

Economics 435  
The Financial System  
(3/24)

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UW Madison  
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# Outline

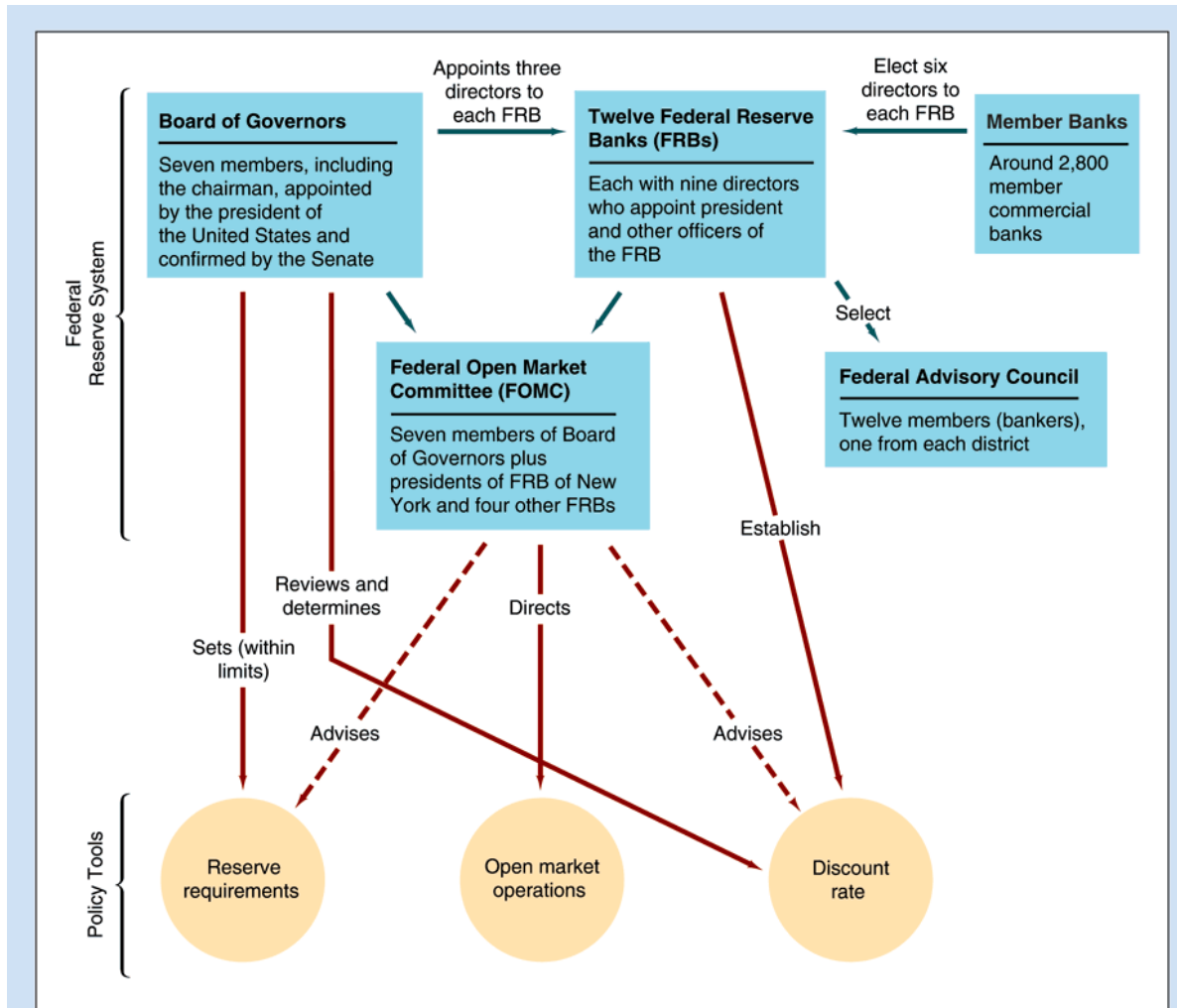
- Where does a central bank fit in the economy?
- What is the Fed? What is the ECB?
- IS-LM: Textbook monetary policy (pre-2008)
- IS-LM: monetary policy in practice (pre-2008)
- The Taylor Rule
- Problems in implementation

# Central Banks in the Financial System

**TABLE 14.1 FINANCIAL RELATIONSHIPS (BALANCE SHEETS) BETWEEN THE BANKS, THE FED, THE GOVERNMENT, AND THE PRIVATE SECTOR**

PRIVATE NONFINANCIAL		BANKS		FED		GOVERNMENT	
ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES
					Currency (CU)		
			Deposits (D)				
		Bonds (B)		Bonds (B)			Bonds (B)
			Reserves (RE)		Reserves (RE)		
	Loans	Loans					

