Chapter 14

Monetary Policy and the Federal Reserve System
Chapter Outline

- Principles of Money Supply Determination
- Monetary Control in the United States
- The Conduct of Monetary Policy: Rules Versus Discretion
Principles of Money Supply Determination

• Three groups affect the money supply
  – The central bank is responsible for monetary policy
  – Depository institutions (banks) accept deposits and make loans
  – The public (people and firms) holds money as currency and coin or as bank deposits
Principles of Money Supply Determination

- The money supply in an all-currency economy
  - A trading system based on barter is inconvenient
  - The creation of a central bank to print money can improve matters
    - The central bank uses money it prints to buy real assets from the public; this gets money in circulation
    - People accept the paper money if they believe other people will accept it in exchange
    - The government often decrees that the paper money is *legal tender*, so that it can be used to pay off debts and the government will accept it for tax payments
    - The central bank’s assets are the real assets it buys from the public; its liabilities are the paper money it issued
    - That money is called the monetary base, or high-powered money
Principles of Money Supply Determination

• The money supply in an all-currency economy
  – In an all-currency economy, the money supply equals the monetary base
Principles of Money Supply Determination

• The money supply under fractional reserve banking
  – As an economy becomes more sophisticated financially, banks develop
  – If currency is easily lost or stolen, people may want to hold all their money in bank deposits and none in currency
    • In this case, the consolidated balance sheet of banks has assets of all the currency in the economy and liabilities consisting of all the bank deposits
    • The balance sheet of the central bank is unchanged from the case in the all-currency economy
Principles of Money Supply Determination

- The money supply under fractional reserve banking
  - The currency that banks hold is called *bank reserves*
  - When bank reserves are equal to deposits, the system is called *100% reserve banking*
  - To make money, banks would have to charge fees for deposits, since they earn no interest on reserves
Principles of Money Supply Determination

• The money supply under fractional reserve banking
  – Rather than holding reserves that earn no interest, suppose a bank lent some of the reserves
    • It could do this, since the flow of money in and out of the bank is fairly predictable and only a fraction of reserves are needed to meet the need for outflows
    • If the bank needs to keep only 25% of the amount of its deposits on reserve to meet the demand for funds, it can lend the other 75%
    • The reserve-deposit ratio would be 25%
    • When the reserve-deposit ratio is less than 100%, the system is called fractional reserve banking
Principles of Money Supply Determination

• The money supply under fractional reserve banking
  – When all the banks catch on to this idea, they will all make loans as the economy undergoes a *multiple expansion of loans and deposits*
Principles of Money Supply Determination

• The money supply under fractional reserve banking
  – The process stops only when the banks’ currency holdings (reserves) are exactly 25% of their total deposits, with loans equal to 75% of total deposits
    • For example, if the monetary base is $1 million, banks would make $3 million in loans, so their total assets would be $4 million
    • In loaning the $3 million, banks create $3 million in new deposits
    • Adding the $3 million in new deposits to the $1 million in existing deposits gives total liabilities in the banking system of $4 million
Principles of Money Supply Determination

• The money supply under fractional reserve banking
  – The money supply in this economy is equal to the total amount of bank deposits ($4 million in the example)
  – The relationship between the monetary base and the money supply can be shown algebraically
    • Let $M =$ money supply, $BASE =$ monetary base, $DEP =$ bank deposits, $RES =$ bank reserves, $res =$ banks’ desired reserve-deposit ratio ($RES/DEP$)
    • Since no currency is held by the public,
      $M = DEP$  \hspace{1cm} (14.1)
Principles of Money Supply Determination

• The money supply under fractional reserve banking
  – Banks want to hold $res \times DEP$ in reserves, which must equal the amount of currency distributed by the central bank, so
    \[ res \times DEP = BASE \]  \hspace{1cm} (14.2)
  – Using Eqs. (14.1) and (14.2) gives
    \[ M = DEP = BASE/res \]  \hspace{1cm} (14.3)
  – So an economy with fractional reserve banking and no currency held by the public has money supply equal to the monetary base divided by the reserve-deposit ratio
Principles of Money Supply Determination

- The money supply under fractional reserve banking
  - Each unit of monetary base allows 1/res of money to be created
  - The monetary base is called high-powered money because each unit of the base that is issued leads to the creation of more money
Principles of Money Supply Determination

• Bank runs
  – In the example, banks plan on never having to pay out more than 25% of their deposits
  – If more people wanted to get their money from the bank, the bank would be unable to give them their funds
  – If people think a bank won’t be able to give them their money, they may panic and rush to withdraw their money, causing a bank run
Principles of Money Supply Determination

- The money supply with both public holdings of currency and fractional reserve banking
  - If there is both public holding of currency and fractional reserve banking, the picture gets more complicated
  - The money supply consists of currency held by the public and deposits, so
    \[ M = CU + DEP \]  \hspace{1cm} (14.4)
  - The monetary base is held as currency by the public and as reserves by banks, so
    \[ BASE = CU + RES \]  \hspace{1cm} (14.5)
Principles of Money Supply Determination

