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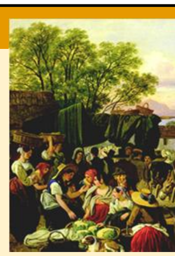
Principles of
Macroeconomics
Sixth Edition



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The Monetary System

Premium 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?

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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**
- Most people would have to spend time searching for others to trade with—a huge waste of resources.
- This searching is unnecessary with **money**,

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The 3 Functions of Money

- **Medium of exchange**:
- **Unit of account**:
- **Store of value**:

The 2 Kinds of Money

Commodity money:

Fiat money:

The Money Supply

- The **money supply** (or **money stock**):
- 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**:

Measures of the U.S. Money Supply

- **M1**:

  M1 = $1.9 trillion (February 2011)

- **M2**:

  M2 = $8.9 trillion (February 2011)

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

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Central Banks & Monetary Policy

- **Central bank**:
- **Monetary policy**:
- **Federal Reserve (Fed)**:

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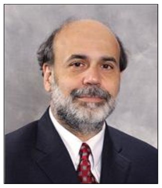
The Structure of the Fed

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.



Ben S. Bernanke
Chair of FOMC,
Feb 2006 – present

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Bank Reserves

- In a **fractional reserve banking system**,
- The Fed establishes **reserve requirements**,
- Banks may hold more than this minimum amount if they choose.
- The **reserve ratio**, ***R***

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Bank T-Account

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

FIRST NATIONAL BANK	
Assets	**Liabilities**

- Banks' liabilities include
  assets include
- In this example, notice

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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

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Banks and the Money Supply: An Example

CASE 1: No banking system

Public holds the $100 as currency.

Money supply =

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	Deposits
Loans	

Money supply
= currency + deposits =

In a 100% reserve banking system,

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	Deposits
Loans	

Depositors have
borrowers have

Money supply =

Banks and the Money Supply: An Example

CASE 3: Fractional reserve banking system

How did the money supply suddenly grow?

When banks make loans,

The borrower gets

- $90 in currency—an asset counted in the money supply
- $90 in new debt—a liability that does not have an offsetting effect on the money supply

A fractional reserve banking system

Banks and the Money Supply: An Example

CASE 3: Fractional reserve banking system

Borrower deposits the $90 at Second National Bank.

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

SECOND NATIONAL BANK			
Assets		**Liabilities**	
Reserves	$ 90	Deposits	$ 90
Loans	$ 0		

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

SNB's borrower deposits the $81 at Third National Bank.

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

THIRD NATIONAL BANK			
Assets		**Liabilities**	
Reserves	$ 81	Deposits	$ 81
Loans	$ 0		

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.

In this example,

Original deposit	=	\$ 100.00
FNB lending	=	\$ 90.00
SNB lending	=	\$ 81.00
TNB lending	=	\$ 72.90
⋮		⋮

Total money supply =

The Money Multiplier

- **Money multiplier**:
- The money multiplier equals
- In our example,
  R = 10%
  money multiplier =
  \$100 of reserves creates

ACTIVE LEARNING 1

Banks and the money supply

While cleaning your apartment, you look under the sofa cushion and 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

A More Realistic Balance Sheet

- Assets: Besides reserves and loans, banks also hold
- Liabilities: Besides deposits, banks also obtain funds from
- **Bank capital**:
- **Leverage**:

A More Realistic Balance Sheet

MORE REALISTIC NATIONAL BANK			
Assets		**Liabilities**	
Reserves	$ 200	Deposits	$ 800
Loans	$ 700		

Leverage ratio:

In this example, the leverage ratio =

Interpretation: for every $20 in assets,
______ is from the bank's owners,
______ is financed with borrowed money.

Leverage Amplifies Profits and Losses

- In our example, suppose bank assets appreciate by 5%, from $1000 to $1050.
- Instead, if bank assets decrease by 5%,
- If bank assets decrease more than 5%, bank capital is negative and bank is insolvent.
- **Capital requirement**:

Leverage and the Financial Crisis

- In the financial crisis of 2008–2009, banks suffered losses on mortgage loans and mortgage-backed securities due to widespread defaults.
- Many banks became insolvent:
  In the U.S., 27 banks failed during 2000–2007, 166 during 2008–2009.
- Many other banks found themselves with too little capital, responded by reducing lending, causing a **credit crunch**.

The Government's Response

- To ease the credit crunch, the Federal Reserve and U.S. Treasury injected hundreds of billions of dollars' worth of capital into the banking system.
- This unusual policy temporarily made U.S. taxpayers part-owners of many banks.
- The policy succeeded in recapitalizing the banking system and helped restore lending to normal levels in 2009.

The Fed's Tools of Monetary Control

- Earlier, we learned
- The Fed can change the money supply by

How the Fed Influences Reserves

- **Open-Market Operations (OMOs)**:
  - If the Fed buys a government bond from a bank, it pays by depositing new reserves in that bank's reserve account.
    With more reserves,
  - To decrease bank reserves and the money supply, the Fed

How the Fed Influences Reserves

- The Fed makes loans to banks, increasing their reserves.
  - Traditional method: adjusting the **discount rate**
  - New method: *Term Auction Facility*
- The more banks borrow, the more reserves they have for funding new loans and increasing the money supply.

How the Fed Influences the Reserve Ratio

- Recall: reserve ratio = reserves/deposits, which inversely affects the money multiplier.
- The Fed sets **reserve requirements**:

  Reducing reserve requirements

- Since 10/2008, the Fed has paid interest on reserves banks keep in accounts at the Fed. Raising this interest rate

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Problems Controlling the Money Supply

- If households
- If banks
- Yet, Fed can compensate for household and bank behavior to retain fairly precise control over the money supply.

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Bank Runs and the Money Supply

- A **run on banks**:
- 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.
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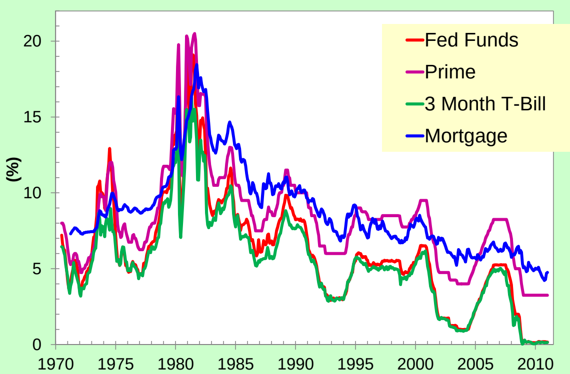
Bank Runs and the Money Supply

- 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.
- Since then,
- In the U.K., though, Northern Rock bank experienced a classic bank run in 2007 and was eventually taken over by the British government.

The Federal Funds Rate

- On any given day, banks with insufficient reserves can borrow from banks with excess reserves.
- the **federal funds rate**
- Changes in the fed funds rate cause changes in other rates and have a big impact on the economy.

The Fed Funds rate and other rates, 1970–2011



Monetary Policy and the Fed Funds Rate

The Federal
Funds market