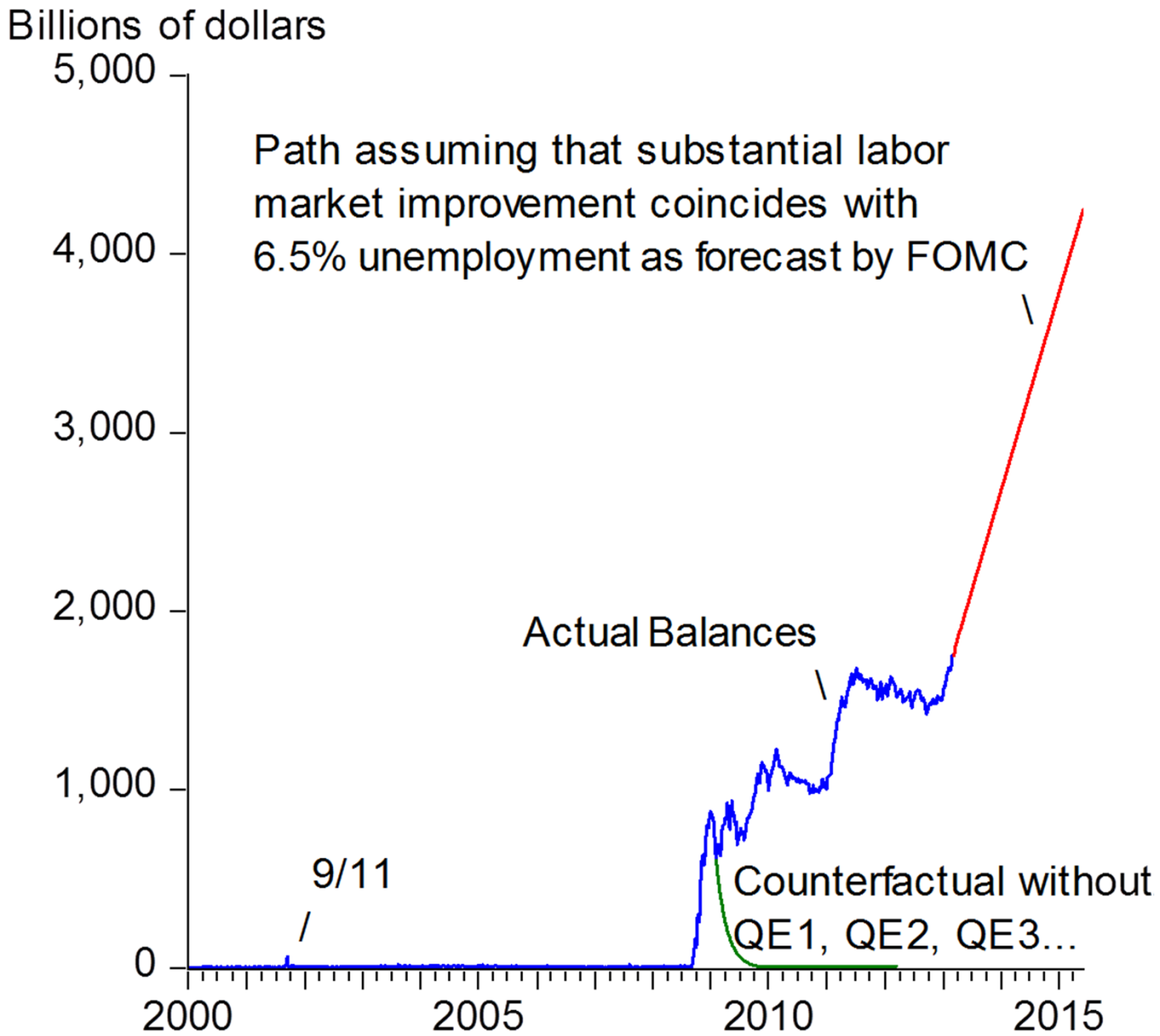
Monetary Base (MB) = CU + RB
Money supply (M) = CU + DD
If $k = CU/DD$ and $r = RB/DD$ were
constant then
 $M = (1+k)DD$
 $MB = (k+r)DD$
 $M = [(1+k)/(k+r)]MB$

Fed's Balance Sheet (simplest version): Aug 28, 2008

Assets	Liabilities
Domestic Credit (DC) = \$844 B	Currency (CU) = \$932 B
Foreign Reserves (FR) = \$100 B	Reserve Balances (RB) = \$12 B

Currency market
intervention and
exchange rates

Monetary Base (MB) = CU + RB
Money supply (M) = CU + DD
If $k=CU/DD$ and $r=RB/DD$ were
constant then
 $M = (1+k)DD$
 $MB = (k+r)DD$
 $M = [(1+k)/(k+r)]MB$



