The Monetary System

PRINCIPLES OF
Economics
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Lecture 7

In this chapter, look for the answers to these questions:

- What assets are considered “money”? What are the functions of money? The types of money?
- What is the Federal Reserve?
- What role do banks play in the monetary system? How do banks “create money”?
- How does the Central Bank (e.g., the Federal Reserve of U.S.A.) control the money supply?

(1) What Is Money & Why Do We (the Economy) Need It?

Dollar bills and bank checks are pieces of paper that have no (or minimal) value in and of themselves. Why do you consider them valuable?

Characteristics of money

Roles of money in the economy (Could an economy function without money?)

What Is Money & Why Do We (the Economy) Need It?

- Without money, trade would require **barter**, the exchange of one good or service for another.
- Every transaction would require a **double coincidence of wants** – the unlikely occurrence that two people each have a good the other wants.
- Most people would have to spend time searching for others to trade with – a huge waste of resources.
- This searching is unnecessary with **money**, the set of assets that people regularly use to buy g&s from other people.

The 3 Functions of Money

- **Medium of exchange**: an item buyers give to sellers when they want to purchase g&s
- **Unit of account**: the yardstick people use to post prices and record debts
- **Store of value**: an item people can use to transfer purchasing power from the present to the future

The 2 Kinds of Money

Commodity money:
takes the form of a commodity with intrinsic value

Examples: gold coins, cigarettes in POW camps

Fiat money:
money without intrinsic value, used as money because of government decree

Example: US dollar, Taka etc

The Money Supply

- The **money supply** (or **money stock**):
  the quantity of money available in the economy
- What assets should be considered part of the money supply? Two candidates:
  - **Currency**: the paper bills and coins in the hands of the (non-bank) public
  - **Demand deposits**: balances in bank accounts that depositors can access on demand by writing a check

(2) Central Bank

- **Central bank**: an institution that oversees the banking system and regulates the money supply
- **Monetary policy**: the setting of the money supply by policymakers in the central bank
- **Federal Reserve (Fed)**: the central bank of the U.S.
- Bangladesh Bank (BB): the central bank of Bangladesh

(3) Banking System and the Money Supply

Bank Reserves

- In a **fractional reserve banking system**, banks keep a fraction of deposits as **reserves** and use the rest to make loans.
- The Central Bank (CB) establishes **reserve requirements**, regulations on the minimum amount of reserves that banks must hold against deposits.
- Banks may hold more than this minimum amount if they choose.
- The **reserve ratio**, ***R***
  - = fraction of deposits that banks hold as reserves
  - = total reserves as a percentage of total deposits

Bank T-account

- To understand how banks create money, we need to briefly examine a typical bank balance sheet.
- A balance sheet lists a firm's **assets** on the left and its **liabilities** and stockholders' equity (net worth) on the right.

- The key assets on a bank's balance sheets are its *reserves*, *loans* and holdings of securities (such as US Treasury bills).
- A loan is an asset to a bank because it represents a promise by the person taking out the loan to make certain specified payments to the bank.

Bank T-account

- **T-account**: a simplified accounting statement that shows a bank's assets & liabilities.
- Example:

FIRST NATIONAL BANK			
Assets		**Liabilities**	
Reserves	$ 10	Deposits	$100
Loans	$ 90		

- Banks' liabilities include deposits, assets include loans & reserves.
- In this example, notice that ***R*** = \$10/\$100 = 10%.

Banks and the Money Supply: An Example

Suppose $100 of currency is in circulation.

To determine banks' impact on money supply,
we calculate the money supply in 3 different cases:

1. No banking system
2. 100% reserve banking system:
   banks hold 100% of deposits as reserves,
   make no loans
3. Fractional reserve banking system

Banks and the Money Supply: An Example

CASE 1: No banking system

Public holds the $100 as currency.

Money supply = Currency + Deposits = $100.

Banks and the Money Supply: An Example

CASE 2: 100% reserve banking system

Public deposits the $100 at First National Bank (FNB).

FNB holds 100% of deposit as reserves:

FIRST NATIONAL BANK

Assets		Liabilities	
Reserves	$100	Deposits	$100
Loans	$ 0		

Money supply
= currency + deposits = $0 + $100 = $100

In a 100% reserve banking system, banks do not affect size of money supply.

Banks and the Money Supply: An Example

CASE 3: Fractional reserve banking system

Suppose ***R*** = 10%. FNB loans all but 10% of the deposit:

FIRST NATIONAL BANK				
Assets			**Liabilities**	
Reserves	$	10	Deposits	$100
Loans	$	90		

Money supply = C + D = $190 (!!!)

