29 The Monetary System

PRINCIPLES OF

ECONOMICS

FOURTH EDITION

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PowerPoint® Slides
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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 Federal Reserve control the money supply?

What Money Is, and Why It's Important

- 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 govt decree

Example: the U.S. dollar

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? Here are 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

Measures of the U.S. Money Supply

- **M1**: currency, demand deposits, traveler's checks, and other checkable deposits.

  M1 = $1.4 trillion (October 2005)

- **M2**: everything in M1 plus savings deposits, small time deposits, money market mutual funds, and a few minor categories.

  M2 = $6.6 trillion (October 2005)

The distinction between M1 and M2 will usually not matter when we talk about "the money supply" in this course.

Central Banks & Monetary Policy

- **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.

The Structure of the Fed

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 Bd of Govs and presidents of some of the regional Fed banks The FOMC decides monetary policy.

Alan Greenspan
Chair of FOMC,
Aug 1987 – Jan 2006

Bank Reserves

- In a **fractional reserve banking system**, banks keep a fraction of deposits as **reserves**, and use the rest to make loans.
- The Fed 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

- **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 = $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 = $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, 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 generate $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

ACTIVE LEARNING 1:
Exercise

While cleaning your apartment, you look under the sofa cushion find a $50 bill (and a half-eaten taco). You deposit the bill in your checking account.

The Fed's reserve requirement is 20% of deposits.

A. What is the maximum amount that the money supply could increase?

B. What is the minimum amount that the money supply could increase?

ACTIVE LEARNING 1:
Answers

You deposit $50 in your checking account.

A. What is the maximum amount that the money supply could increase?

If banks hold no excess reserves, then
money multiplier = $1/R = 1/0.2 = 5$

The maximum possible increase in deposits is
5 x $50 = $250

But money supply also includes currency, which falls by $50.

Hence, max increase in money supply = $200.

ACTIVE LEARNING 1:
Answers

You deposit $50 in your checking account.

A. What is the maximum amount that the money supply could increase?

Answer: $200

B. What is the minimum amount that the money supply could increase?

Answer: $0

If your bank makes no loans from your deposit, currency falls by $50, deposits increase by $50, money supply remains unchanged.

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.

- To increase money supply, Fed buys govt 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 govt 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 often uses discount lending to provide extra liquidity when financial institutions are in trouble, such as after the stock market crash of Oct. 1987.

The Federal Funds Rate

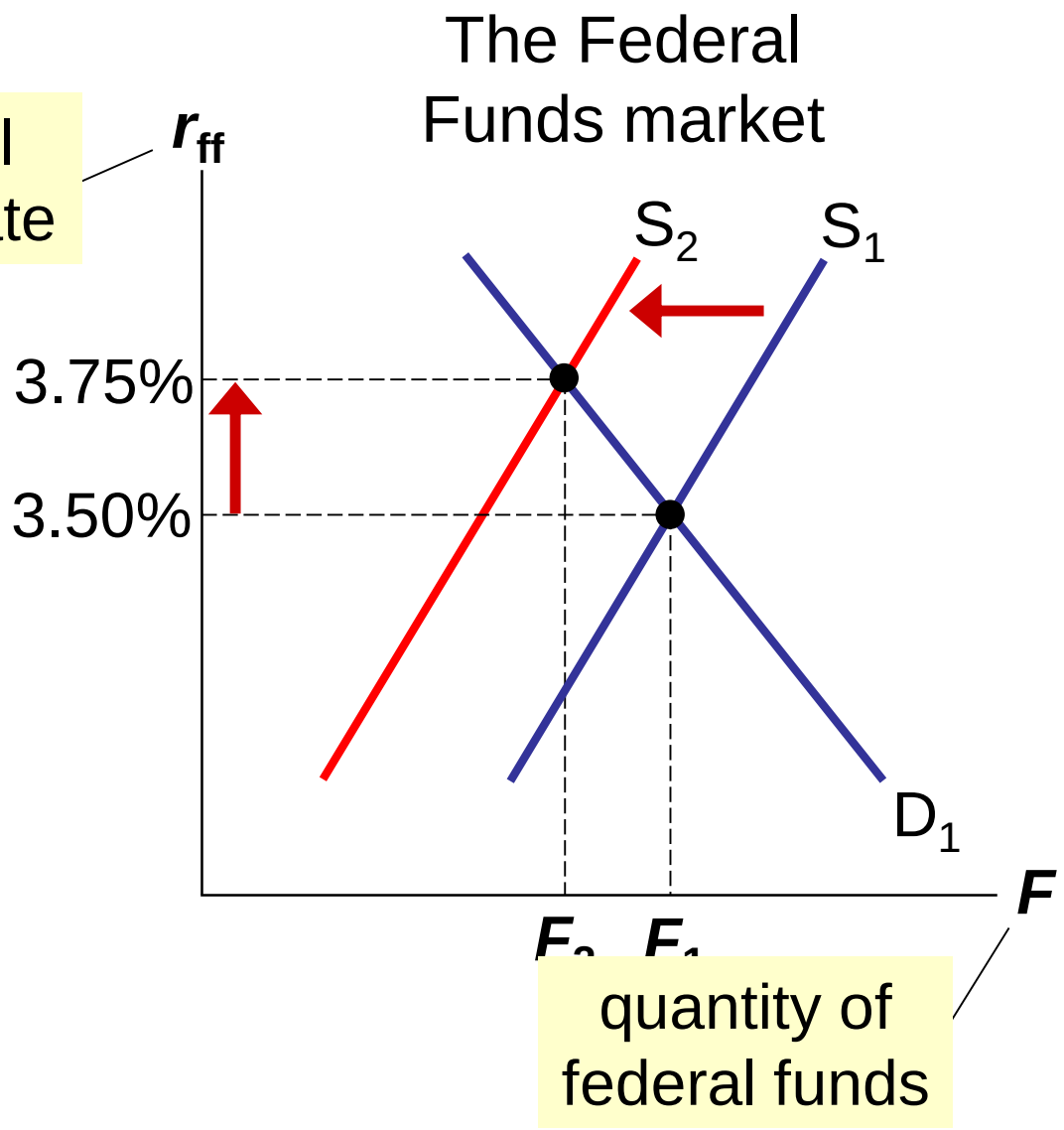
- On any given day, banks with insufficient reserves can borrow from banks with excess reserves.
- The interest rate on these loans is the **federal funds rate**.
- Many interest rates are highly correlated, so changes in the fed funds rate cause changes in other rates and have a big impact in the economy.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

The Federal Funds Rate

To raise fed funds rate, Fed se govt bonds (

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

causes r_{ff} to rise.



Problems Controlling the Money Supply

- If households hold more of their money as currency, banks have fewer reserves, make fewer loans, & money supply falls.
- If banks hold more reserves than required, they make fewer loans, & money supply falls.
- Yet, Fed can compensate for household & bank behavior to retain fairly precise control over the money supply.

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 & hold more reserves to satisfy depositors.
- These events increase ***R***, reverse the process of money creation, cause money supply to fall.

Bank Runs and the Money Supply

- During 1929-1933, a wave of bank runs and bank closings caused money supply to fall 28%.
- Many economists believe this contributed to the severity of the Great Depression.
- Bank runs not a problem today due to federal deposit insurance.

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 Fed controls the money supply mainly through open-market operations. Purchasing govt bonds increases the money supply, selling govt bonds decreases it.
- In a fractional reserve banking system, banks create money when they make loans. Bank reserves have a multiplier effect on the money supply.