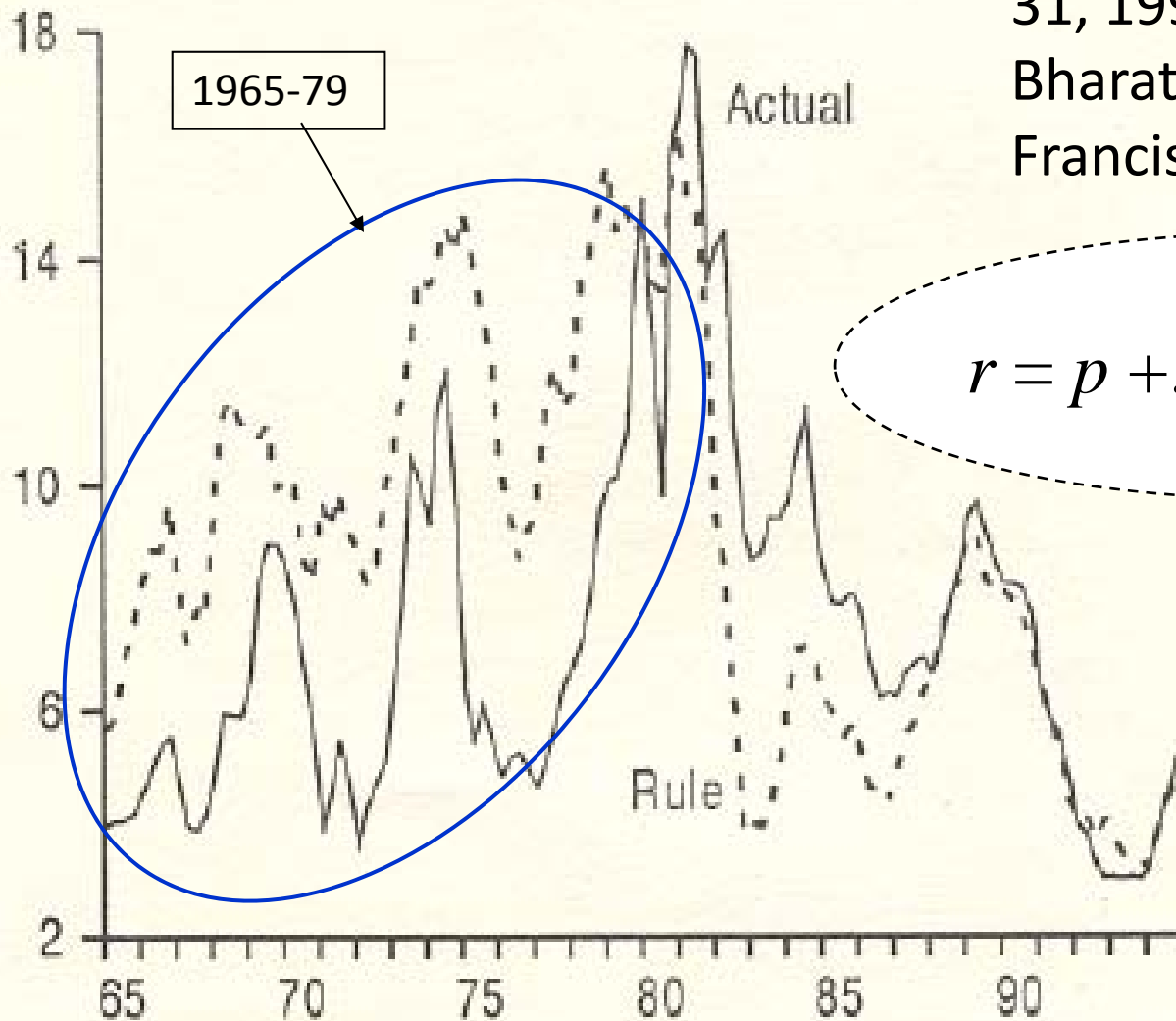
Banks' Reserve Balances at the Fed

Role of Economic Theory in Monetary Policy Analysis

- Long history
 - Gold Standard
 - Milton Friedman's Constant Growth Rate Rule
 - Rules versus discretion
- Revolution came with RE/sticky price models and new analytical techniques
 - Searching for good rules defined the research
 - exploded in 1980s, 1990s, 2000s
 - Taylor rule (1992)
 - Woodford (2003, Ch. 1) "The Return of Policy Rules"
 - Applied in practice, performance improved!
- But then crisis, slow recovery, now new debate
 - Rules versus discretion again
 - Centennial Monetary Commission (April 18 JEC hearing)

1965-1980: monetary policy not well described by good rules-based policy

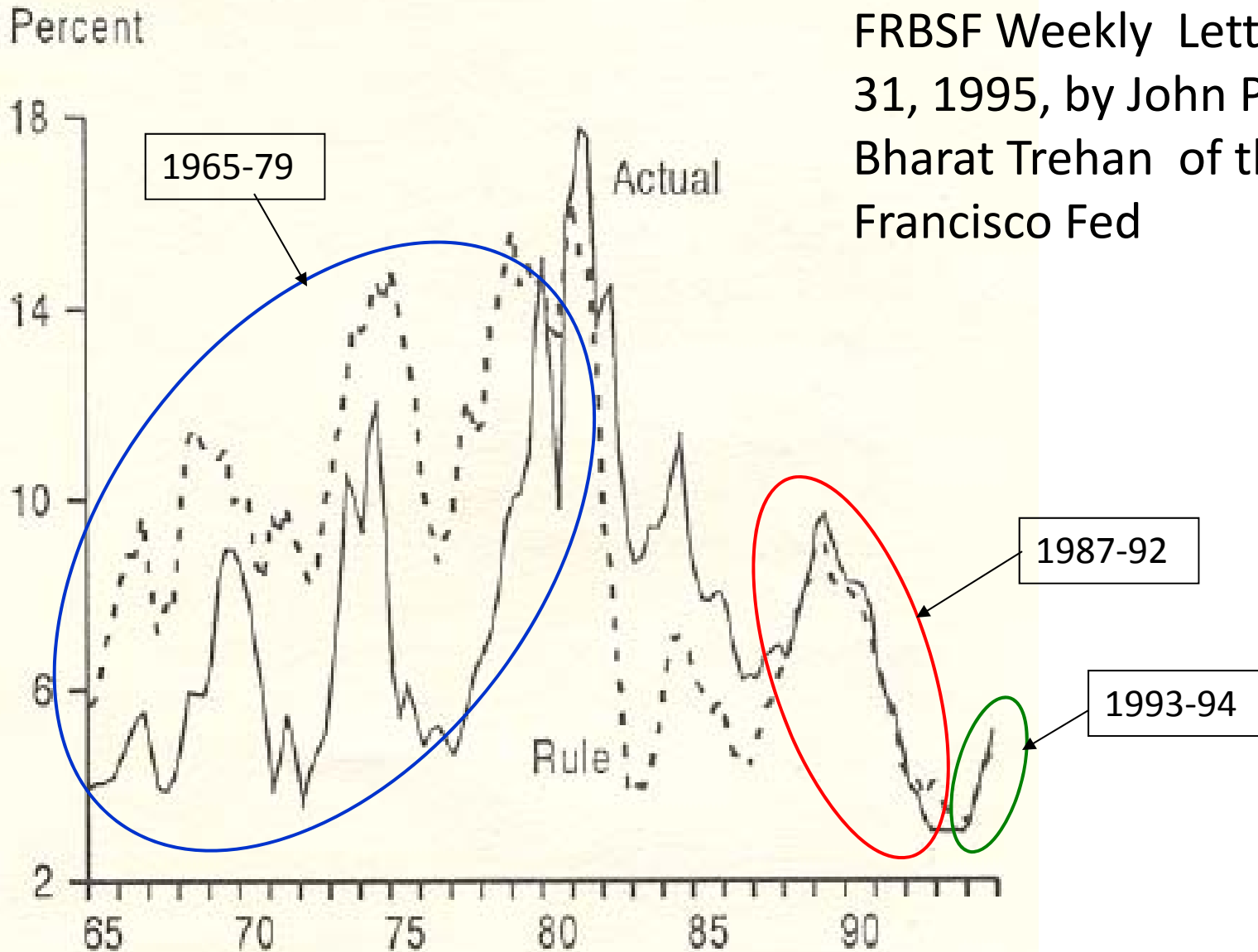
From "Has the Fed Gotten Tougher on Inflation?" The FRBSF Weekly Letter, March 31, 1995, by John P Judd and Bharat Trehan of the San Francisco Fed