# Federal Reserve System: Organization



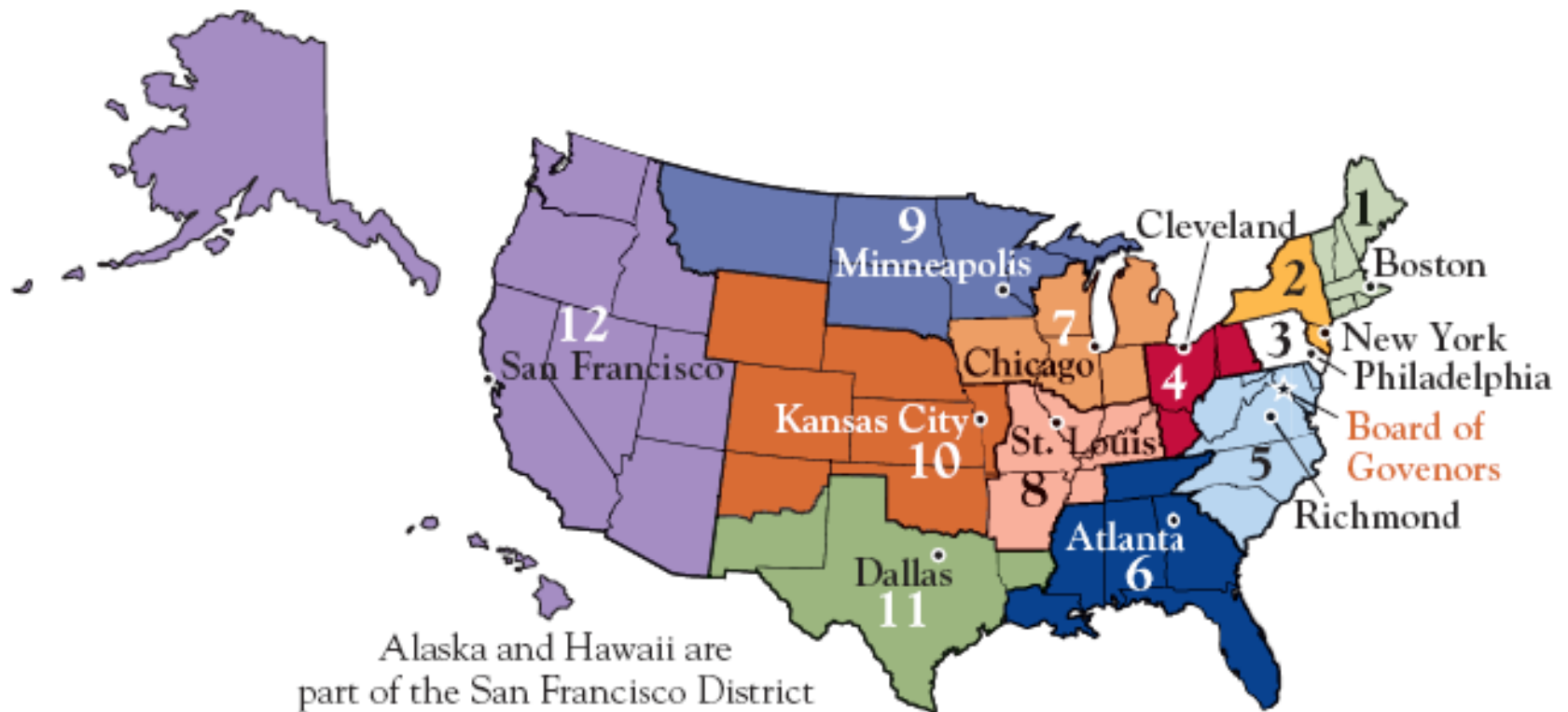
**FIGURE 1** Structure and Responsibility for Policy Tools in the Federal Reserve System

# Federal Reserve System: Regional Distribution

Figure 16.1

The Federal Reserve System

The 12 Federal Reserve Banks and their districts.



