Chapter 11: Monetary System

Instructions: These are the notes for Chapter 11. Make sure you review the material presented here and read the corresponding chapters on the textbook: **Chapter 21 on Mankiw.**

- **Barter.** Exchange of one good or service for another.
  - Was the only method used until Lydians first used money (coins) in 700 B.C.

Barter: Problems

- Barter requires a **double coincidence of wants.**
  - Two people have to want each others goods or services.
- People spend significant time searching for others to trade with.
  - Waste of scarce resources: time!
- Money fixes the double coincidence of wants problem!

The Three Functions of Money

1. **Medium of exchange:** Buyers give money to sellers when they want to purchase goods and services.
   - Solves the barter problems!
2. **Unit of account:** Makes measuring monetary value of goods and services easy.
   - Easy comparisons: \$10 vs. \$2000.
3. **Store of value:** You can hold onto your money today and spend it tomorrow: does not perish (except for inflation).

Two Types of Money

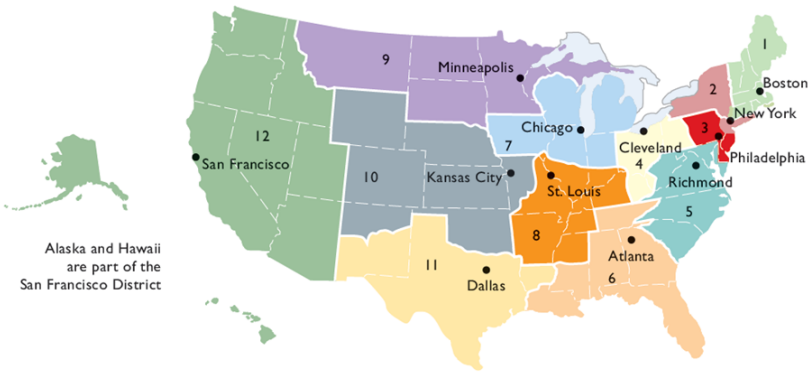
1. **Commodity Money:** Money that takes the form of a commodity with intrinsic value.
    - Intrinsic: has value even not used as money.
    - E.g. gold coins, cigarettes in prisons.
2. **Fiat Money:** Money without intrinsic value, used as money because of government decree.
    - E.g. the U.S. dollar.

Central Bank and Monetary Policy

- **Monetary system** is the mechanism that provides money to a country's economy.
    - Where money comes from: the central bank!
- **Central bank** is an institution that oversees the banking system and regulates the money supply.
    - The Federal Reserve (FED) is the central bank of the U.S.
    - Other examples include Bank of England, European Central Bank..
- FED has two very important jobs
    - Controlling **the money supply (quantity of money)** in the economy: called **monetary policy.**
    - Oversee other banks and act as a "lender of last resort", i.e. provide money to struggling banks.

The Federal Reserve

- The Federal Reserve System consists of:
    - Board of Governors (7 members), located in Washington, DC
    - 12 regional Fed banks, located around the U.S.
    - Federal Open Market Committee (FOMC), includes the Board of Governors and the presidents of some of the regional Fed banks.
    - The FOMC decides the monetary policy.



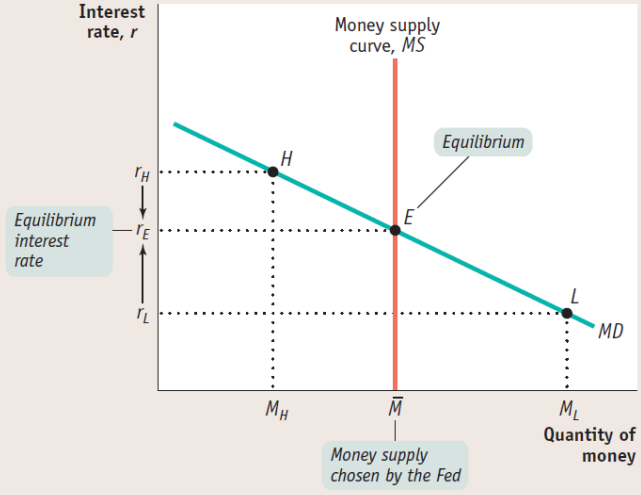
- The Federal Reserve Banks are a blend of private and public control: Quasi-Public Banks
  - Owned by private commercial banks in its district.
  - But the Board of Governors is an independent, quasi-government body
  - Not motivated by profit, does not deal with public
  - Bankers' bank: where banks go to get loans and deposit funds

Monetary Policy: Money Market

Equilibrium in the Money Market

The money supply curve, MS, is vertical at the money supply chosen by the Federal Reserve, $\overline{M}$. The money market is in equilibrium at the interest rate r_E: *the quantity of money demanded by the public is equal to* $\overline{M}$, the quantity of money supplied.

At a point such as L, the interest rate, r_L, is below r_E and the corresponding quantity of money demanded, M_L, exceeds the money supply, $\overline{M}$. In an attempt to shift their wealth out of nonmoney interest-bearing financial assets and raise their money holdings, investors drive the interest rate up to r_E. At a point such as H, the interest rate r_H exceeds r_E and the corresponding quantity of money demanded, M_H, is less than the money supply, $\overline{M}$. In an attempt to shift out of money holdings into nonmoney interest-bearing financial assets, investors drive the interest rate down to r_E.