• The money supply with both public holdings of currency and fractional reserve banking
  – Taking the ratio of these two equations gives
    \[
    \frac{M}{BASE} = \frac{CU + DEP}{CU + RES} \quad (14.6)
    \]
  – This can be written as
    \[
    \frac{M}{BASE} = \frac{\left(\frac{CU}{DEP}\right) + 1}{\left(\frac{CU}{DEP}\right) + \frac{RES}{DEP}} \quad (14.7)
    \]
  – The currency-deposit ratio \((CU/DEP, \text{ or } cu)\) is determined by the public
  – The reserve-deposit ratio \((RES/DEP, \text{ or } res)\) is determined by banks
Principles of Money Supply Determination

- The money supply with both public holdings of currency and fractional reserve banking
  - Rewrite Eq. (14.7) as
    \[ M = \frac{(cu + 1)}{(cu + res)}BASE \] (14.8)
  - The term \( \frac{(cu + 1)}{(cu + res)} \) is the money multiplier
    - The money multiplier is greater than 1 for \( res \) less than 1 (that is, with fractional reserve banking)
    - If \( cu = 0 \), the multiplier is \( 1/res \), as when all money is held as deposits
    - The multiplier decreases when either \( cu \) or \( res \) rises
    - Look at U.S. data to illustrate the multiplier (Table 14.1)
**Table 14.1 The Monetary Base, the Money Multiplier, and the Money Supply in the United States**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currency, $CU</td>
<td>$741.2 billion</td>
</tr>
<tr>
<td>Bank reserves, $RES</td>
<td>$71.0 billion</td>
</tr>
<tr>
<td>Monetary base, $BASE ($=CU + RES)</td>
<td>$812.2 billion</td>
</tr>
<tr>
<td>Deposits, $DEP</td>
<td>$636.4 billion</td>
</tr>
<tr>
<td>Money supply, $M ($=CU + DEP)</td>
<td>$1377.5 billion</td>
</tr>
<tr>
<td>Reserve-deposit ratio, res ($=RES/DEP)</td>
<td>0.1116</td>
</tr>
<tr>
<td>Currency-deposit ratio, cu ($=CU/DEP)</td>
<td>1.1647</td>
</tr>
<tr>
<td>Money multiplier ($cu + 1)/($cu + res)</td>
<td>1.70</td>
</tr>
<tr>
<td>Ratio of money supply to base, $M/$BASE</td>
<td>1.70</td>
</tr>
</tbody>
</table>

*Source: Federal Reserve Statistical Releases H.3 and H.6, August 3, 2006. Deposits are transactions deposits plus travelers’ checks, and the money supply is M1. Data are for June 2006. For recent data and historical series, see [www.federalreserve.gov/releases](http://www.federalreserve.gov/releases).*
Principles of Money Supply Determination

• Open-market operations
  – The most direct and frequently used way of changing the money supply is by raising or lowering the monetary base through open-market operations
  – To increase the monetary base, the central bank prints money and uses it to buy assets in the market; this is an open-market purchase
    • If the central bank wishes to increase the money supply by 15%, it purchases 15% more assets and its liabilities increase by 15%, which is the currency it issues
    • To decrease the monetary base, the central bank sells assets in the market and retires the money it receives; this is an open-market sale
    • For a constant money multiplier, the decline or fall in the monetary base of 15% is matched by a decline or fall in the money supply of 15%
Principles of Money Supply Determination

• Application: The money multiplier during the Great Depression
  – The money multiplier is usually fairly stable, but it fell sharply in the Great Depression
  – The decline in the multiplier was due to bank panics, which affected the multiplier in two ways
    • People became mistrustful of banks and increased the currency-deposit ratio (text Fig. 14.1)
    • Banks held more reserves, in anticipation of bank runs, which raised the reserve-deposit ratio
Figure 14.1 The currency-deposit ratio and the reserve-deposit ratio in the Great Depression.
Principles of Money Supply Determination

• Application: The money multiplier during the Great Depression
  – Even though the monetary base grew 20% from March 1930 to March 1933, the money supply fell 35% (text Fig. 14.2)
  – As a result, the price level fell sharply (nearly one-third) and there was a decline in output (though attributing the drop in output to the decline in the money supply is controversial)
Figure 14.2 Monetary variables in the Great Depression

(a) The monetary base and the money multiplier in the Great Depression

(b) The money supply in the Great Depression
Monetary Control in the United States

• The Federal Reserve System
  – The Fed began operation in 1914 for the purpose of eliminating severe financial crises
  – There are twelve regional Federal Reserve Banks (Boston, New York, Philadelphia, Cleveland, Richmond, Atlanta, Chicago, St. Louis, Minneapolis, Kansas City, Dallas, and San Francisco), which are owned by private banks within each district (text Fig. 14.3)
Figure 14.3 Location of the Federal Reserve Banks