Depositors have $100 in deposits,

Borrowers have $90 in currency.

Banks and the Money Supply: An Example

CASE 3: Fractional reserve banking system

How did the money supply suddenly grow?

When banks make loans, they create money.

The borrower gets

- $90 in currency (an asset counted in the money supply)
- $90 in new debt (a liability)

A fractional reserve banking system creates money or liquidity (larger amount of assets that can be used as medium of exchange), but not wealth.

Banks and the Money Supply: An Example

CASE 3: Fractional reserve banking system

Suppose borrower deposits the $90 at Second National Bank (SNB).

Initially, SNB's T-account looks like this:

SECOND NATIONAL BANK

Assets			Liabilities	
Reserves	$	9	Deposits	$ 90
Loans	$	81		

If ***R*** = 10% for SNB, it will loan all but 10% of the deposit.

Banks and the Money Supply: An Example

CASE 3: Fractional reserve banking system

The borrower deposits the $81 at Third National Bank (TNB).

Initially, TNB's T-account looks like this:

THIRD NATIONAL BANK

Assets		Liabilities	
Reserves	$ 8.10	Deposits	$ 81
Loans	$72.90		

If ***R*** = 10% for TNB, it will loan all but 10% of the deposit.

Banks and the Money Supply: An Example

CASE 3: Fractional reserve banking system

The process continues, and money is created with each new loan.

Original deposit	=	$ 100.00
FNB lending	=	$ 90.00
SNB lending	=	$ 81.00
TNB lending	=	$ 72.90
⋮		⋮
Total money supply	=	$1000.00

In this example, $100 of reserves generates $1000 of money.

The Money Multiplier

- **Money multiplier**: the amount of money the banking system generates with each dollar of reserves
- The money multiplier equals 1/***R***.
- In our example,

  R = 10%

  money multiplier = 1/***R*** = 10

  $100 of reserves creates $1000 of money

Case Study: Bank Runs and the Money Supply

- A **run on banks**:
  When people suspect their banks are in trouble, they may "run" to the bank to withdraw their funds, holding more currency and less deposits.
- Under fractional-reserve banking, banks don't have enough reserves to pay off ALL depositors, hence banks may have to close.
- Also, banks may make fewer loans and hold more reserves to satisfy depositors.
- These events increase ***R***, reverse the process of money creation, cause money supply to fall.

Case Study: Bank Runs and the Money Supply

- During 1929-1933, a wave of bank runs and bank closings caused money supply in USA to fall 28%.
- Many economists believe this contributed to the severity of the Great Depression.
- Since then, **deposit insurance policy** has helped prevent bank runs
- In the U.K., though, Northern Rock bank experienced a classic bank run in 2007 and was eventually taken over by the British government.

(4) The Fed's Tools of Monetary Control

The Fed's 3 Tools of Monetary Control

1. **Open-Market Operations (OMOs)**: the purchase and sale of government bonds (e.g., U.S. treasury bills) by the CB (e.g., the Fed).

- To increase money supply, Fed buys government bonds, paying with new dollars.

  …which are deposited in banks, increasing reserves

  …which banks use to make loans, causing the money supply to expand.

- To reduce money supply, Fed sells government bonds, taking dollars out of circulation, and the process works in reverse.

The Fed's 3 Tools of Monetary Control

1. **Open-Market Operations (OMOs)**: the purchase and sale of U.S. government bonds by the Fed.

- OMOs are easy to conduct, and are the Fed's monetary policy tool of choice.

The Fed's 3 Tools of Monetary Control

2. Reserve Requirements (RR):
affect how much money banks can create by making loans.

- To increase money supply, Fed reduces RR.

  Banks make more loans from each dollar of reserves, which increases money multiplier and money supply.

- To reduce money supply, Fed raises RR,
  and the process works in reverse.

- Fed rarely uses reserve requirements to control money supply: Frequent changes would disrupt banking.

The Fed's 3 Tools of Monetary Control

3. The Discount Rate:
the interest rate on loans the Fed makes to banks

- When banks are running low on reserves, they may borrow reserves from the Fed.
- To increase money supply, Fed can lower discount rate, which encourages banks to borrow more reserves from Fed.
- Banks can then make more loans, which increases the money supply.
- To reduce money supply, Fed can raise discount rate.

