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
- 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 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 = $1.4 trillion (June 2008)

- **M2:** everything in M1 plus
  
  M2 = $7.7 trillion (June 2008)

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:**

- **Monetary policy:**

- **Federal Reserve (Fed):**

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
**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**, $R$

**Bank T-account**

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

<table>
<thead>
<tr>
<th>FIRST NATIONAL BANK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
</tr>
</tbody>
</table>

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

**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 =

CASE 2: 100% reserve banking system
Public deposits the $100 at First National Bank (FNB).
FNB holds 100% of deposit as reserves:

\[
\begin{array}{c|c|c}
\text{FIRST NATIONAL BANK} & \text{Assets} & \text{Liabilities} \\
\hline
\text{Reserves} & \text{Deposits} \\
\text{Loans} & \\
\hline
\end{array}
\]

Money supply = currency + deposits =

*In a 100% reserve banking system,*

CASE 3: Fractional reserve banking system
Suppose \( R = 10\% \). FNB loans all but 10% of the deposit:

\[
\begin{array}{c|c|c}
\text{FIRST NATIONAL BANK} & \text{Assets} & \text{Liabilities} \\
\hline
\text{Reserves} & \text{Deposits} \\
\text{Loans} & \\
\hline
\end{array}
\]

Money supply = Depositors have Borrowers have
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)

A fractional reserve banking system

CASE 3: Fractional reserve banking system

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

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

<table>
<thead>
<tr>
<th></th>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserves</td>
<td>$ 90</td>
<td>Deposits $ 90</td>
</tr>
<tr>
<td>Loans</td>
<td>$ 0</td>
<td></td>
</tr>
</tbody>
</table>

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

CASE 3: Fractional reserve banking system

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

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

<table>
<thead>
<tr>
<th></th>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserves</td>
<td>$ 81</td>
<td>Deposits $ 81</td>
</tr>
<tr>
<td>Loans</td>
<td>$ 0</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Original deposit</th>
<th>FNB lending</th>
<th>SNB lending</th>
<th>TNB lending</th>
</tr>
</thead>
<tbody>
<tr>
<td>$100.00</td>
<td>$90.00</td>
<td>$81.00</td>
<td>$72.90</td>
</tr>
</tbody>
</table>

In this example, $100 of reserves creates $100.00 in money, $90.00 in deposits, $81.00 in loans, and $72.90 in new deposits.

Total money supply = $729.00

The Money Multiplier

- **Money multiplier:**

- The money multiplier equals

- In our example,
  \[ R = 10\% \]
  money multiplier = $100 of reserves creates $100 of deposits.

ACTIVE LEARNING 1

Banks and the money supply

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?
The Fed’s 3 Tools of Monetary Control

1. **Open-Market Operations (OMOs):**
   - To increase money supply.
   - To reduce money supply.

OMOs are easy to conduct,
The Fed’s 3 Tools of Monetary Control

2. Reserve Requirements (RR):

- To increase money supply.
- To reduce money supply.

3. The Discount Rate:

- When banks are running low on reserves, they may borrow reserves from the Fed.
- To increase money supply.
- To reduce money supply.

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,
The Federal Funds Rate

- On any given day, banks with insufficient reserves can borrow from banks with excess reserves.
- 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 Fed Funds Rate and Other Rates, 1970-2008

Monetary Policy and the Fed Funds Rate

The Federal Funds market
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.

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.

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.