- Boundaries of Federal Reserve districts
- Board of Governors of the Federal Reserve System
- Federal Reserve Bank cities

†Hawaii and Alaska are included in the San Francisco district.
Monetary Control in the United States

• The Federal Reserve System
  – The leadership of the Fed is provided by the Board of Governors in Washington, D.C.
    • There are seven governors, who are appointed by the president of the United States, and have fourteen-year terms
    • The chairman of the Board of Governors has considerable power, and has a term of four years
Monetary Control in the United States

- The Federal Reserve System
  - Monetary policy decisions are made by the Federal Open Market Committee (FOMC), which consists of the seven governors plus five presidents of the Federal Reserve Banks on a rotating basis (with the New York president always on the committee)
    - The FOMC meets eight times a year
    - It may meet more frequently if economic developments warrant
Monetary Control in the United States

- The Federal Reserve’s balance sheet and open-market operations
  - Balance sheet of Fed (text Table 14.2)
    - Largest asset is holdings of Treasury securities
    - Also owns gold, makes loans to banks, and holds other assets including foreign exchange and federal agency securities
    - Largest liability is currency outstanding
      - Some is held in bank vaults and is called vault cash
      - The rest is held by the public
    - Another liability is deposits by banks and other depository institutions
    - Vault cash plus banks’ deposits at the Fed are banks’ total reserves (RES)
### Table 14.2 The Balance of the Federal Reserve System (Billions of Dollars)

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold</td>
<td>Currency</td>
</tr>
<tr>
<td>Loans to depository institutions</td>
<td>Vault cash</td>
</tr>
<tr>
<td>U.S. Treasury securities</td>
<td>Held by nonbank public</td>
</tr>
<tr>
<td>Other assets</td>
<td>Deposits of depository</td>
</tr>
<tr>
<td></td>
<td>institutions</td>
</tr>
<tr>
<td></td>
<td>Other liabilities and net worth</td>
</tr>
<tr>
<td>Total</td>
<td>Total</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold</td>
<td>$11.0</td>
<td>Currency</td>
</tr>
<tr>
<td>Loans to depository institutions</td>
<td>$1.3</td>
<td>Vault cash $49.7</td>
</tr>
<tr>
<td>U.S. Treasury securities</td>
<td>$764.8</td>
<td>Held by nonbank public $743.1</td>
</tr>
<tr>
<td>Other assets</td>
<td>$107.2</td>
<td>Deposits of depository institutions $21.1</td>
</tr>
<tr>
<td>Total</td>
<td>$884.3</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$884.3</td>
</tr>
</tbody>
</table>

**Addenda**

Reserves = deposits of depository institutions + vault cash = $70.8 billion.
Monetary base = currency held by the nonbank public + reserves = $813.9 billion.

**Note:** Numbers may not add to totals shown owing to rounding.

**Source:** Federal Reserve Statistical Releases H.4.1 and H.3. Data are for August 2, 2006.
Monetary Control in the United States

• The Federal Reserve’s balance sheet and open-market operations
  – The monetary base equals banks’ reserves plus currency held by the nonbank public (text Fig. 14.4)
  – The primary method for changing the monetary base is open-market operations
Figure 14.4 Components of the monetary base

- Deposits of depository institutions ($21.1 billion)
- Vault cash ($49.7 billion)
- Currency held by nonbank public (CUS) ($743.1 billion)
- Reserves (RES) ($70.8 billion)

Total currency outstanding ($792.8 billion)

MONETARY BASE ($813.9 BILLION)
Monetary Control in the United States

- Other means of controlling the money supply
  - Reserve requirements
    - The Fed sets the minimum fraction of each type of deposit that a bank must hold as reserves
    - An increase in reserve requirements forces banks to hold more reserves, thus reducing the money multiplier
Monetary Control in the United States

• Other means of controlling the money supply
  – Discount window lending
    • Discount window lending is lending reserves to banks so they can meet depositors’ demands or reserve requirements
    • The interest rate on such borrowing is called the discount rate
    • The Fed was set up to halt financial panics by acting as a lender of last resort through the discount window
    • A discount loan increases the monetary base
    • Increases in the discount rate discourage borrowing and reduce the monetary base
Monetary Control in the United States

- Other means of controlling the money supply
  - The Fed modified the discount window in 2003
    - Previously, the Fed discouraged banks from borrowing from the Fed and encouraged them to borrow from each other in the Federal funds market
    - The interest rate in the Federal funds market is the Fed funds rate
    - The Fed funds rate is a market rate of interest, determined by supply and demand
    - By contrast, the discount rate is set by the Fed
    - Under the new procedure, the Fed sets the discount rate above the Fed funds rate (Fig. 14.5)
Figure 14.5 The discount rate and the Fed funds rate, 1979-2006
Monetary Control in the United States