# Comparing Organizational Structure

**Table 16.2** Key Aspects of the European Central Bank

Federal Reserve Banks =>

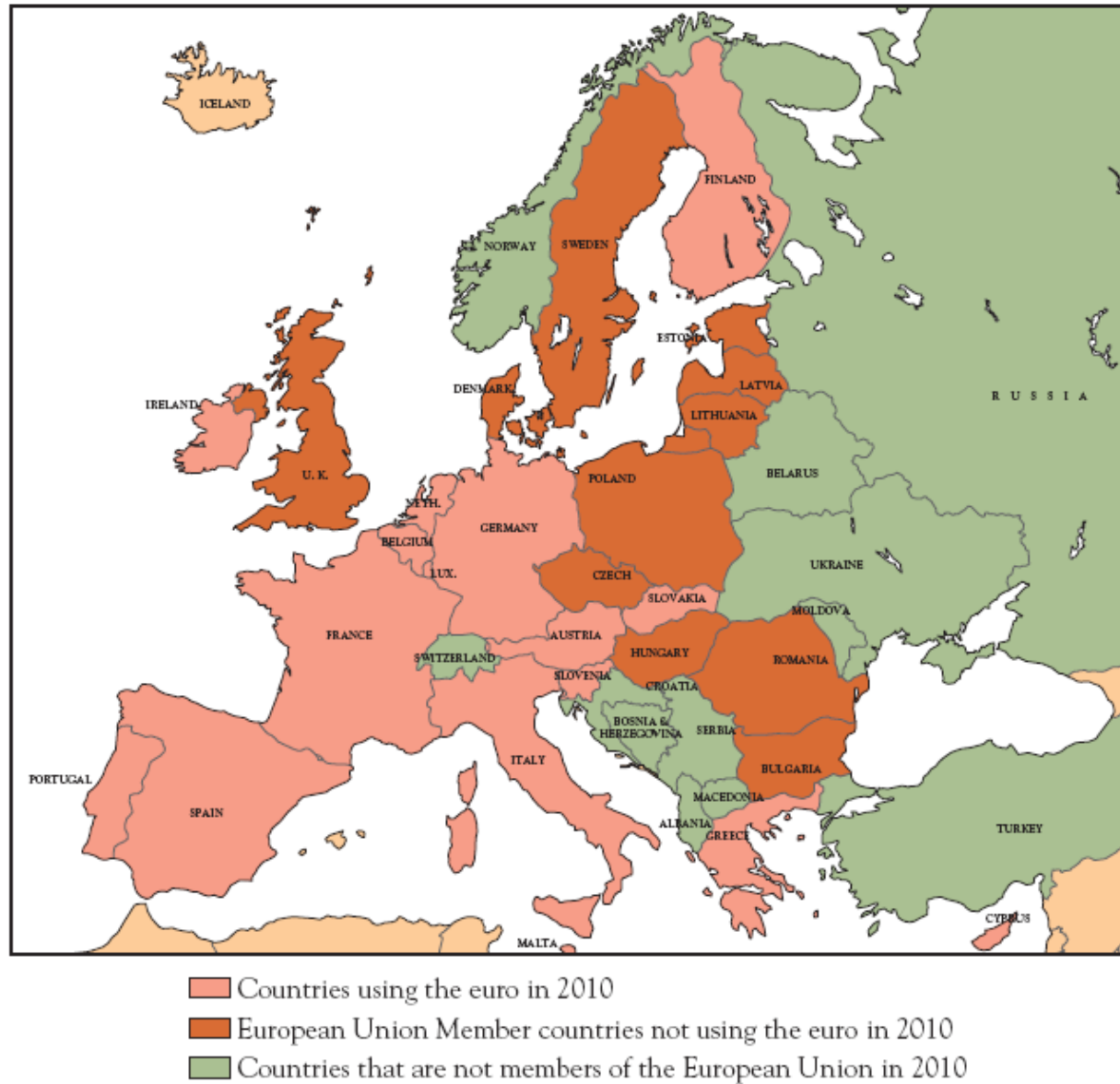
Board of Governors ==>

FOMC =====>

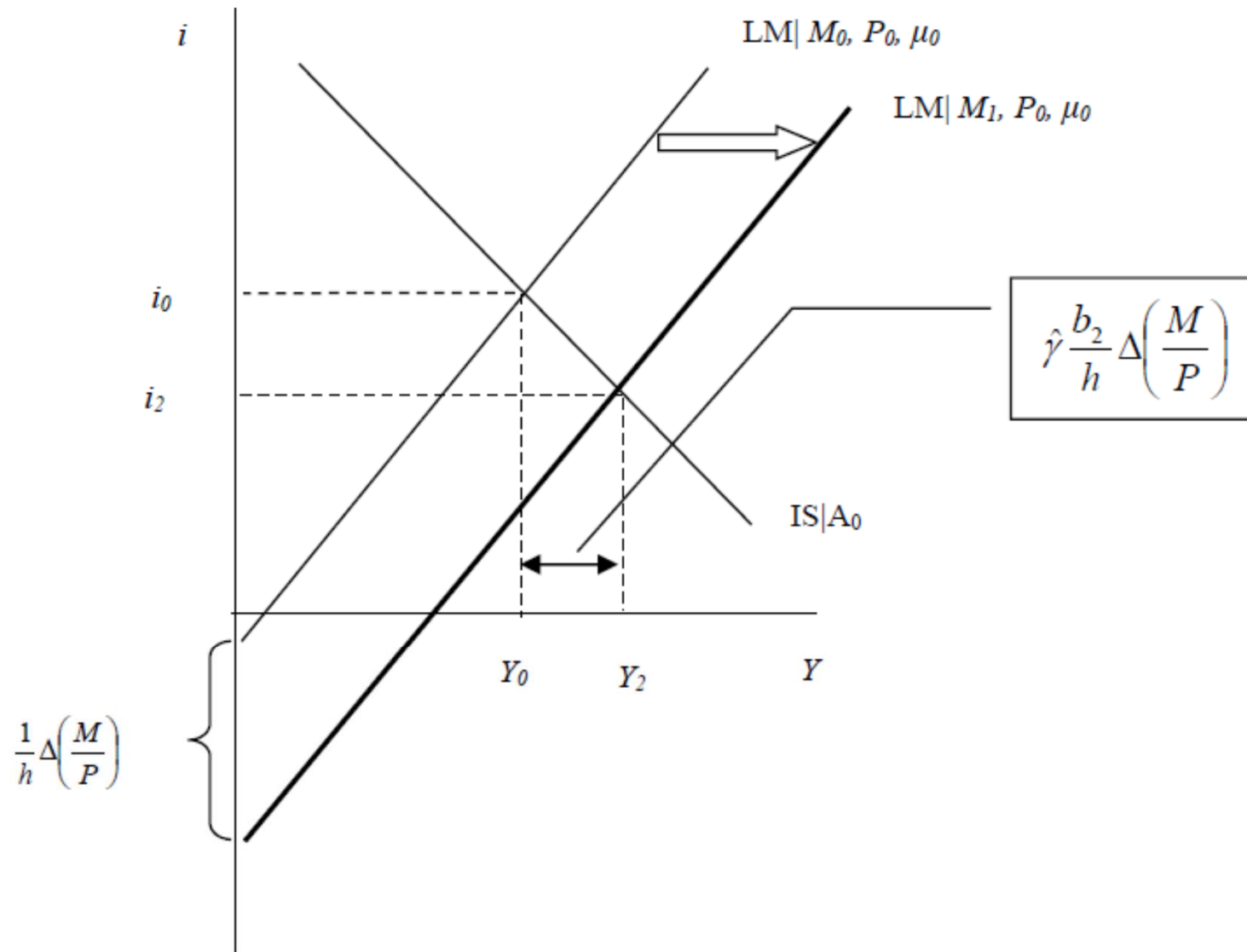
European Central Bank (ECB)	The central authority in Frankfurt, Germany, that oversees monetary policy in the common currency area. (Established July 1, 1998.)
National Central Banks (NCBs)	The central banks of the countries that belong to the European Union.
European System of Central Banks (ESCB)	The ECB plus the NCBs of all the countries in the European Union, including those that do not participate in the monetary union.
Eurosystem	The ECB plus the NCBs of participating countries; together, they carry out the tasks of central banking in the euro area.
ECB Executive Board	The six-member body in Frankfurt that oversees the operation of the ECB and the Eurosystem.
Governing Council	The (currently) 22-member committee that makes monetary policy in the common currency area.
Euro	The currency used in the countries of the European Monetary Union.
Euro area	The countries that use the euro as their currency.