Monetary Policy

- In general, FED can alter the money supply using its three main monetary policy tools
  1. Changing the required reserve ratio (rrr)
  2. Open market operations
  3. Changing the discount rate

1. Changing the rrr

- **The required reserve ratio (rrr)** is the fraction of deposits that banks must hold as reserves.
- Banks can loan out more money than the deposits received. How much more: set by the rrr.
- Example: Bank X receives a \$1,000 deposit, and the rrr is 10%.
  - Bank X can keep \$100 in reserve and loan out the remaining \$900 to others who want to borrow from Bank X.
  - In the economy, there is \$1,900 circulating now: \$1,000 owned by the depositor + \$900 with the borrower.
  - Theoretically, this borrower can go to Bank Y, and deposit the \$900. In this case, Bank Y keeps $\$900 \times 0.1 = \$90$ in reserves, and can loan out \$810 to other borrowers.
  - There is now $\$1{,}900 + \$810 = \$2{,}710$ circulating in the economy.
  - The process continues and eventually the amount of money circulating in the economy becomes $\$1{,}000 \times 1/\text{rrr} = \$10{,}000$, where $1/\text{rrr}$ is **the money multiplier.**
  - At max: A \$1,000 deposit creates \$10,000. At min: creates no extra money (if the bank does not loan out any portion of the deposit).
- FED can alter the amount of money circulating in the economy (money supply) by changing the rrr!
  - E.g. increasing the rrr decreases the money multiplier ($1/\text{rrr}$) hence less money circulating.

2. Open Market Operations

- **Open market purchase** of treasury securities is a tool that is used by the central bank in which the central bank purchases treasury securities (bonds) from the private banks and pays money these banks for the securities.
  - Treasury securities (bonds) are essentially the government's debt, paying a fixed amount of interest to its holder.
  - Remember FED and the government are two separate entities!

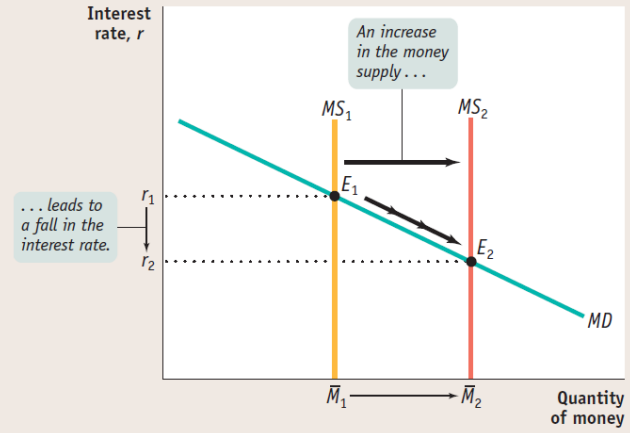
3. Changing the discount rate

- FED lends money to private banks at an interest rate called the **discount rate.**
- FED can lower the discount rate, which would encourage private banks to borrow more from FED to lend it to other private banks at a higher interest rate, increasing the money circulating in the economy.

Expansionary Monetary Policy

The Effect of an Increase in the Money Supply on the Interest Rate

The Federal Reserve can lower the interest rate by increasing the money supply. Here, the equilibrium interest rate falls from r_1 to r_2 in response to an increase in the money supply from $\overline{M}_1$ to $\overline{M}_2$. In order to induce people to hold the larger quantity of money, the interest rate must fall from r_1 to r_2.



- An increase in the money supply lowers the interest rate, r! At lower interest rates, investment goes up as it becomes cheaper to borrow money, hence GDP goes up!
- Side effect: **inflation!**

Fiscal Policy

- **Fiscal policy** is a tool used by the government in which the government intervenes in the economy by increasing/decreasing the government spending, or taxation.
  - The government: the president and the congress, not FED!

$$Y = C + I + G + NX \tag{1}$$

- Increase in G: increasing spending on goods and services like highways, bridges, schools, national defense, teachers, FBI agents, government employees..
- **Multiplier effect** also comes into play, where the increase in G creates further increases in C.
  - E.g. If the government buys $20 billion worth of planes from Boeing, Boeing's revenue increases by $20 billion. This $20 billion is distributed to Boeing's workers (as wages) and owners (as profits or stock dividends). These people are also consumers and will spend a portion of this extra income, hence C goes up.
- The caveat: the government has to somehow finance its spending!

$$Budget = T - G \tag{2}$$

- Either raise taxes, or borrow more!
- The consequence of raising taxes: crowding-out!

  - **Crowding-out** is the decrease in the private investment and GDP due to the distortionary effects of taxation.

- Borrowing too much causes a budget deficit! This means the government would only be able to borrow at higher interest rates.

Summary

- Money serves three functions: medium of exchange, unit of account, and store of value.
- There are two types of money: commodity money has intrinsic value; fiat money does not.
- The Federal Reserve is the central bank of the U.S. The Fed decides on the monetary policy: open-market operations, rrr, and discount rate.
- An increase in the money supply causes the interest rate to fall, which stimulates investment and increases GDP.
- The government decides on the fiscal policy: increasing or decreasing the government spending/taxes.
  - The multiplier effect tends to amplify the effects of fiscal policy.
  - The crowding-out effect tends to dampen the effects of fiscal policy.