• Other means of controlling the money supply
  – The Fed modified the discount window in 2003
    • Banks in good condition may take out a primary credit discount loan with no questions asked, at the primary credit discount rate
    • Banks that are not in good condition may take out a secondary credit discount loan at a higher interest rate under careful supervision by the Fed
    • The new policy is intended to improve the operation of the discount loan procedure and to reduce the volatility of the Federal funds rate
### Summary 19

<table>
<thead>
<tr>
<th>Factors Affecting the Monetary Base, the Money Multiplier, and the Money Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor</strong></td>
</tr>
<tr>
<td>An increase in the reserve–deposit ratio, (res)</td>
</tr>
<tr>
<td>An increase in the currency–deposit ratio, (cu)</td>
</tr>
<tr>
<td>An open-market purchase</td>
</tr>
<tr>
<td>An open-market sale</td>
</tr>
<tr>
<td>An increase in reserve requirements</td>
</tr>
<tr>
<td>An increase in discount window borrowing</td>
</tr>
<tr>
<td>An increase in the discount rate</td>
</tr>
</tbody>
</table>

*Note: The relationship among the money supply, the money multiplier, and the monetary base is \(M = [(cu + 1)/(cu + res)]BASE\).*
Monetary Control in the United States

- Intermediate targets
  - The Fed uses intermediate targets to guide policy as a step between its tools or instruments (such as open-market purchases) and its goals or ultimate targets of price stability and stable economic growth
  - Intermediate targets are variables the Fed can’t directly control but can influence predictably, and they are related to the Fed’s goals
  - Most frequently used are monetary aggregates such as M1 and M2, and short-term interest rates, such as the Fed funds rate
Monetary Control in the United States

• Intermediate targets
  – The Fed cannot target both the money supply and the Fed funds rate simultaneously
    • Suppose both the money supply and the Fed funds rate were above target, so the Fed needs to lower them
    • Since a decrease in the money supply shifts the $LM$ curve up, it will increase the Fed funds rate
  – In recent years the Fed has been targeting the Fed funds rate (Fig. 14.6)
Figure 14.6 Interest rate targeting
Monetary Control in the United States

• Intermediate targets
  – This strategy (targeting the Fed funds rate) works well if the main shocks to the economy are to the $LM$ curve (shocks to money supply or money demand)
  – The strategy stabilizes output, the real interest rate, and the price level, as it offsets the shocks to the $LM$ curve completely
  – But if other shocks to the economy (such as $IS$ shocks) are more important than nominal shocks, the policy may be destabilizing, unless the Fed changes the target for the Fed funds rate
Monetary Control in the United States

• Intermediate targets
  – Suppose a shock shifts the IS curve to the right (Fig. 14.7)
    • If the Fed were to maintain the real interest rate, it would increase the money supply, thus making output rise even more, which would be destabilizing
    • Instead, the Fed needs to raise the real interest rate to stabilize output
    • Research suggests that the optimal Fed funds rate varies substantially over time
Figure 14.7 Interest rate targeting when an IS shock occurs
Monetary Control in the United States

• Making monetary policy in practice
  – The IS-LM model makes monetary policy look easy—just change the money supply to move the economy to the best point possible
    • In fact, it isn’t so easy because of lags in the effect of policy and uncertainty about the ways monetary policy works
Monetary Control in the United States

• Making monetary policy in practice
  – Lags in the effects of monetary policy
    • It takes a fairly long time for changes in monetary policy to have an impact on the economy
    • Interest rates change quickly, but output and inflation barely respond in the first four months after the change in money growth (Fig. 14.8)
Figure 14.8 Responses of output, prices, and the Fed funds rate to a monetary policy shock
Monetary Control in the United States

- Making monetary policy in practice
  - Tighter monetary policy causes real GDP to decline sharply after about four months, with the full effect being felt about 16 to 20 months after the change in policy
  - Inflation responds even more slowly, remaining essentially unchanged for the first year, then declining somewhat
  - These long lags make it very difficult to use monetary policy to control the economy very precisely
  - Because of the lags, policy must be made based on forecasts of the future, but forecasts are often inaccurate
  - The Fed under Greenspan has made preemptive strikes against inflation based on forecasts of higher future inflation
Monetary Control in the United States

• Making monetary policy in practice
  – The channels of monetary policy transmission
    • Exactly how does monetary policy affect economic activity and prices? There are two effects discussed in the textbook so far; and a third new one
      – The interest rate channel: as seen in the IS-LM model, a decline in money supply raises real interest rates, reducing aggregate demand, leading to a decline in output and prices
      – The exchange rate channel: in an open economy, tighter monetary policy raises the real exchange rate, reducing net exports, and thus aggregate demand
      – The credit channel: tighter monetary policy reduces both the supply and demand for credit (see Box 14.1)
Monetary Control in the United States