Figure 16.3

The European System of Central Banks

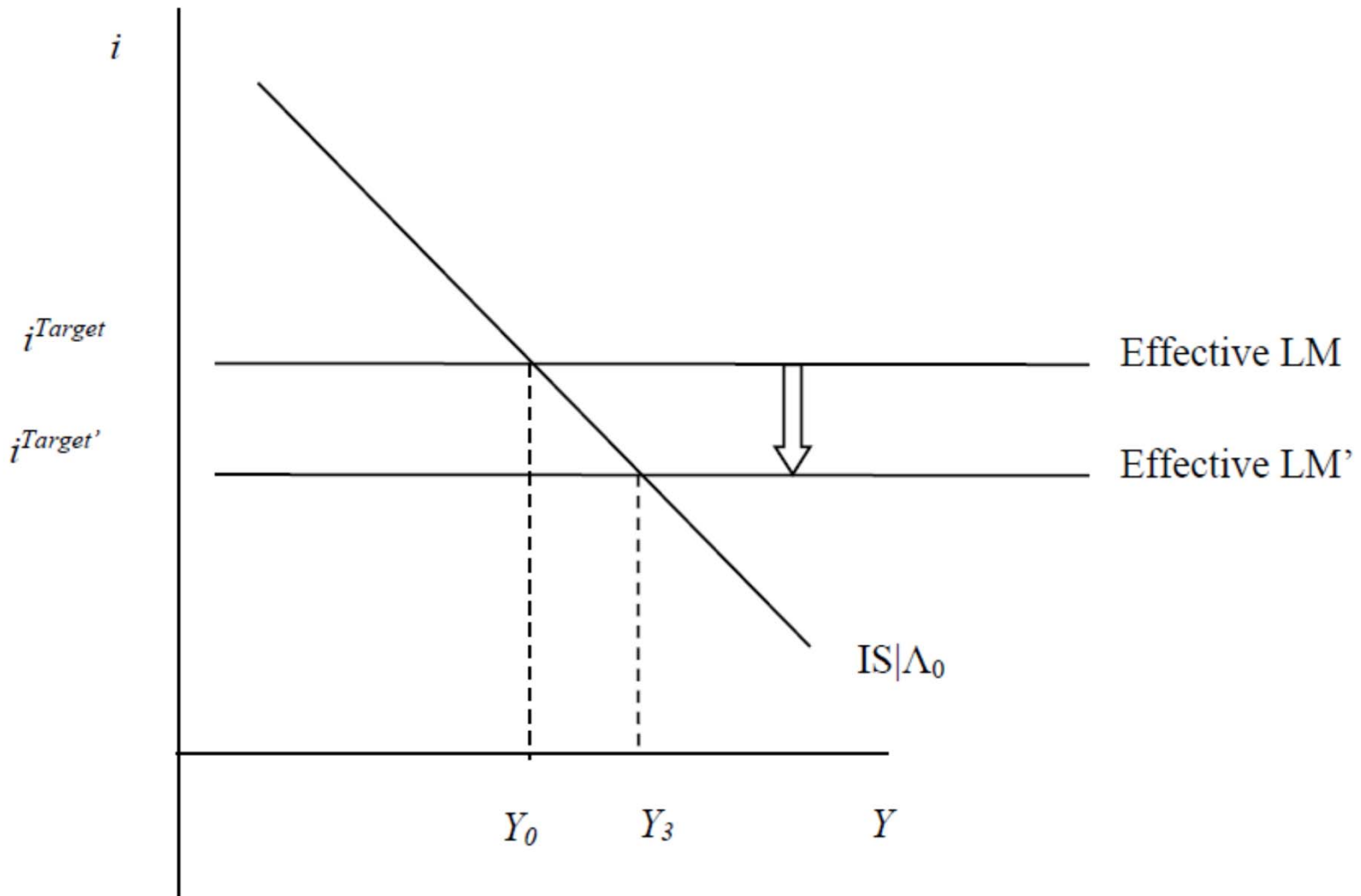


# Textbook Monetary Policy (pre-2008)





# Monetary Policy in Practice (pre-2008)



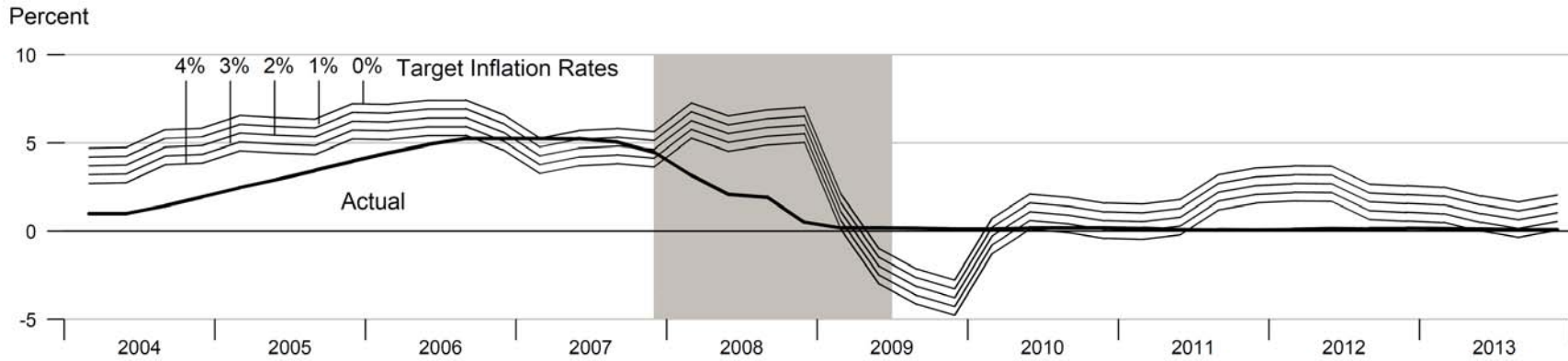
# Taylor Rules

$$i_t^{FedFunds} = \pi_t + \beta(y_t - y_t^*) + \delta(\pi_t - \pi_t^*) + r_t^*$$

$$i_t^{FedFunds} = (1 + \delta)\pi_t + \beta(y_t - y_t^*) + r_t^* - \delta\pi_t^*$$

- Positive statement? Is this how central banks behave?
- Or normative statement? Is this how central banks *should* behave?