$$r = p + .5y + .5(p-2) + 2$$

Monetary policy gets more rules-based

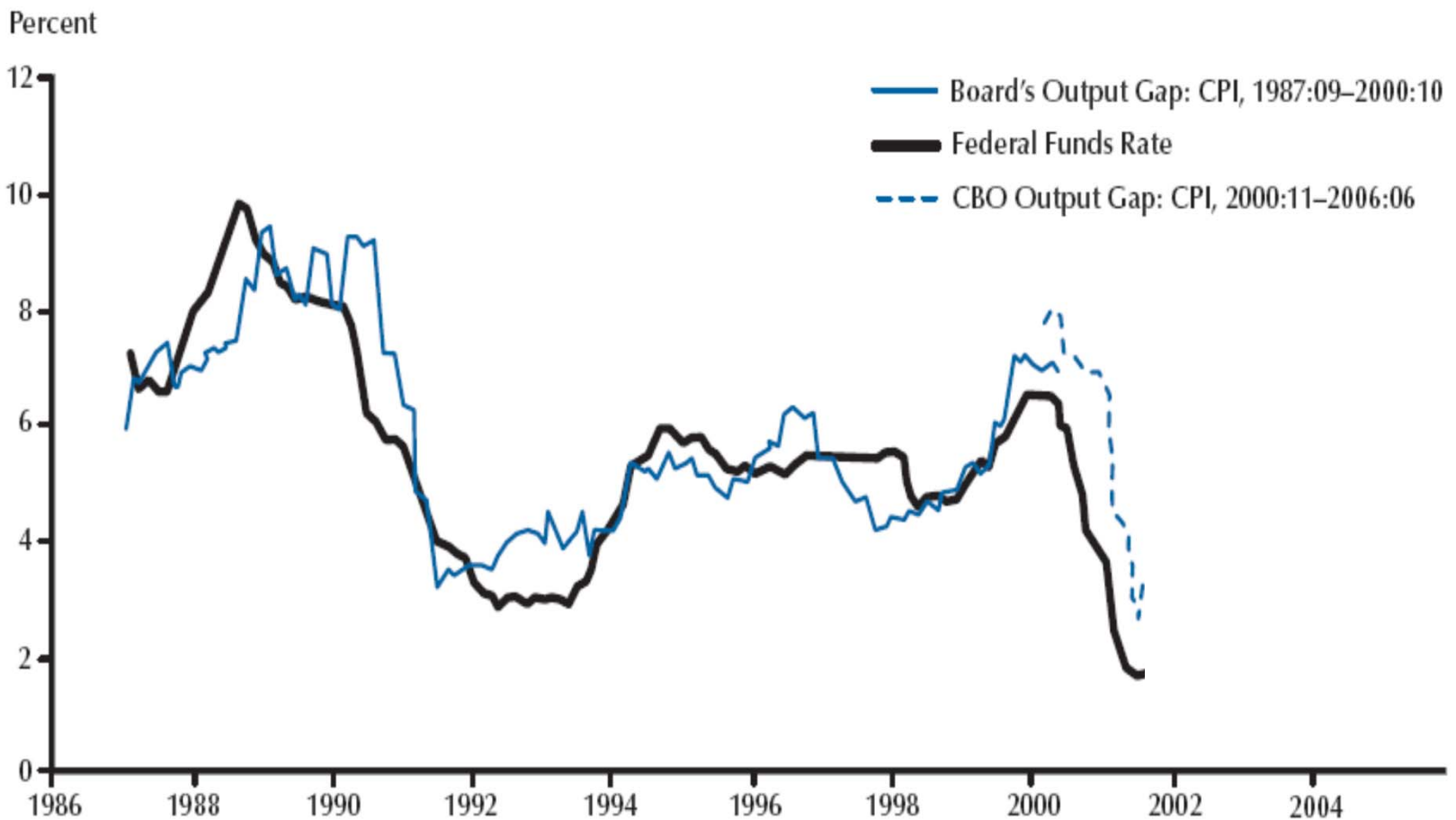
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Illustrative monetary policy chart from St Louis Fed February 2007, Bill Poole (former president)