The Fed's 3 Tools of Monetary Control

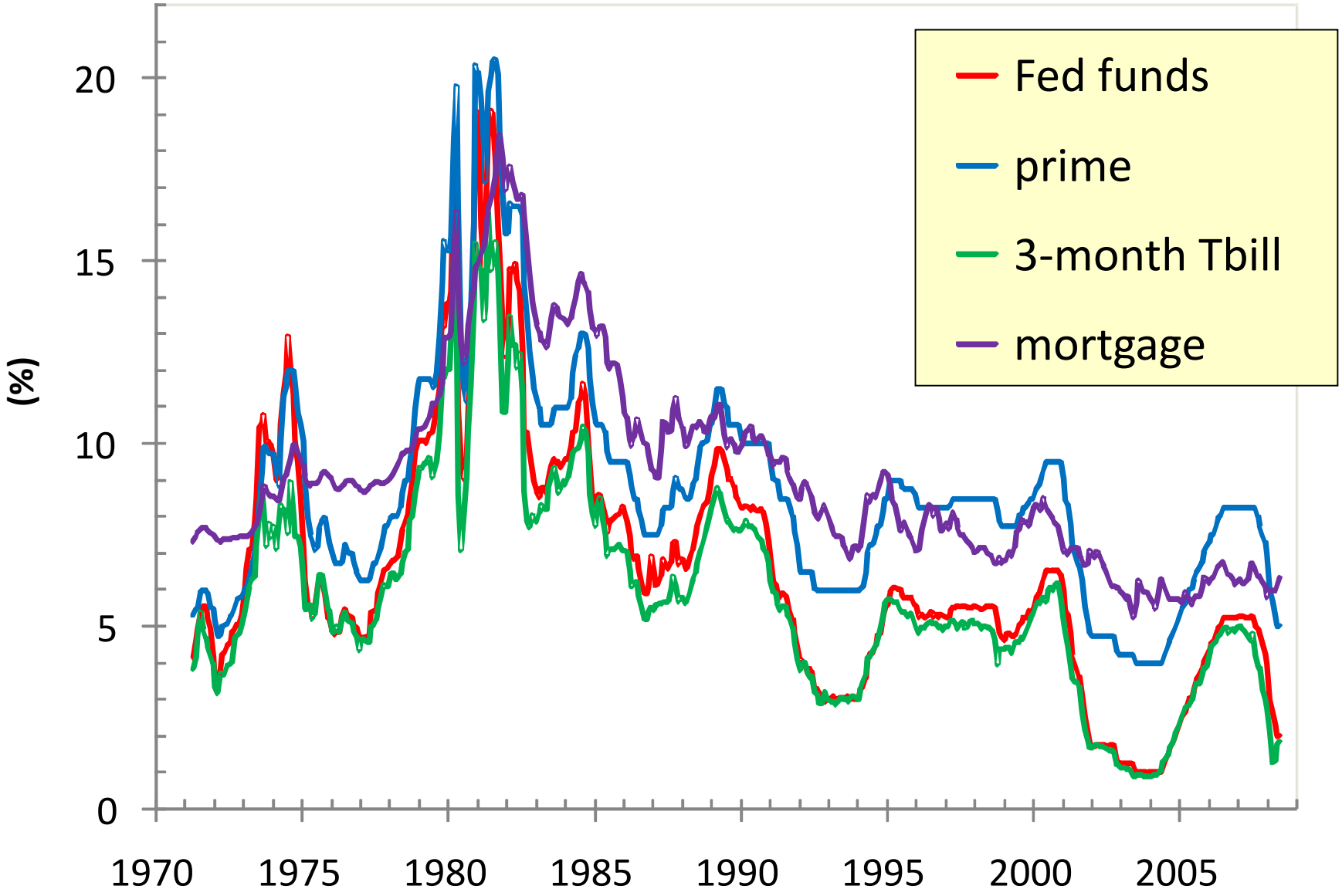
3. The Discount Rate:
the interest rate on loans the Fed makes to banks

- The Fed uses discount lending to provide extra liquidity when financial institutions are in trouble,
  e.g. after the Oct. 1987 stock market crash.
- If no crisis, Fed rarely uses discount lending –
  Fed is a **"lender of last resort."**

The Federal Funds Rate

- On any given day, banks with insufficient reserves can borrow from banks with excess reserves.
- The interest rate on these loans is the **federal funds rate**.
- The FOMC uses OMOs to target the fed funds rate.
- Many interest rates are highly correlated,
  so changes in the fed funds rate cause changes in other rates and have a big impact in the economy.