• Making monetary policy in practice
  – The channels of monetary policy transmission
    • How important are these different channels?
      – Suppose real interest rates are high, but the dollar has been falling; is monetary policy tight or easy? It depends on the relative importance of the different channels
      – Or suppose real interest rates are low, but borrowing and lending are weak
Monetary Control in the United States

• Making monetary policy in practice
  – These practical difficulties make monetary policy “an art as well as a science”
Monetary Control in the United States

• Box 14.1: The credit channel of monetary transmission
  – The credit channel refers to the effects monetary policy has on the supply and demand for credit
  – On the supply side, tight monetary policy leads to reduced lending by banks
    • Tighter monetary policy reduces bank reserves, so banks can’t accept as many deposits
    • With fewer deposits, banks can’t lend as much
    • With fewer loans available, firms can’t obtain all the credit they want
    • So firms spend less on investment, reducing aggregate demand
Monetary Control in the United States

• Box 14.1: The credit channel of monetary transmission
  – On the demand side, tight monetary policy makes borrowers less credit-worthy
    • A firm with outstanding debt (with a floating interest rate, interest rate tied to the prime rate, or short-term loan) has to pay more interest when tight policy makes interest rates rise, so its costs go up and profits decline
    • With lower profits, the firm is more likely to go bankrupt, so banks will be less willing to make loans to it
    • Consumers who use stock as collateral for loans find that tighter monetary policy reduces stock values as investors switch from stocks to bonds, so their collateral is worth less and they can’t borrow as much
    • The overall effect is reduced spending on investment and consumption, leading the IS curve to shift down and to the left
Monetary Control in the United States

• Box 14.1: The credit channel of monetary transmission
  – Empirical evidence for the credit channel
    • On the supply side, the credit channel was powerful in the 1960s and 1970s, but has declined in importance recently because of deregulation in the banking sector and the elimination of most reserve requirements
Monetary Control in the United States

• Box 14.1: The credit channel of monetary transmission
  – Empirical evidence for the credit channel
    • On the demand side, the credit channel can be observed by noting that the spending of consumers and small firms is more sensitive to monetary policy than the spending of large firms
      – Consumers and small firms are financially riskier than large firms, so when monetary policy tightens they’re more likely to be disqualified from loans
      – The data show that after a tightening of monetary policy, small firms and consumers are more likely to go bankrupt and receive less credit than large firms
      – The quantitative importance of the credit channel, relative to the interest rate channel and exchange rate channel, remains controversial, but it appeared to play a major role in the recession of 1990–91
The Conduct of Monetary Policy: Rules Versus Discretion

- Monetarists and classical macroeconomists advocate the use of rules
  - Rules make monetary policy automatic, as they require the central bank to set policy based on a set of simple, prespecified, and publicly announced rules
  - Examples of rules
    - Increase the monetary base by 1% each quarter
    - Maintain the price of gold at a fixed level
The Conduct of Monetary Policy: Rules Versus Discretion

• Monetarists and classical macroeconomists advocate the use of rules
  – The rule should be simple; there shouldn’t be much leeway for exceptions
  – The rule should specify something under the Fed’s control, like growth of the monetary base, not something like fixing the unemployment rate at 4%, over which the Fed has little control
  – The rule may also permit the Fed to respond to the state of the economy
Most Keynesian economists support discretion

- Discretion means the central bank looks at all the information about the economy and uses its judgment as to the best course of policy.
- Discretion gives the central bank the freedom to stimulate or contract the economy when needed; it is thus called *activist*.
- Since discretion gives the central bank leeway to act, while rules constrain its behavior, why would anyone suggest that the central bank follow rules?
The Conduct of Monetary Policy: Rules Versus Discretion

• Box 14.2: The Taylor rule
  – John Taylor of Stanford University introduced a rule that allows the Fed to take economic conditions into account
  – The rule is
    \[ i = \pi + 0.02 + 0.5y + 0.5(\pi - 0.02), \]
    where \( i \) is the nominal Fed funds rate, \( \pi \) is the inflation rate over the last 4 quarters, \( y \) = the percentage deviation of output from full-employment output
The Conduct of Monetary Policy: Rules Versus Discretion

• Box 14.2: The Taylor rule
  – The rule works by having the real Fed funds rate \((i - \pi)\) respond to:
    • \(y\), the difference between output and full-employment output
    • \(\pi - 0.02\), the difference between inflation and its target of 2 percent
  – If either \(y\) or \(\pi\) increase, the real Fed funds rate is increased, causing monetary policy to tighten (and vice-versa)
The Conduct of Monetary Policy: Rules Versus Discretion

