Chapter 12

• The Money Market and Monetary Policy
The Demand For Money

• How much money people want to hold
  – Given their constraints

• An individual’s demand for money
  – Quantity of money demanded
    • Wealth – held as money, not as other assets
    • Saving accounts, stocks, bonds
  – Opportunity cost
    • Interest
An Individual’s Demand for Money

- Divide wealth among different assets
  - **Money**
    - Means of payment
    - Earns no interest
  - **Saving accounts, bonds**
    - Earn interest
    - Not means of payment.
  - **Stocks**
    - Earn dividends
    - Not means of payment
  - **Assumption: only two assets**
    - Money and Bonds
An Individual’s Demand for Money

- Individuals hold more money
  - Higher price level
  - Higher real income (purchasing power)

- Individuals hold less money
  - Higher interest rate
The Demand for Money by Businesses

• Businesses hold money
  – Currency in their cash registers
  – Business checking accounts

• Businesses hold more money
  – Higher real income
  – Higher price level

• Businesses hold less money
  – Higher interest rate
The Economy-Wide Demand For Money

• Quantity of money demanded
  – Households and Businesses

• Increase money demand
  – Price level increases
  – Real income (real GDP) increases

• Decrease quantity of money demanded
  – Rise in the interest rate

• Consider Figure 1
The money demand curve is drawn for a given real GDP and a given price level.

At an interest rate of 6 percent, $1,000 billion of money is demanded.

If the interest rate drops to 3 percent, the quantity of money demanded increases to $1,600 billion.
The Money Demand Curve

• Movement along
  – A change in the interest rate

• Shifts in the Money Demand Curve
  – Change in money demand caused by something other than the interest rate
    • Real income
    • Price level
Shifts vs. Movements Along the M^d Curve

**Figure 2** Shifts and Movements Along the Money Demand Curve

- Interest rate ↑ moves us leftward along the money demand curve.
- Interest rate ↓ moves us rightward along the money demand curve.

Entire money demand curve shifts rightward if the price level or income increases.
The Supply of Money

- Controlled by the Fed
- Doesn’t change with the interest rate
- Money supply curve
  - Total quantity of money in the economy at each interest rate
  - Vertical line
- Consider Figure 3
The Supply of Money

• **Figure 3** The Supply of Money

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Interest Rate

6%
3%

M₁

E

J

1,400
1,000

Money ($ billions)

M₂

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The Supply of Money

• Rightward shift
  – Open market purchases
  – Inject reserves into the banking system,

• Leftward shift
  – Open market sales
  – Withdraw reserves
Equilibrium in the Money Market

- Occurs when
  - Quantity of money people are actually holding
    • Either in cash or checking account balances
    • Quantity supplied
  - Is equal to the quantity of money people want to hold
    • Quantity demanded
- Consider Figure 4
At the equilibrium interest rate of 6%, the public is content to hold the quantity of money it is actually holding.

At a higher interest rate, an excess supply of money causes the interest rate to fall.

At a lower interest rate, an excess demand for money causes the interest rate to rise.
How Money Market Reaches Equilibrium

- Excess supply of money
  - Money supply > Quantity demanded
  - Excess demand for bonds
    - Amount of bonds demanded > amount supplied
How Money Market Reaches Equilibrium

- Excess demand of money
  - Money supply < Quantity demanded
- Excess supply of bonds
  - Amount of bonds demanded < amount supplied
Bond Prices and Interest Rates

• Bond
  – Promise to pay back borrowed funds
  – At a certain date/dates in the future

• Large corporation or government
  – Needs to borrow money
  – Issue a new bond
  – Sells it in the marketplace
  – Negative relationship: Price of bonds and interest rate
  – Secondary market for bonds
What Happens When Things Change?

• The Fed wants to lower the interest rate
  – Open market purchases
  – Increase the money supply
  – Change the equilibrium interest rate
An Increase in the Money Supply

At point $E$, the money market is in equilibrium at an interest rate of 6 percent.

To lower the interest rate, the Fed could increase the money supply to $1,600 billion.

The excess supply of money (and excess demand for bonds) would cause bond prices to rise, and the interest rate to fall until a new equilibrium is established at point $F$ with an interest rate of 3 percent.
What Happens When Things Change?