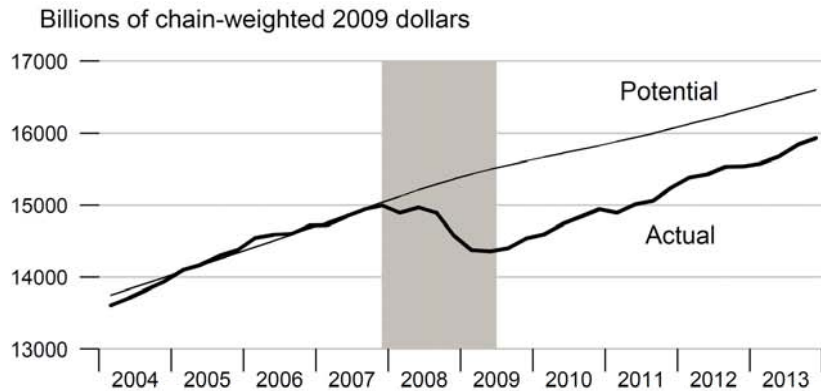
## Federal Funds Rate and Inflation Targets



Calculated federal funds rate is based on Taylor's rule.

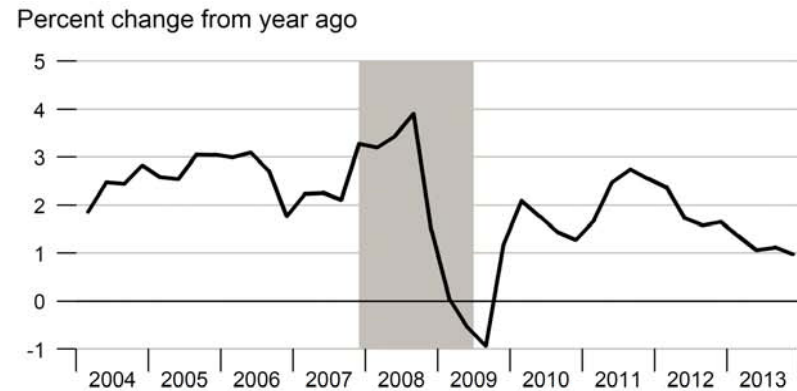
## Components of Taylor's Rule

### Actual and Potential Real GDP



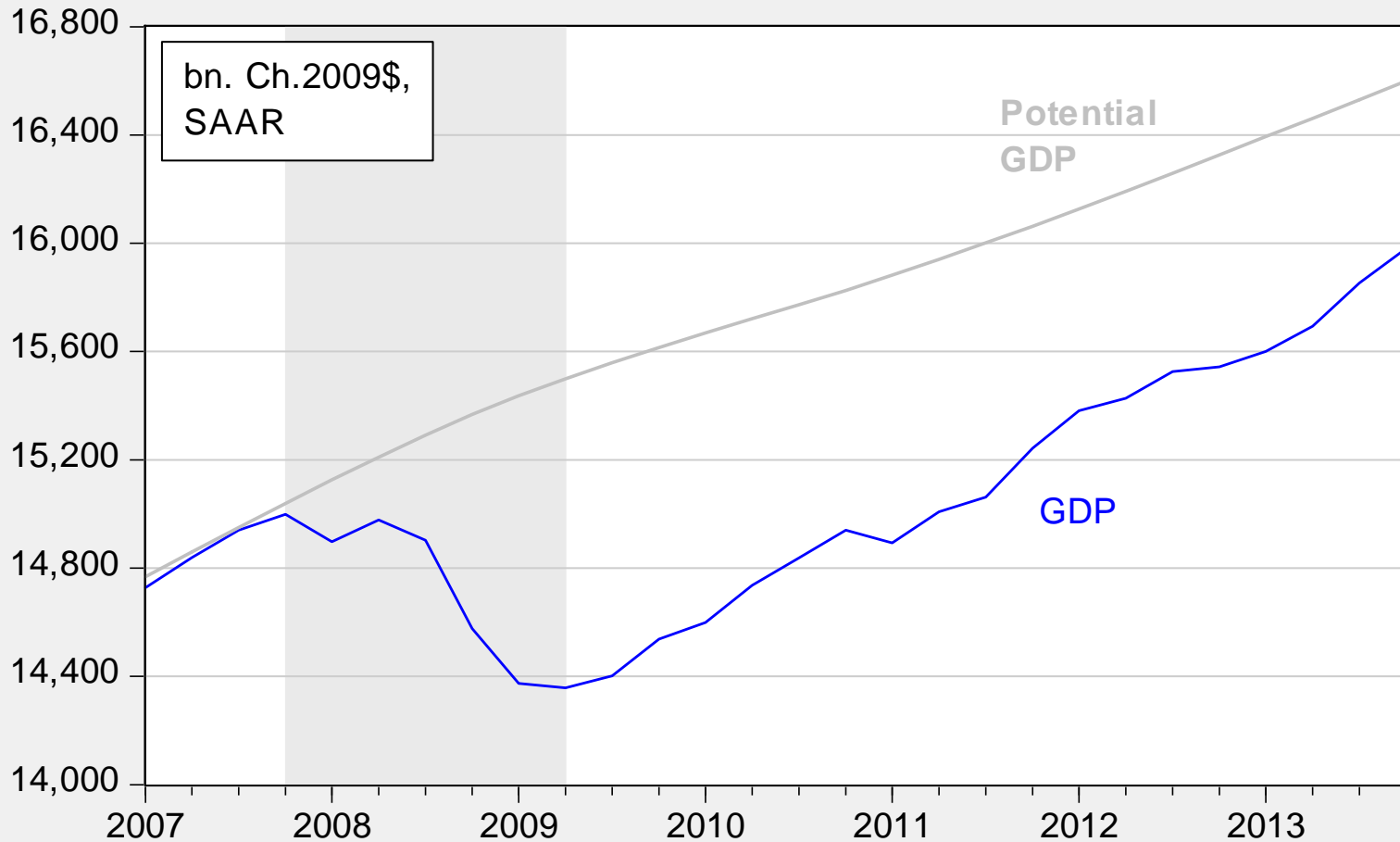
See notes section for further explanation.