The Fed Funds Rate and Other Rates, 1970-2008

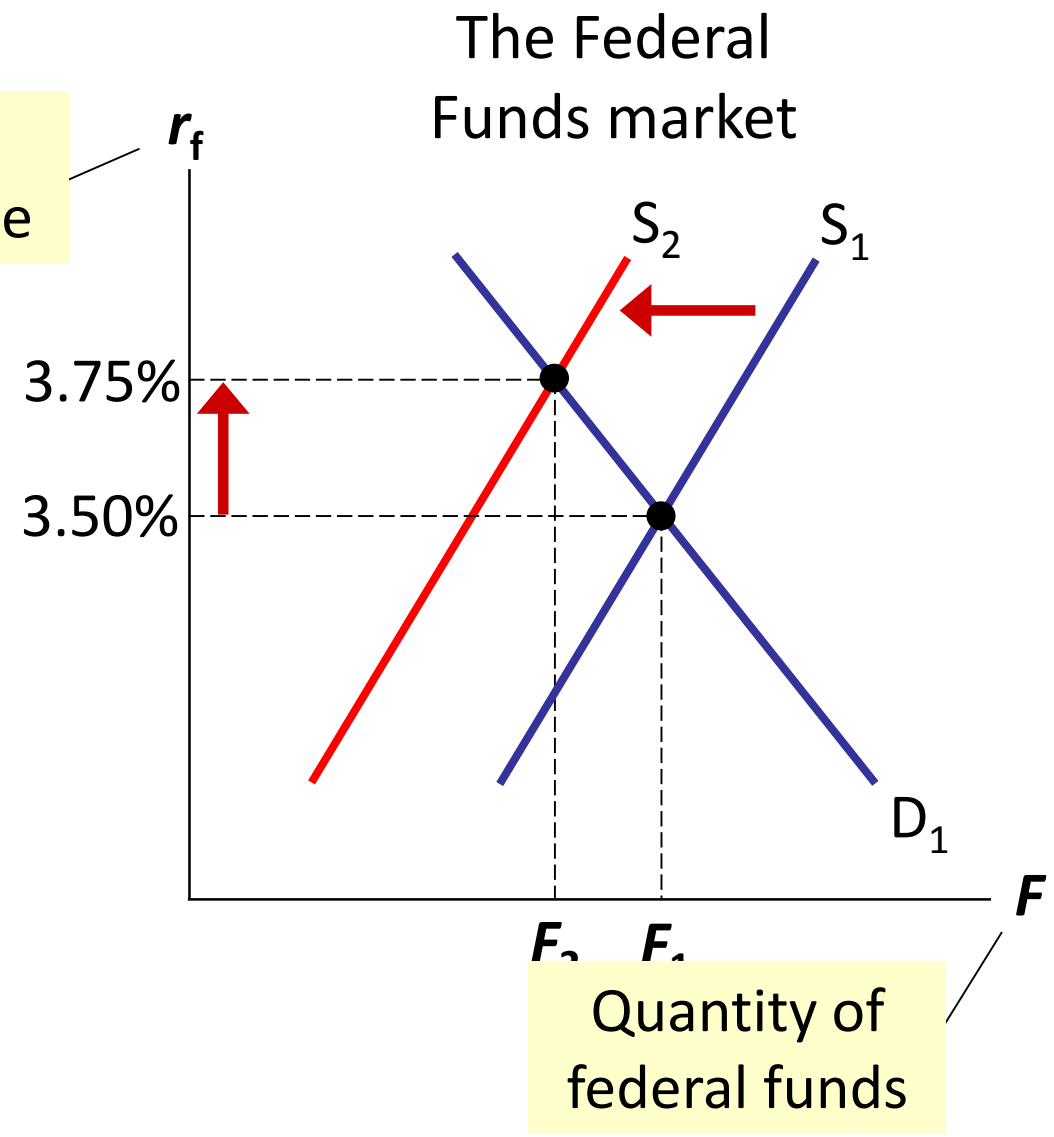


Monetary Policy and the Fed Funds Rate

To raise fed funds rate, Fed sells govt bonds (OMO).

This removes reserves from the banking system, reduces supply of federal funds,

causes r_f to rise.



CHAPTER SUMMARY

- Money includes currency and various types of bank deposits.
- The Federal Reserve is the central bank of the U.S., is responsible for regulating the monetary system.
- The Central Bank controls the money supply mainly through open-market operations. Purchasing government bonds increases the money supply, while selling government bonds decreases it.

CHAPTER SUMMARY

- In a fractional reserve banking system, banks create money when they make loans. Bank reserves have a multiplier effect on the money supply.