Greenspan Years: Federal Funds Rate and Taylor Rule

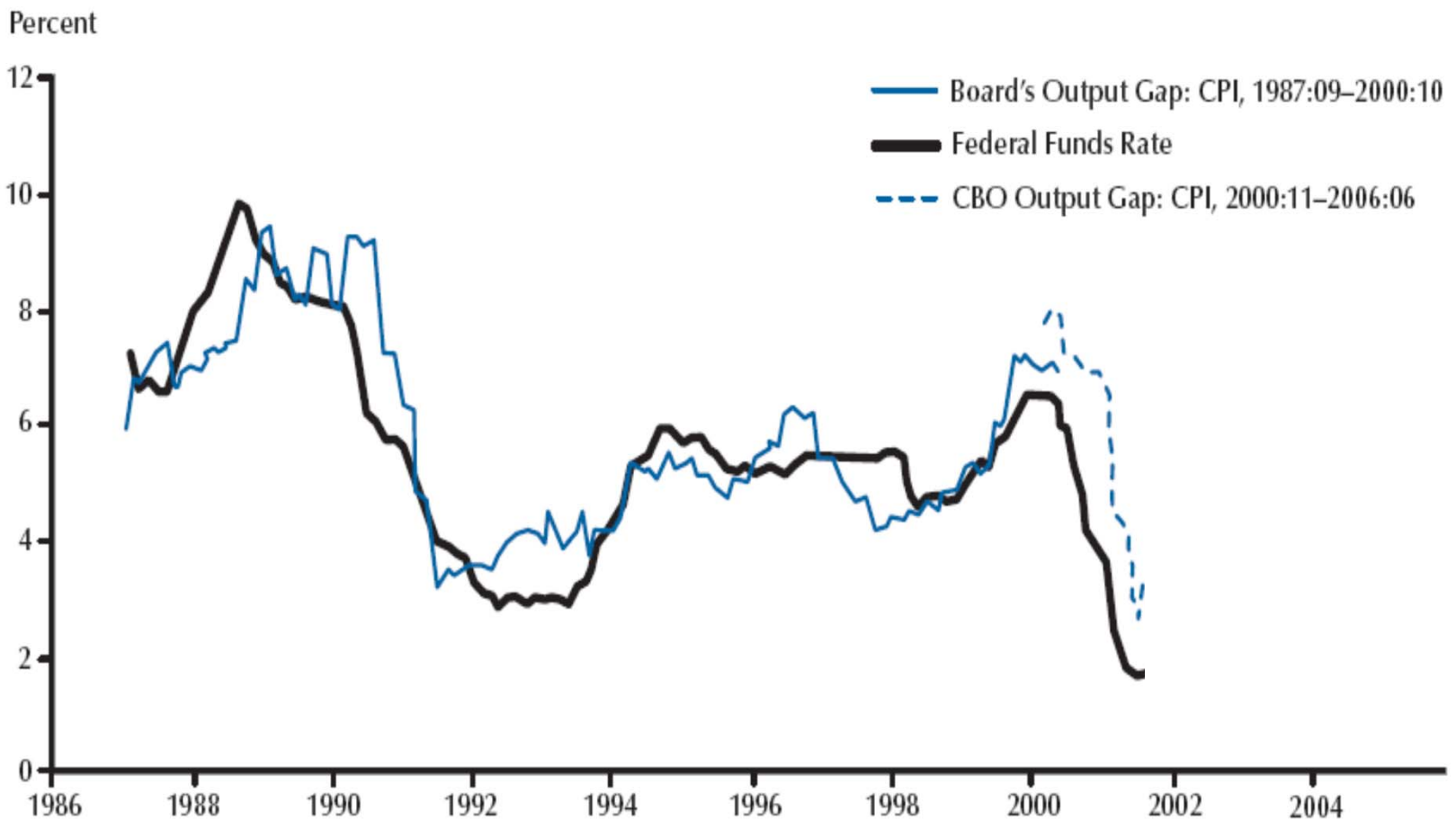
(CPI $p^* = 2.0$, $r^* = 2.0$) $a = 1.5$, $b = 0.5$



Illustrative monetary policy chart from St Louis Fed February 2007, Bill Poole (former president)