### PCE Inflation



Source: St. Louis Fed, *Monetary Trends*. March 2014.

# GDP and Potential



Source: BEA, 2013Q4 2<sup>nd</sup> release; CBO (Feb. 2014), adjusted.

# FRB St. Louis Interpretation of the Taylor Rule

*Page 10: Federal Funds Rate and Inflation Targets* shows the observed federal funds rate, quarterly, and the level of the funds rate implied by applying Taylor's (1993) equation

$$f_t^* = 2.5 + \pi_{t-1} + (\pi_{t-1} - \pi^*)/2 + 100 \times (y_{t-1} - y_{t-1}^P)/2$$

to five alternative target inflation rates,  $\pi^* = 0, 1, 2, 3, 4$  percent, where  $f_t^*$  is the implied federal funds rate,  $\pi_{t-1}$  is the previous period's inflation rate (PCE) measured on a year-over-year basis,  $y_{t-1}$  is the log of the previous period's level of real gross domestic product (GDP), and  $y_{t-1}^P$  is the log of an estimate of the previous period's level of potential output. **Potential Real GDP** is estimated by the Congressional Budget Office (CBO).

# FRB SF Interpretation of the Taylor Rule

Figure 1  
Federal funds, unemployment, and inflation rates  
Percent

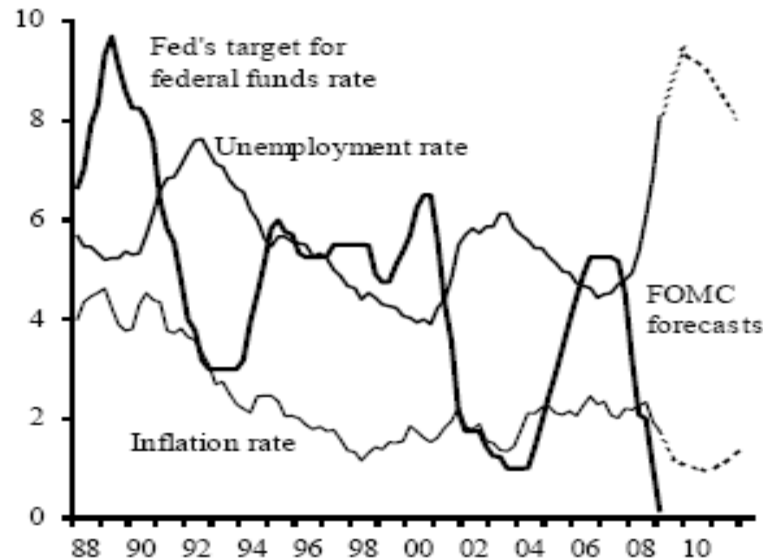
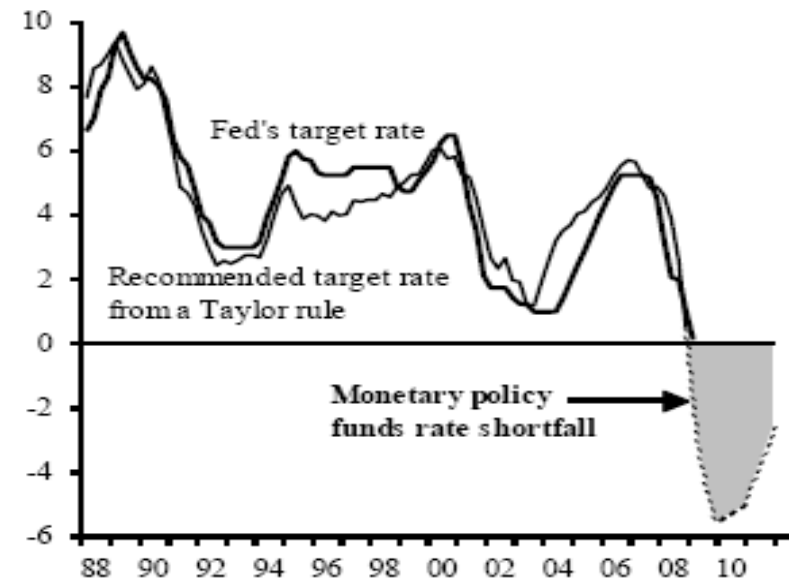