- The Fed - increase the interest rate
  - Open market sales
  - Decrease the money supply
  - Change the equilibrium interest rate
Interest Rate Changes - Affect the Economy

- Fed increases the money supply
  - Interest rate falls
  - Spending increases
    - plant and equipment
    - new housing
    - consumer durables

- Fed decreases the money supply
  - Interest rate rises
  - Spending falls
Monetary Policy

- Control or manipulation of money supply
- By the Fed
- To achieve a macroeconomic goal
Monetary Policy

Figure 6 Monetary Policy and the Economy

Interest Rate

Real Aggregate Expenditures ($ trillions)

Money ($ billions)

Real GDP ($ billions)

M_s^1 M_s^2

M^d

A
B

6%

3%

1,000 1,600

AE_{r=3%}

AE_{r=6%}

F

E

45°

8,000 10,000

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Monetary Policy in Practice

• Federal funds rate
  – Interest rate charged for loans of reserves among banks

• The Fed – targets the federal funds rate
  – Other interest rates move in the same direction

• The Fed adjusts money supply
  – Maintain interest rate target or
  – Change the interest rate target
  – To prevent recession
  – Help the economy
Maintaining an Interest Rate Target

• Start from full-employment
• Public preferences change
  – Money demand increases
  – Effect on interest rate
  – Effect on GDP
• Fed takes some action
  – Adjusts money supply
Maintaining an Interest Rate Target

- **Figure 7** Maintaining an Interest Rate Target

![Graph showing the relationship between interest rate, money supply, and real aggregate expenditures.](image)

- Interest Rate
  - $M^s_1$
  - $M^s_2$

- Real Aggregate Expenditures ($\text{trillions}$)
  - Money ($\text{billions}$)
  - 1,000
  - 1,400

- $5\%$
- $8\%$

- $A$, $B$, $C$

- $AE_{r=5\%}$

- $45^\circ$

- $10,000$

- Real GDP ($\text{billions}$)

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Changing the Interest Rate Target

- Start from full-employment
- Spending changes
  - Pessimism about future
  - Effect on GDP
- Fed takes some action
  - Adjusts money supply
- In practice
  - Fed uses a trial-and-error procedure
Changing the Interest Rate Target

**Figure 8** Changing the Interest Rate Target to Prevent a Recession

The graph illustrates the impact of changing the interest rate target on the economy. The graphs depict the relationship between interest rate, real aggregate expenditures, money supply, and real GDP.

- **Figure 8** shows the effect of adjusting the money supply to prevent a recession. The graph compares two money supply scenarios, $M^s_1$ and $M^s_2$, and demonstrates how changing the interest rate target can influence real aggregate expenditures and real GDP.

- The left graph plots interest rate against money supply, with points A and C indicating different interest rates and money supplies.

- The right graph shows real aggregate expenditures on the y-axis and real GDP on the x-axis, with points E and F representing the impact on the economy.

- The 45° line represents the equality of real GDP and aggregate expenditures, highlighting the target for economic balance.

- The adjustment in the interest rate target from 5% to 3% results in a shift from point A to point C, leading to an increase in real aggregate expenditures and a potential stabilization of real GDP.

This analysis underscores the importance of policy adjustments in maintaining economic stability.
Two Theories of the Interest Rate

- How is the interest rate determined?
- Market for loanable funds
  - Long-run
  - Household saving - lent to businesses and government
- Money market
  - Short-run
  - Wealth holders: money and bonds
  - The Fed - controls the money supply
Appendix: Feedback Effects

- Feedback effects
  - From income to the money market
- A change in the money supply
  - Smaller change in the interest rate
- A increase in the money supply
  - Lower interest rate
  - Higher real GDP
  - Higher money demand
Appendix: Feedback Effects

**Figure A.1 A More Complete View of Monetary Policy**

- **Interest Rate**
  - $M_s^1$
  - $M_s^2$
  - $M_d^{Y=8,000 \text{ billion}}$
  - $M_d^{Y=9,000 \text{ billion}}$

- **Real Aggregate Expenditures ($ trillions)**
  - $AE_r=6\%$
  - $AE_r=4.5\%$

- **Money ($ billions)**
  - 1,000
  - 1,600

- **Real GDP ($ billions)**
  - 8,000
  - 9,000
Appendix: More Complete View of Fiscal Policy

- Short run - increase in G
  - Increase in real GDP
  - Increase in money demand
  - Increases the interest rate
  - Crowds out
    - Investment spending
    - Some consumption spending
  - Smaller increase in real GDP
Appendix: More Complete View of Fiscal Policy

**Figure A.2 Fiscal Policy and the Money Market**

<table>
<thead>
<tr>
<th>Money (trillions)</th>
<th>Real Aggregate Expenditures (trillions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$8,000 billion</td>
<td>$8,000 billion</td>
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<tr>
<td>$9,000 billion</td>
<td>$9,000 billion</td>
</tr>
</tbody>
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**Money Market Diagram**

- **Ms**: Money supply curve
- **Md**: Money demand curve
- **A**: Point where Money Demand = Money Supply
  - Interest Rate: 6%
  - Real GDP: $8,000 billion
- **B**: Point where Money Demand = Money Supply
  - Interest Rate: 8%
  - Real GDP: $9,500 billion

**Real GDP**

- **AEr=6%**: Real GDP at 6%
- **AEr=8%, greater G**: Real GDP at 8%, with greater government spending