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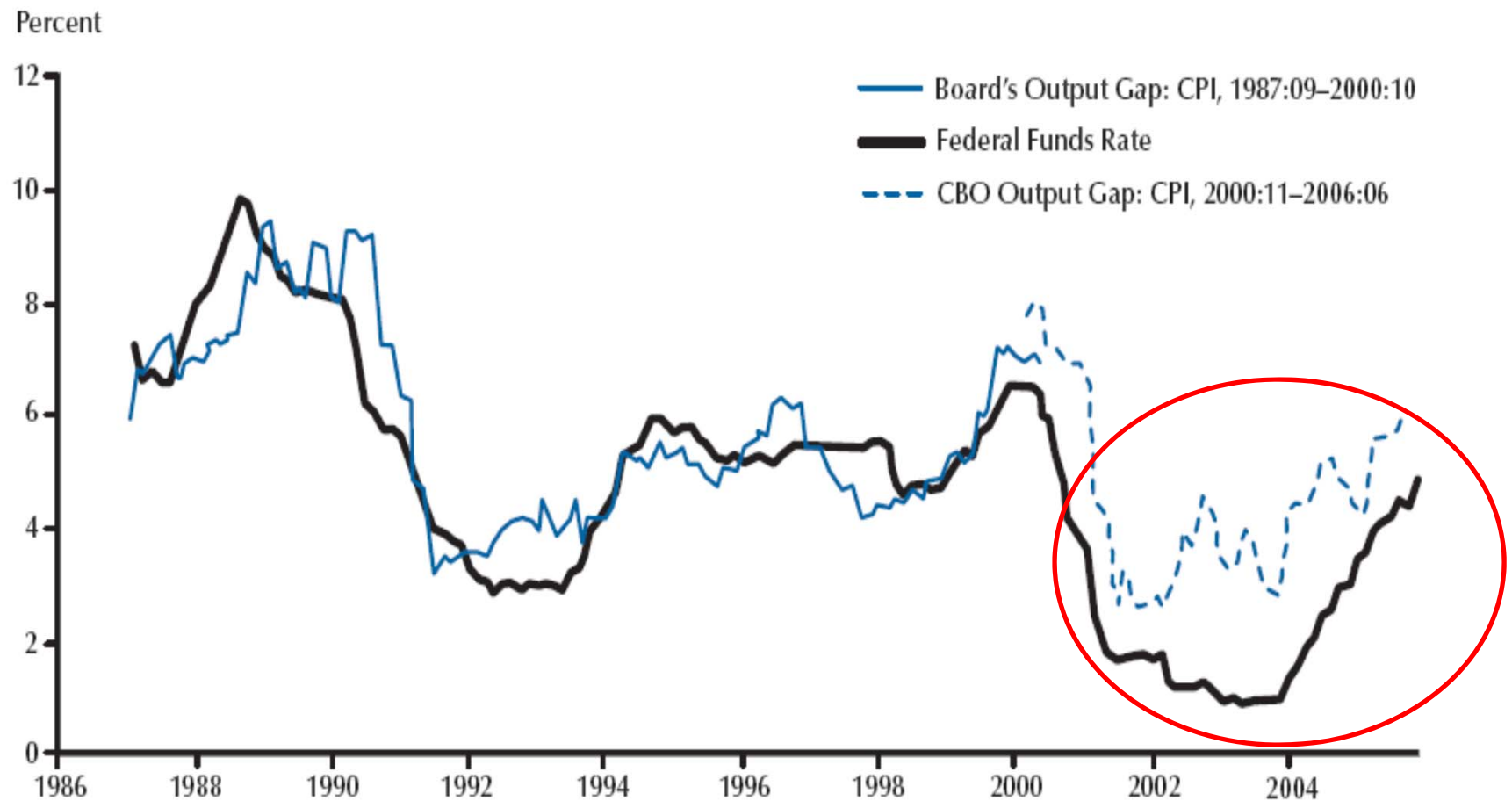
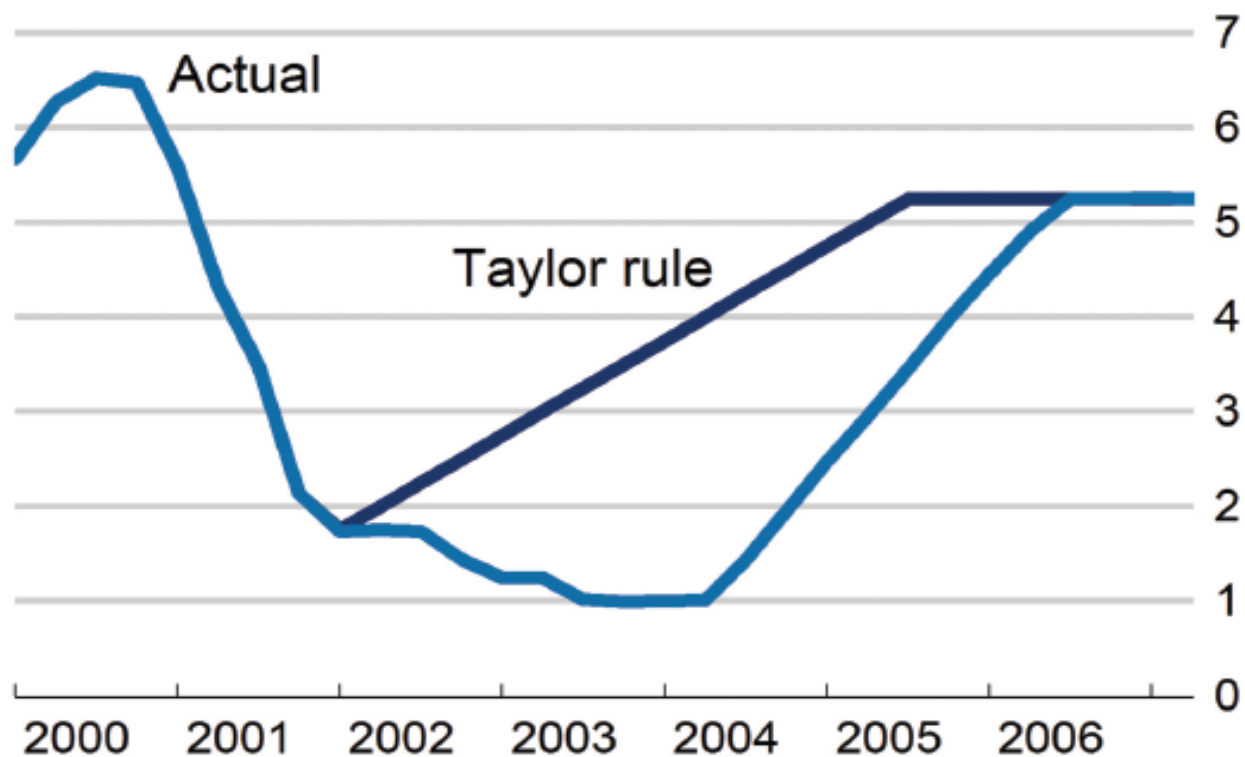


Chart from *The Economist*, October 18, 2007

Loose fitting

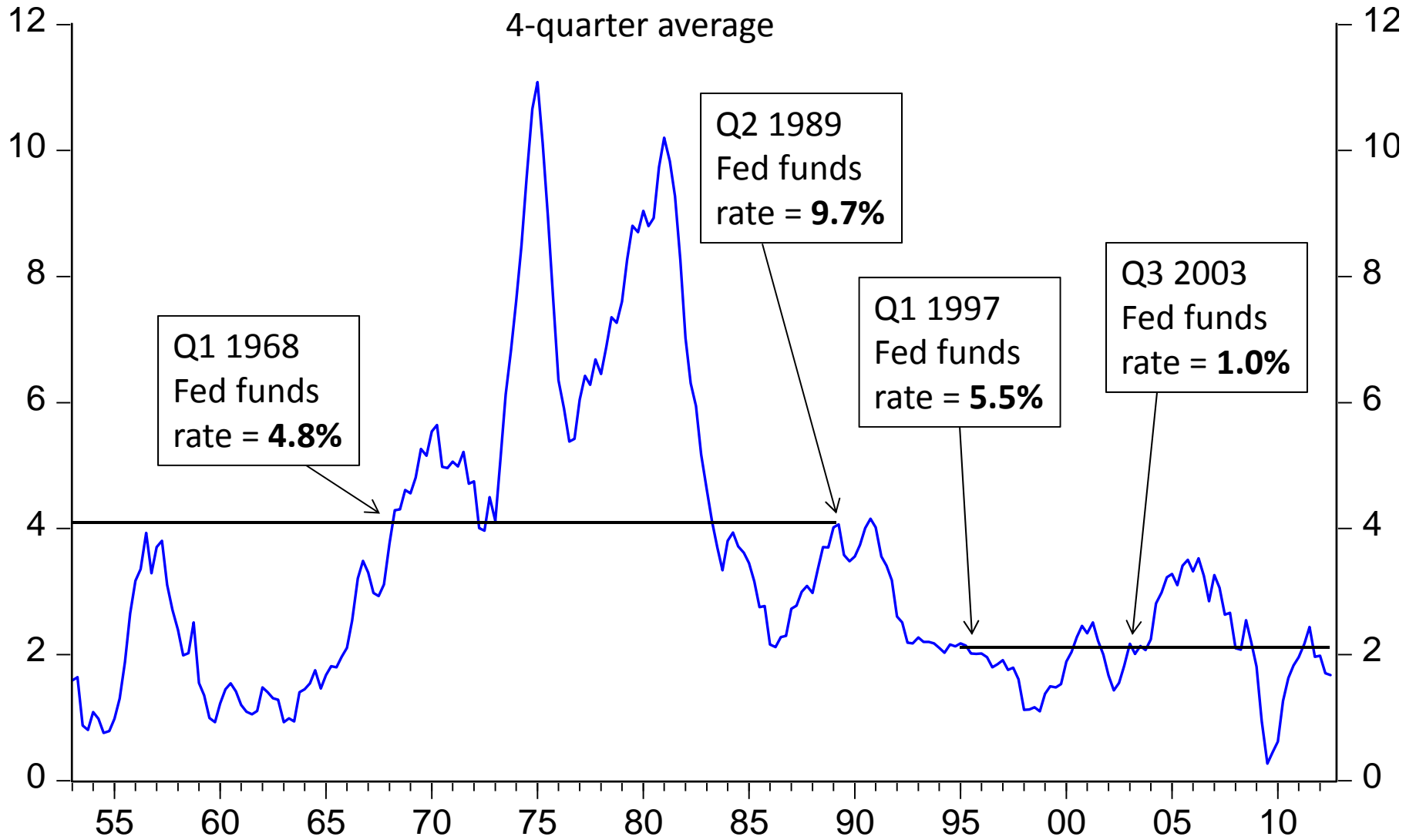
Federal funds rate, actual and counterfactual, (in percent)