Figure 2  
Federal funds rate  
Percent



$$i_t^{FedFunds} = \pi_t - 2(u_t - u_t^*) + 0.3(\pi_t - \pi_t^*) + r_t^*$$

# “Your Name Here” Interpretation of the Taylor Rule

## Baseline Taylor Rule Estimates of the Fed Funds Rate (1987-2012)



Source: Bloomberg; {TAYL <go>}

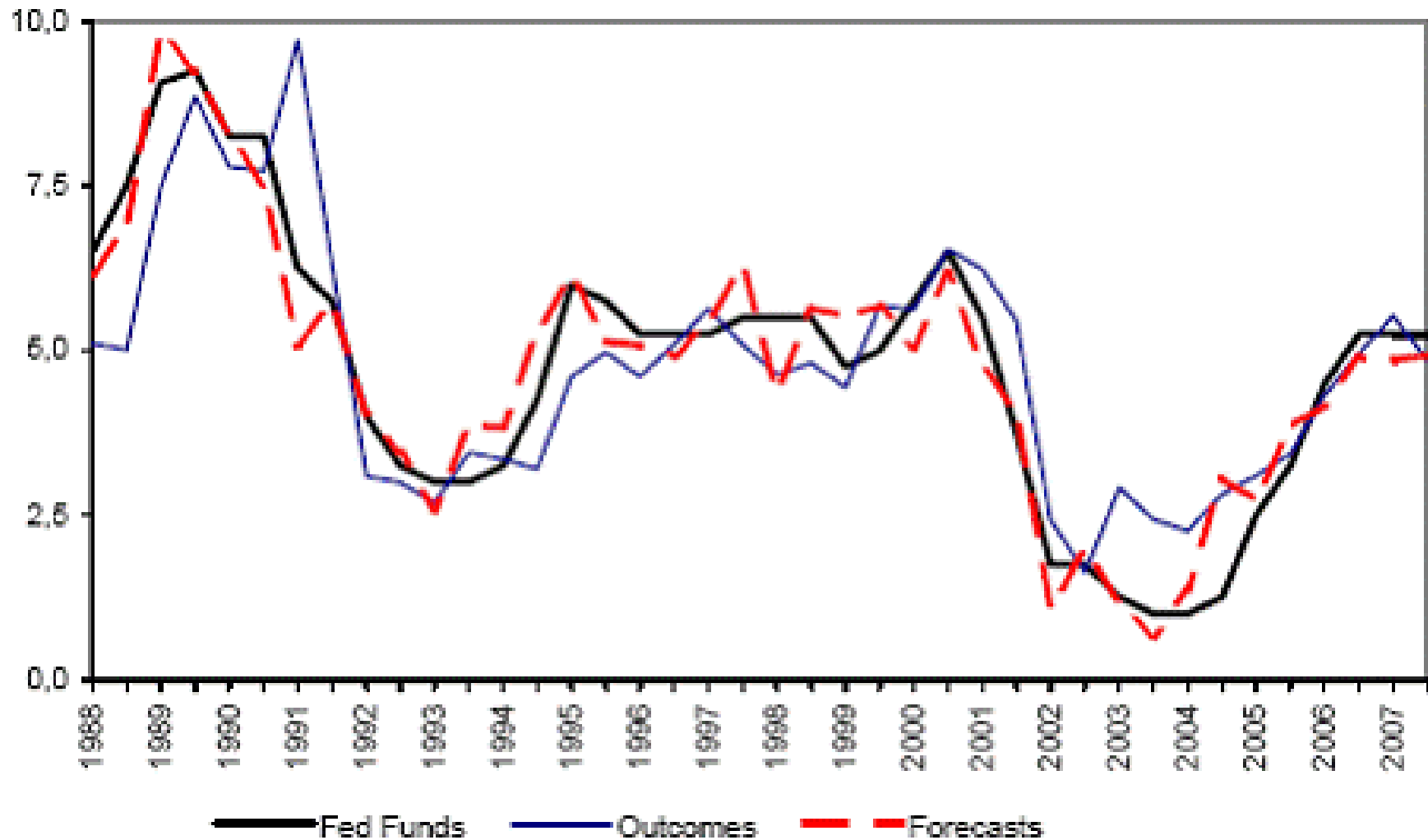
Bloomberg Financial Conditions Watch (Dec. 12, 2012)

# Issues (within the framework)

- Which activity variable (output, unemployment)?
- Which inflation measure (CPI, PCE deflator, or respective core measures; 12 month, 3 month, etc.)
- What is the “natural” rate of real interest rate?
- Should it be forecasted output and inflation that matters?
- How to deal with data revisions?



# Using Forecasted Values of $y, \pi$



Source: Orphanides and Wieland (2007)

