Economics 435
The Financial System
(3/24)

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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

<table>
<thead>
<tr>
<th>PRIVATE NONFINANCIAL</th>
<th>BANKS</th>
<th>FED</th>
<th>GOVERNMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSETS</td>
<td>LIABILITIES</td>
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<td>LIABILITIES</td>
</tr>
<tr>
<td>Currency (CU)</td>
<td>Deposits (D)</td>
<td>Bonds (B)</td>
<td>Reserves (RE)</td>
</tr>
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<td>Reserves (RE)</td>
<td>Reserves (RE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loans</td>
<td>Loans</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Federal Reserve System: Organization

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

Source: Mishkin
Federal Reserve System: Regional Distribution

Figure 16.1
The Federal Reserve System
The 12 Federal Reserve Banks and their districts.

Alaska and Hawaii are part of the San Francisco District
### Comparing Organizational Structure

#### Table 16.2: Key Aspects of the European Central Bank

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Central Bank (ECB)</td>
<td>The central authority in Frankfurt, Germany, that oversees monetary policy in the common currency area. (Established July 1, 1998.)</td>
</tr>
<tr>
<td>National Central Banks (NCBs)</td>
<td>The central banks of the countries that belong to the European Union.</td>
</tr>
<tr>
<td>European System of Central Banks (ESCB)</td>
<td>The ECB plus the NCBs of all the countries in the European Union, including those that do not participate in the monetary union.</td>
</tr>
<tr>
<td>Eurosysterm</td>
<td>The ECB plus the NCBs of participating countries; together, they carry out the tasks of central banking in the euro area.</td>
</tr>
<tr>
<td>ECB Executive Board</td>
<td>The six-member body in Frankfurt that oversees the operation of the ECB and the Eurosysterm.</td>
</tr>
<tr>
<td>Governing Council</td>
<td>The (currently) 22-member committee that makes monetary policy in the common currency area.</td>
</tr>
<tr>
<td>Euro</td>
<td>The currency used in the countries of the European Monetary Union.</td>
</tr>
<tr>
<td>Euro area</td>
<td>The countries that use the euro as their currency.</td>
</tr>
</tbody>
</table>
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 \textit{should} behave?
Federal Funds Rate and Inflation Targets

Components of Taylor's Rule

Actual and Potential Real GDP

PCE Inflation

GDP and Potential

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

Fed's target for federal funds rate
Unemployment rate
FOMC forecasts
Inflation rate

Figure 2
Federal funds rate
Percent

Fed's target rate
Recommended target rate from a Taylor rule
Monetary policy funds rate shortfall

\[ i_{t,FedFunds} = \pi_t - 2(u_t - u^*_t) + 0.3(\pi_t - \pi^*_t) + r^*_t \]
“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

GDP, bn.Ch.00$

03Q3
3rd rel.

09Q1
3rd rel.
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 $\beta=0$, $\delta=1$. 