- **Box 14.2: The Taylor rule**
  - Taylor showed that the rule is similar to what the Fed does in practice
  - Taylor advocates the use of the rule as a guideline for policy, not something to be followed mechanically
The Conduct of Monetary Policy: Rules Versus Discretion

• The monetarist case for rules
  – Monetarism is an economic theory emphasizing the importance of monetary factors in the economy
  – The leading monetarist is Milton Friedman, who has argued for many years (since 1959) that the central bank should follow rules for setting policy
The Conduct of Monetary Policy: Rules Versus Discretion

• The monetarist case for rules
  – Friedman’s argument for rules comes from four main propositions
    • Proposition 1: Monetary policy has powerful short-run effects on the real economy. In the longer run, however, changes in the money supply have their primary effect on the price level
      – This proposition comes from Friedman’s research with Anna Schwartz on monetary history
      – Friedman and other monetarists think monetary policy is a main source of business cycles
The Conduct of Monetary Policy: Rules Versus Discretion

• The monetarist case for rules
  – Proposition 2: Despite the powerful short-run effect of money on the economy, there is little scope for using monetary policy actively to try to smooth business cycles
    • First, the information lag makes it difficult to know the current state of the economy
    • Second, monetary policy works with a long and variable lag, so it isn’t clear how to set policy quantitatively
    • Third, wage and price adjustment is fast enough that by the time a change in policy begins to affect the economy, it may be moving the economy in the wrong direction, thus destabilizing the economy
The Conduct of Monetary Policy: Rules Versus Discretion

• The monetarist case for rules
  – Proposition 3: Even if there is some scope for using monetary policy to smooth business cycles, the Fed cannot be relied on to do so effectively
    • Friedman believes the Fed responds to political pressure and tends to stimulate the economy in election years
    • Historically, monetary policy has tended to destabilize, rather than stabilize, the economy; so eliminating monetary policy as a source of instability would improve macroeconomic performance
The Conduct of Monetary Policy: Rules Versus Discretion

• The monetarist case for rules
  – Proposition 4: The Fed should choose a specific monetary aggregate (such as M1 or M2) and commit itself to making that aggregate grow at a fixed percentage rate every year
    • The Fed needs to give up activist, or discretionary, policy completely and follow a simple rule
    • Friedman prefers a constant money growth rule, since the money supply is controllable by the Fed and the Fed would not follow destabilizing monetary policies
    • To reduce inflation to zero, the money growth target should be gradually lowered over time
The Conduct of Monetary Policy: Rules Versus Discretion

• Rules and central bank credibility
  – New arguments for rules suggest that rules are valuable even if the central bank has a lot of information and forms policy wisely
    • The new arguments suggest that rules improve the credibility of the central bank
    • The credibility of the central bank influences how well monetary policy works
The Conduct of Monetary Policy: Rules Versus Discretion

• Rules and central bank credibility
  – Dad, the kids, and the game: credible threats and commitment
    • Dad wants to take the kids to a ballgame and the kids want to go, too
    • But the kids like to fight and Dad doesn’t like them fighting
    • To induce them not to fight, Dad says, “If you fight, we won’t go to the game”
The Conduct of Monetary Policy: Rules Versus Discretion

• Rules and central bank credibility
  – A *game theory* model can tell us whether the kids will fight or not and whether Dad will take them to the game or not; game theory explores situations (games) in which strategy is used by individuals (players) to achieve their goals, possibly at the expense of other players.
The Conduct of Monetary Policy: Rules Versus Discretion

- Rules and central bank credibility
  - First, the value of different actions is specified
    - For the kids, fighting is worth 1, not fighting 0, going to the game 2, not going to the game 0
    - For Dad, fighting is worth 0, not fighting 1, going to the game 2, not going to the game 0
  - This means the payoffs to the combinations of whether the kids fight or not and whether they all go to the game or not can be laid out as in Fig. 14.9
Figure 14.9 The game between Dad and the kids
The Conduct of Monetary Policy: Rules Versus Discretion

- Rules and central bank credibility
  - Dad’s statement isn’t credible, because he would be worse off if he followed it
    - If the kids fight and Dad follows through on not going to the game, he gets a payoff of 0
    - But if they fight and Dad backs down from his statement and takes them to the game anyway, Dad’s payoff is 2
    - Since the kids know that Dad will take them to the game whether they fight or not, and since they prefer to fight, they will fight
The Conduct of Monetary Policy: Rules Versus Discretion

- Rules and central bank credibility
  - Could Dad make his statement credible?
    - He could if he could commit himself somehow to following through
    - One possibility is to give the tickets to Mom, who doesn’t care if they go to the game, who could enforce Dad’s decision
    - Then both fighting and going to the game would not be possible, so the kids wouldn’t fight, since they prefer not fighting and going to the game over fighting and not going to the game
The Conduct of Monetary Policy: Rules Versus Discretion

