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

- ( ) of exchange: an item buyers give to sellers when they want to purchase g&s
- ( ) of account: the yardstick people use to post prices and record debts
- ( ) 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

( ): 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? Two candidates:
  - **( )**: the paper bills and coins in the hands of the (non-bank) public
  - **( ) 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. 
  \[ M1 = $1.4 \text{ trillion (June 2008)} \]
- **M2**: everything in M1 plus savings deposits, small time deposits, money market mutual funds, and a few minor categories. 
  \[ M2 = $7.7 \text{ trillion (June 2008)} \]

The distinction between M1 and M2 will usually not matter when we talk about “the money supply” in this course.
Central Banks & Monetary Policy

- **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

- **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.
**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 ( ), 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 ( ), \( R \)
  
  \[ R = \frac{\text{total reserves}}{\text{total deposits}} \]

**Bank T-account**

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

  **FIRST NATIONAL BANK**

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserves</td>
<td>$ 10</td>
</tr>
<tr>
<td>Loans</td>
<td>$ 90</td>
</tr>
</tbody>
</table>

- Banks’ liabilities include deposits, assets include loans & reserves.
- In this example, notice that \( R = \frac{10}{100} = 10\% \).
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

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:

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

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

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

---

**CASE 3**: Fractional reserve banking system

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

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

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.*

---

**SECOND NATIONAL BANK**

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserves $9</td>
<td>Deposits $90</td>
</tr>
<tr>
<td>Loans $81</td>
<td></td>
</tr>
</tbody>
</table>

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

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:

<table>
<thead>
<tr>
<th>THIRD NATIONAL BANK</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reserves</td>
<td>$8.10</td>
<td></td>
</tr>
<tr>
<td>Loans</td>
<td>$72.90</td>
<td></td>
</tr>
<tr>
<td><strong>Liabilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deposits</td>
<td>$81.00</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.

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

- ( ): 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
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?
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
\(5 \times 50 = 250\)

But money supply also includes currency, which falls by $50.
Hence, max increase in money supply = $200.

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

Answer: $0

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 does not change.
The Fed’s 3 Tools of Monetary Control

1. ( ) (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 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.
Monetary Policy and the Fed Funds Rate

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

This removes reserves from the banking system, reduces supply of federal funds, causes \( r_f \) to rise.

\[ r_f \]

\[ F \]

\[ S_1 \quad S_2 \]

\[ D_1 \]

\[ 3.75\% \quad 3.50\% \]

THE MONETARY SYSTEM
Problems Controlling the Money Supply

- If households hold more of their money as currency, banks have fewer reserves, make fewer loans, and money supply falls.

- If banks hold more reserves than required, they make fewer loans, and money supply falls.

- 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:
  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.
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, federal deposit insurance has helped prevent bank runs in the U.S.
- In the U.K., though, Northern Rock bank experienced a classic bank run in 2007 and was eventually taken over by the British government.

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.
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.