U.S. Inflation

4-quarter average

Percent

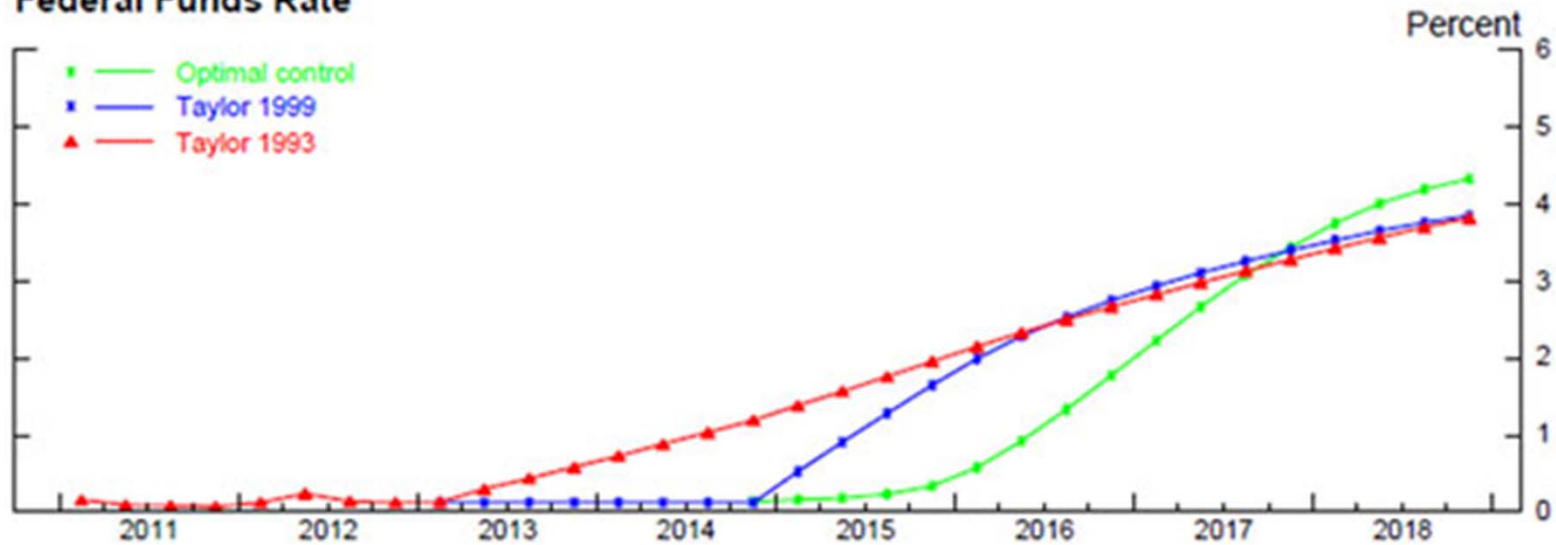


From Fed Vice Chair Janet Yellen- April 2012

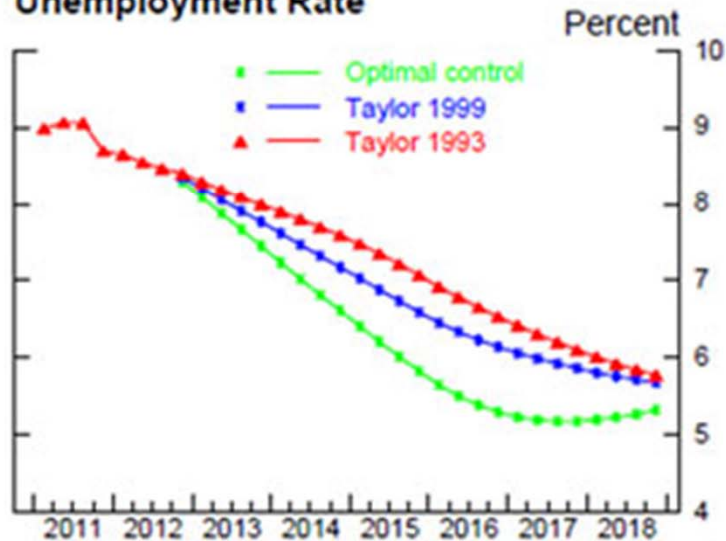
In these simulations, the Taylor (1993) rule is defined as $R_t = 2 + \pi_t + 0.5(\pi_t - 2) + 0.5Y_t$, while the Taylor (1999) rule is defined as $R_t = 2 + \pi_t + 0.5(\pi_t - 2) + 1.0Y_t$. In these expressions, R is the federal funds rate, π is the percent change in the headline PCE price index from four quarters earlier, and Y is the output gap. The output gap in turn is approximated using Okun's law; specifically, $Y_t = 2.3(5.6 - U_t)$, where 2.3 is the estimated value of the Okun's law coefficient and 5.6 is the assumed value of the non-accelerating inflation rate of unemployment, or NAIRU