- Rules and central bank credibility
  - A game between the central bank and firms (Fig. 14.10)
    - Consider a similar game between the central bank and firms
    - The inflation rate is 10% and the unemployment rate is 6%
    - The Fed tells firms that it will hold the money supply constant this year
    - Should the firms believe the Fed and hold prices constant, or should they doubt that the Fed will really hold the money supply constant, in which case they should raise prices?
Figure 14.10(a) The game between the Fed and the firms
Figure 14.10(b) The game between the Fed and the firms

<table>
<thead>
<tr>
<th>FED’S STRATEGY</th>
<th>FIRMS’ STRATEGY</th>
<th></th>
<th>POINT ASSIGNMENTS</th>
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<tr>
<td>Increase $M$</td>
<td>Raise $P$</td>
<td>Fed : 0</td>
<td>FIRMS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Firms : 2</td>
<td>0</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>$u = 6%$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outcome A</td>
<td>$\pi = 10%; u = 6%$</td>
</tr>
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<td>Don’t raise $P$</td>
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<td>1</td>
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<tr>
<td></td>
<td></td>
<td>Firms : 1</td>
<td>$u = 3%$</td>
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<td></td>
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<td></td>
<td>Outcome B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fed : -1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Firms : 0</td>
<td>$u = 9%$</td>
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<td>Outcome C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fed : 1</td>
<td>2</td>
</tr>
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<td></td>
<td></td>
<td>Firms : 3</td>
<td>$u = 10%$</td>
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<td></td>
<td></td>
<td></td>
<td>Outcome D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fed : -1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Firms : 0</td>
<td>$u = 0%; u = 6%$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$\pi = 0%$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fed : 1</td>
<td>1</td>
</tr>
<tr>
<td></td>
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<td>Firms : 1</td>
<td>$u &lt; \text{natural rate (3%)}$</td>
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<td>$u &gt; \text{natural rate (9%)}$</td>
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<td>Fed : 0</td>
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<td>Firms : 2</td>
<td>$u = \text{natural rate (6%)}$</td>
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<td>$\pi = 10%$</td>
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<tr>
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<td></td>
<td>Fed : -1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Firms : 0</td>
<td>$u = 6%$</td>
</tr>
</tbody>
</table>

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The Conduct of Monetary Policy: Rules Versus Discretion

- Rules and central bank credibility
  - A game between the central bank and firms
    - The payoffs
      - For firms, 0% inflation is worth 1, 10% inflation is worth 0; unemployment at the natural rate is worth 2, unemployment above or below the natural rate is worth 0
      - For the Fed, 0% inflation is worth 1, 10% inflation is worth 0; unemployment at the natural rate is worth 0, unemployment above the natural rate is worth –1, and unemployment below the natural rate is worth 1
The Conduct of Monetary Policy: Rules Versus Discretion

• Rules and central bank credibility
  – A game between the central bank and firms
    • If the Fed holds the money supply constant
      – If firms don’t raise prices, then inflation is zero and the $LM$ curve stays put, so unemployment remains at the natural rate
      – If firms raise prices, inflation is 10%, the $LM$ curve shifts up, and unemployment rises to 9%
The Conduct of Monetary Policy: Rules Versus Discretion

• Rules and central bank credibility
  – A game between the central bank and firms
    • If the Fed raises the money supply
      – If firms don’t raise prices, then inflation is zero and the $LM$ curve shifts down, so unemployment falls to 3%
      – If firms raise prices, inflation is 10%, the $LM$ curve stays put, and unemployment remains at the natural rate
The Conduct of Monetary Policy: Rules Versus Discretion

• Rules and central bank credibility
  – A game between the central bank and firms
    • The payoffs are such that if firms raise prices, the Fed is better off increasing $M$, so firms reason that the Fed’s threat isn’t credible
    • Further, if the firms didn’t raise prices, the Fed would increase the money supply, since its payoff is larger
    • So firms will increase prices and the Fed will increase the money supply, leading to inflation of 10% and unemployment of 6%
    • If the Fed’s statement not to raise the money supply was credible, however, then firms would choose not to raise prices and inflation would fall to zero, with unemployment remaining at the natural rate
The Conduct of Monetary Policy: Rules Versus Discretion

• Rules and central bank credibility
  – Rules, commitment, and credibility
    • How does a central bank (or a dad) gain credibility?
    • One way to get credibility is by building a reputation for following through on its promises, even if it’s costly in the short run
    • Another, less costly, way is to follow a rule that is enforced by some outside agency (Mom, for example)
The Conduct of Monetary Policy: Rules Versus Discretion

• Rules and central bank credibility
  – Rules, commitment, and credibility
    • Keynesians argue that there may be a trade-off between credibility and flexibility
      – To be credible, a rule must be nearly impossible to change
      – But if a rule can’t be changed, what happens in a crisis situation?
      – For example, if a rule is based on economic relationships that change suddenly, then the lack of flexibility may be very costly
      – So a rule may create unacceptable risks
The Conduct of Monetary Policy: Rules Versus Discretion