# The Impact of Data Revisions

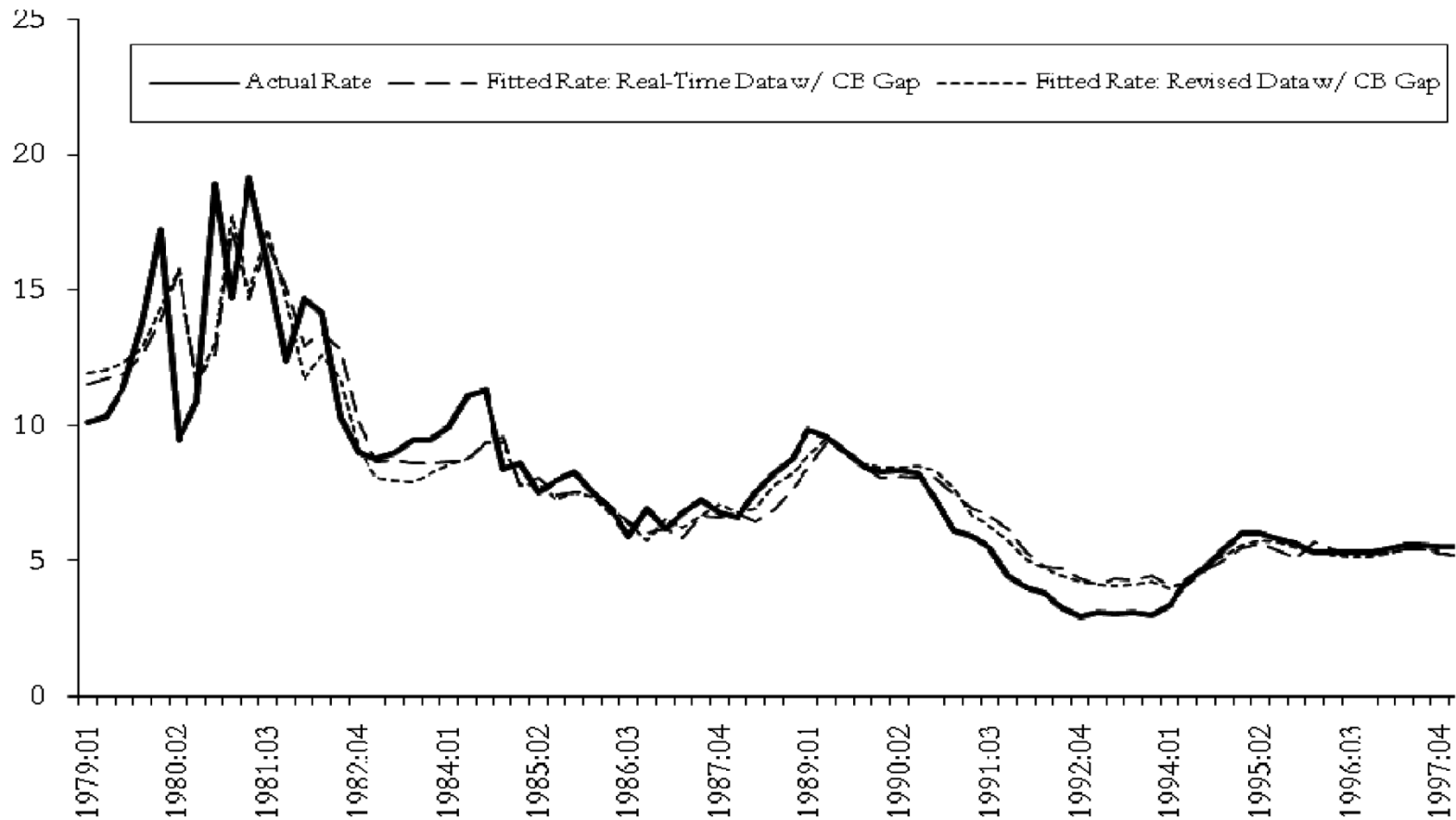
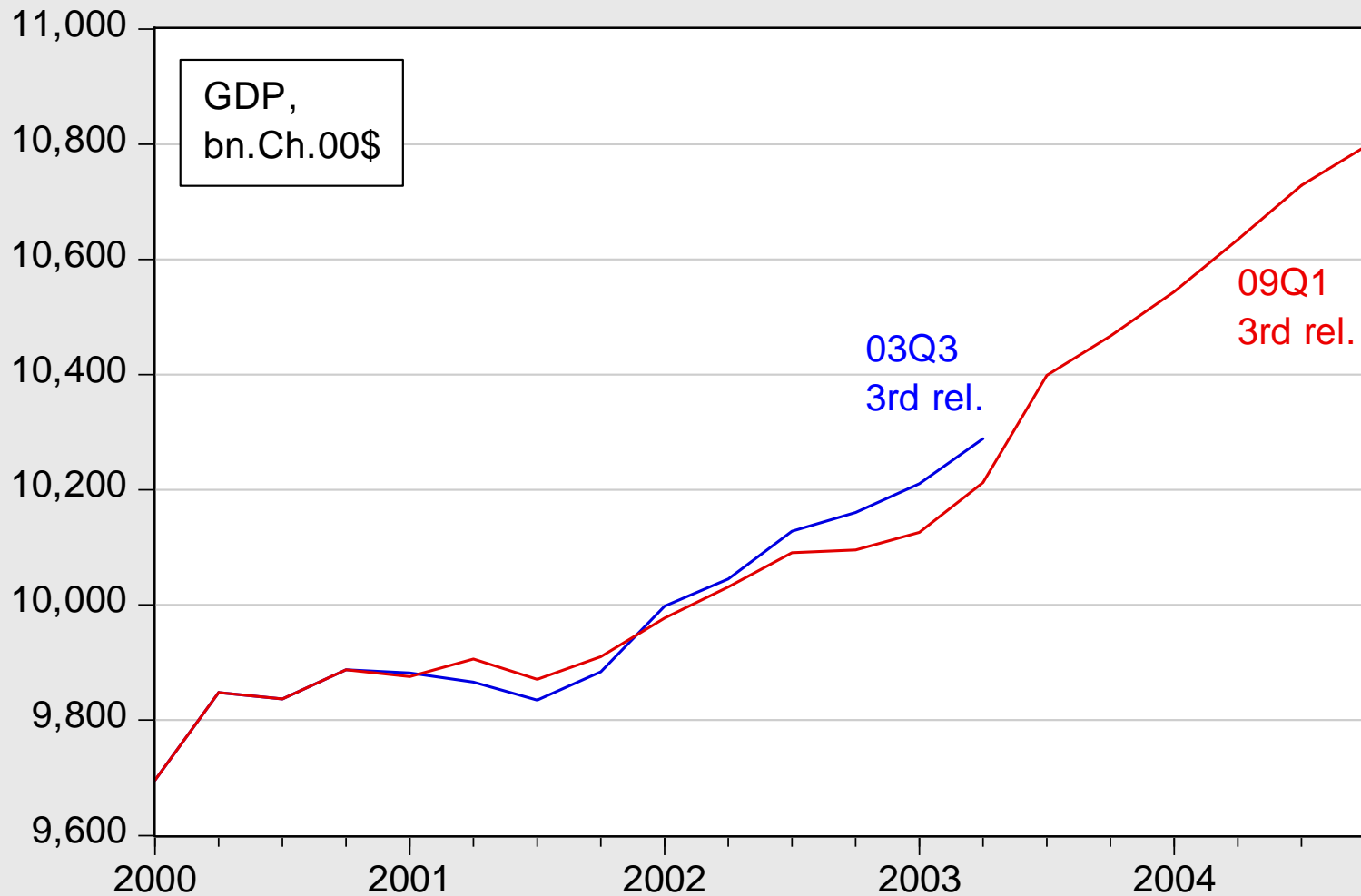


Figure 3. Actual and Fitted Values of U.S. Federal Funds Rate

Source: Molodtsova, et al. (*JME* 2008).

<http://www.uh.edu/class/economics/news-research/working-papers/docs/2007-03.pdf>

# Revisions in 2001-03



# Taylor Rules and Inflation Targeting

$$i_t^{FedFunds} = \pi_t + \beta(y_t - y_t^*) + \delta(\pi_t - \pi_t^*) + r_t^*$$

$$i_t^{FedFunds} = (1 + \delta)\pi_t + \beta(y_t - y_t^*) + r_t^* - \delta\pi_t^*$$

- Question of interpretation: Why does the output gap enter? Is it determinant of future inflation (via Phillips Curve)? If so, Taylor rule is inflation targeting.
- More explicit: Set  $\beta=0$ ,  $\delta=1$ .