Figure 8--Simple Policy Rules (Yellen, Apr 2012)

Federal Funds Rate



Unemployment Rate



PCE Inflation

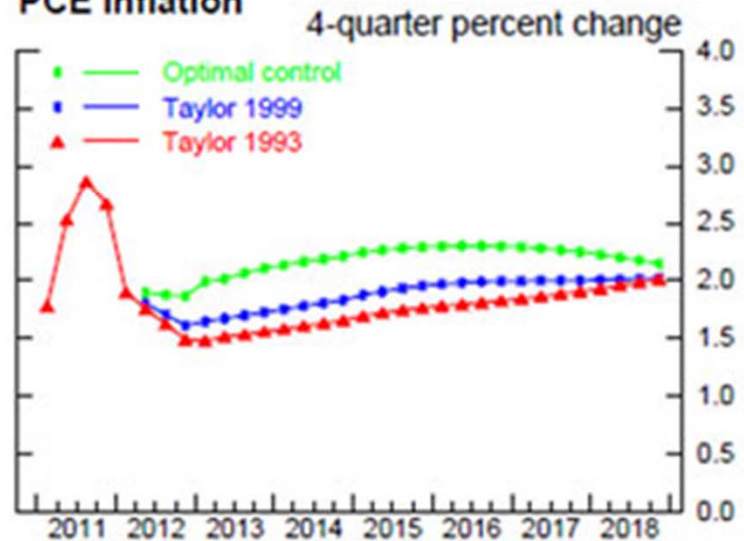
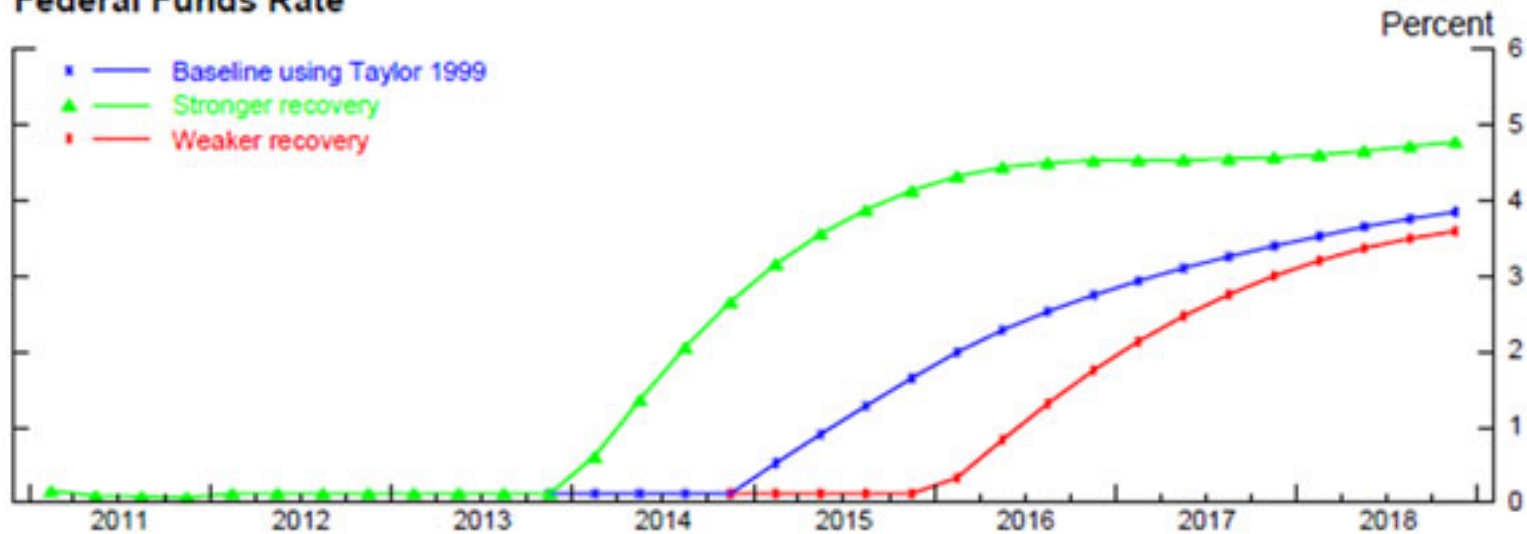
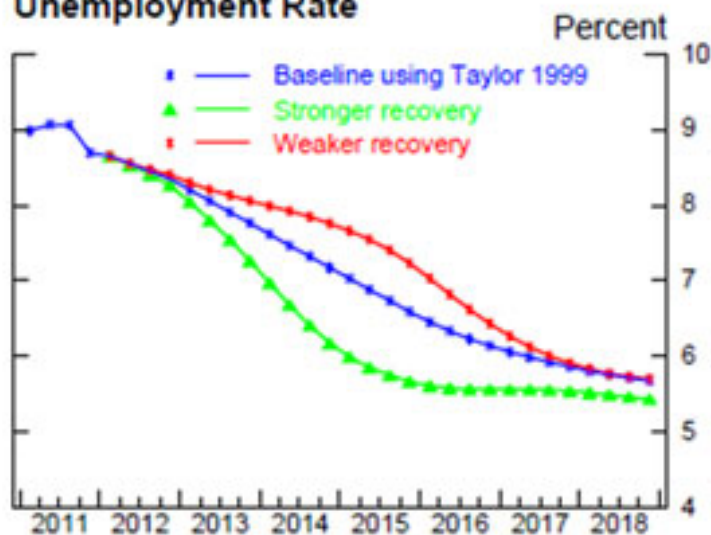