• Application: Monetary-growth targeting and inflation targeting
  – High unemployment and high inflation in the 1970s led central banks worldwide to experiment with alternative strategies for monetary policy, including targeting money growth and targeting inflation
The Conduct of Monetary Policy: Rules Versus Discretion

• Application: Monetary-growth targeting and inflation targeting
  – Money-growth targeting
    • Germany’s Bundesbank introduced money-growth targets in 1975 and used the strategy until the European Monetary Union began in 1999
      – The U.S., Canada, the U.K., Switzerland, and others also adopted money targets in the 1970s
    • Money-growth targeting means the central bank announces a money-growth rate that it will aim for over the next year or so
      – The idea is that by having money grow at the optimal rate, inflation and output will be at desired levels
      – Germany had been quite successful in targeting money growth
The Conduct of Monetary Policy: Rules Versus Discretion

• Application: Monetary-growth targeting and inflation targeting
  – Money-growth targeting
    • The United States began targeting money in 1975
      – But the Fed tried to target three monetary aggregates (M1, M2, and M3) all at the same time, and often missed its targets badly
The Conduct of Monetary Policy: Rules Versus Discretion

• Application: Monetary-growth targeting and inflation targeting
  – Money-growth targeting
    • Most countries that used money-growth targeting (including the United States) were able to reduce inflation in the early 1980s, but output and employment growth were often unstable
      – The Fed began to de-emphasize money-growth targeting in 1982 because of instability in money demand and moved gradually toward interest-rate targeting
      – Many other countries also weakened their reliance on money-growth targets in the 1980s, except for Germany and Switzerland
The Conduct of Monetary Policy: Rules Versus Discretion

- Application: Monetary-growth targeting and inflation targeting
  - Inflation targeting
    - Since 1990, some countries have switched from targeting money growth to targeting inflation
      - New Zealand was the pioneer, announcing explicit inflation targets that had to be met or else the central bank’s governor could be fired
      - Canada, the U.K., Sweden, Australia, Spain, and others followed with some version of inflation targeting
      - The new European Central Bank uses a method of inflation targeting that retains a role for money-growth targets
The Conduct of Monetary Policy: Rules Versus Discretion

• Application: Monetary-growth targeting and inflation targeting
  – Inflation targeting
    • Under inflation targeting, the central bank announces targets for inflation over the next 1 to 4 years
The Conduct of Monetary Policy: Rules Versus Discretion

• Application: Monetary-growth targeting and inflation targeting
  – Inflation targeting
    • Advantages of inflation targeting over money-growth targeting
      – It avoids the problem of instability in money demand
      – It’s easy to explain inflation targets to the public (since they understand what inflation is) than money-growth targeting (which most people don’t understand)
      – Better communication of the central bank’s goals will reduce uncertainty about what the central bank will do and may increase the bank’s accountability
The Conduct of Monetary Policy: Rules Versus Discretion

- Application: Monetary-growth targeting and inflation targeting
  - Inflation targeting
    - Disadvantages of inflation targeting relative to money-growth targeting
      - Inflation responds to policy actions with a long lag, so it’s hard to judge what policy actions are needed to hit the inflation target and hard for the public to tell if the central bank is doing the right thing
      - Thus central banks may miss their targets badly, losing credibility
The Conduct of Monetary Policy: Rules Versus Discretion

• Other ways to achieve central bank credibility besides targeting money growth or inflation
  – Appointing a “tough” central banker
    • Appointing someone who has a well-known reputation for being tough in fighting inflation may help establish credibility for the central bank
    • For example, in 1979 the appointment of Paul Volcker to be chairman of the Fed was designed to convince people that President Carter was serious about stopping inflation
    • Even in Volcker’s case, however, disinflation proved to be costly
The Conduct of Monetary Policy: Rules Versus Discretion

- Other ways to achieve central bank credibility besides targeting money growth or inflation
  - Changing central bankers’ incentives
    - People are more likely to believe a central bank is serious about disinflation if it has the incentive to care a lot about inflation
    - In New Zealand, for example, the head of the central bank must be replaced if inflation targets aren’t met; as a result, inflation was reduced significantly, but at a cost of higher unemployment
The Conduct of Monetary Policy: Rules Versus Discretion

- Other ways to achieve central bank credibility besides targeting money growth or inflation
  - Increasing central bank independence
    - If the executive and legislative branches of government can’t interfere with the central bank, people are more likely to believe that the central bank is committed to keeping inflation low and won’t cause a political business cycle
    - Looking at evidence across countries (text Fig. 14.11), Alesina and Summers showed that the more independent the central bank, the lower the inflation rate from 1955 to 1988; also, the long-run level of unemployment is no higher in those countries
Figure 14.11 Central bank independence and inflation, 1955-1988