

# 29

## The Monetary System

PRINCIPLES OF  

---

ECONOMICS

---

  
FOURTH EDITION

N. GREGORY MANKIW

PowerPoint® Slides  
by Ron Cronovich

# **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.



# 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

$$\text{money multiplier} = 1/\mathbf{R} = 1/0.2 = \mathbf{5}$$

The maximum possible increase in deposits is

$$5 \times \$50 = \$250$$

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.

# 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.