Figure 9--Uncertainty and Policy Conditionality

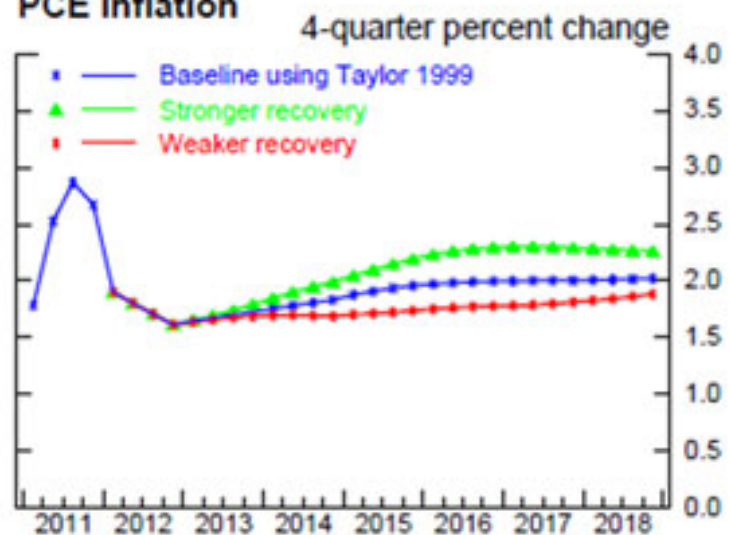
Federal Funds Rate

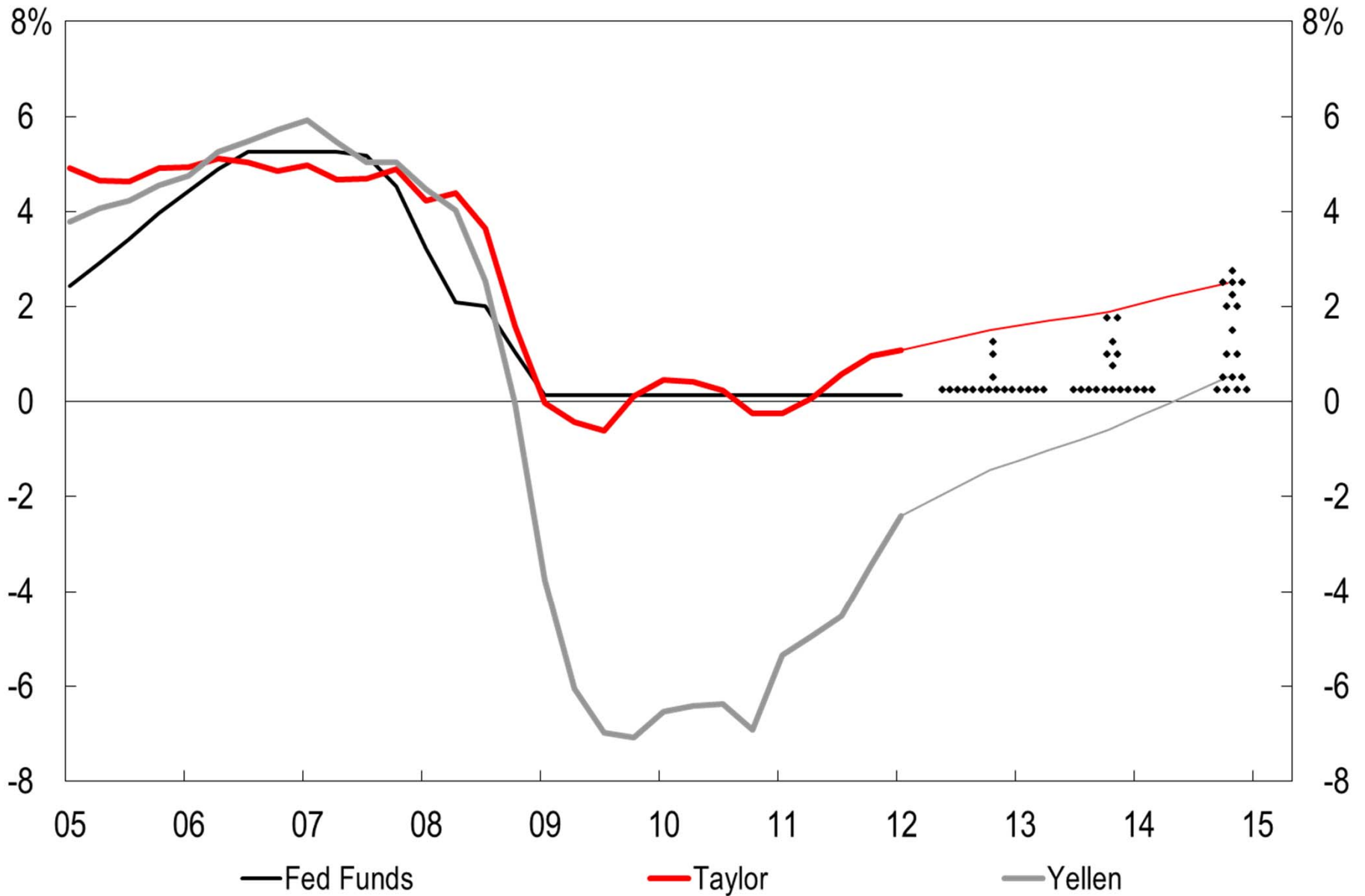


Unemployment Rate



PCE Inflation





Source: Robert DiClemente, Citigroup, April 27, 2012

Fed transcripts (Jan 2002) show importance of monetary theory

- Goal – estimate the effect on average economic performance of lowering the target rate of inflation (which makes the zero bound more of a constraint on policy)
- Approach – simulate the FRB/US model under rational expectations, subject to shocks like those experienced over the past 35 years
- Policy assumption – the Taylor rule
 - ▶ $I_t = R^*_t + \pi_t + .5 \text{ GAP}_t + .5 (\pi_t - \pi^*)$

Economic Performance Under Rules With Alternative Degrees of Responsiveness ¹

	Core CPI inflation target		
	0	2	4
<i>Standard deviation of the unemployment rate (percent)</i>			
1. Taylor rule	1.8	1.5	1.4
2. More responsive rule	1.3	1.1	1.1
<i>Frequency of deep recessions (number per 100 years)</i>			
3. Taylor rule	5.2	4.6	4.4
4. More responsive rule	3.1	2.6	2.3

1. Output gap coefficient equals 1.0 in the more responsive rule, 0.5 in the Taylor rule.

So What's Next?

- To address the monetary policy issue we need to consider monetary models
- Models should be based on economic theory, and they have to be empirical
 - Size of coefficients is crucial
- So start looking at the monetary data which the theory must be able to explain