

Economists use the term “money” in a more specific sense, to refer to the set of assets that people use regularly to buy goods and services from other people.

Functions of Money

- 1) Money is **a medium of exchange**, that is, an item that buyers give to sellers in exchange for goods and services.
- 2) Money is **a unit of account**, that is, the units in which prices are measured.
- 3) Money is **a store of value**, that is, an object that people can use to carry wealth from the present into the future.

Closely associated with the concept of money is that **of liquidity**: the ease with which an asset can be converted into the economy’s medium of exchange.

- By definition, money is the most liquid asset.
- Stocks and bonds are pretty easy to buy and sell. They are highly liquid assets.
- Houses, valuable paintings, and antiques take more time and effort to sell. They are less liquid.

Notice that the first two items on this list highlight a trade-off. **Money is the most liquid asset**, but currency does not pay interest. Bonds are less liquid, but pay interest. This trade-off will become important later on in our analysis of how changes in the money supply affect the economy as a whole.

Kinds of Money

Historically, **gold or gold coins** served as money. This type of money, that takes the form of a commodity with intrinsic value, is called **commodity money**.

US dollar bills have value, but that value is not based on the intrinsic value of the paper and ink themselves. Money without intrinsic value is called **fiat money**, since it is used as money because of government decree.

Money in the US Economy

The money stock is the total quantity of money circulating in the economy.

Suppose we want to measure the money stock for the US. What assets would we include in our measure?

- 1) **Certainly currency**, the paper bills and coins in the hands of the public.
- 2) Probably checks as well. **Demand deposits** are the official name given to bank deposits that customers can access on demand by writing a check.
- 3) Maybe **savings deposits**. Banks won't let customers write checks on savings deposits, but they still can withdraw the funds anytime.
- 4) Maybe also **money market mutual funds**, some of which offer limited check-writing privileges.
- 5) Maybe also **time deposits** (also called **CD's** or **Certificates of deposit**.) Here, the funds can't be withdrawn without penalty for a fixed amount of time, but that amount of time tends to be short – **three to six months** – so these assets, too, are fairly liquid.

Evidently, the choice of what to include is not entirely clear-cut. For this reason, there are several official measures of the US money stock. Two of the most widely used are:

- **M1**. Includes only those assets that are clearly used as a medium of exchange: currency, demand deposits, traveler's checks, and "other checkable deposits" which is the official term for interest-earning checking deposits.
- **M2**. Includes everything in M1, plus other highly liquid assets: **savings deposits**, money market mutual funds, and small (under \$100,000) time deposits.

Figure 1 shows some data on M1 and M2 in 2012. Which measure is bigger? Why?



US Money Supply Measures, December 2012

Note: All figures in billions of dollars.

| | | | |
|-------------------|---------------|------------------|----------------|
| Currency | 1090.9 | TOTAL M1 | 2440.1 |
| Traveler's Checks | 3.8 | Savings Deposits | 6694.5 |
| Demand Deposits | 901.7 | Small CDs | 632.6 |
| OCDs | 443.7 | MMMFs | 635.1 |
| | | | |
| TOTAL M1 | 2440.1 | TOTAL M2 | 10402.4 |

What about credit cards? Credit cards are clearly used to make purchases. Why aren't they included in M1?

The reason is that credit cards are a means for deferring payments as opposed to making payments. At the end of the month, when you pay your credit card bill with a check, you are using the medium of change to finally pay for what you purchased earlier.

But while credit card balances are not included in M1, they clearly influence the level of M1. Before credit cards use became widespread, people had to hold a lot more currency.

Here's one other puzzle.

- In 2009 the stock of US currency in circulation was \$862 billion.
- In 2009, there were 236 million adults in the US.
- $\$862 \text{ billion} / 236 \text{ million people} = \$3,653 \text{ per person!}$
- A lot of this currency is held overseas, as a store of value in countries with unstable political or economic systems.
- Undoubtedly, some of this currency is also held by drug dealers and other criminals.

2. The Federal Reserve System

3. Banks and money supply

Because even the narrowest measure of money, M1, includes both currency and demand deposits, banks play a key role, together with the Fed, in the money supply process. But how exactly do banks participate in this process?

The simple case of 100 Percent Reserve Banking

Start by considering an economy without banks, where all money consists of currency.

Suppose for simplicity that the total quantity of currency in circulation is \$100.

Now suppose that someone opens up bank: call it the First National Bank.

But instead of making loans, all this bank does is to safeguard people's money: it accepts deposits, and keeps the currency in its value until depositor either asks for the currency back or writes a check against his or her balance.

Deposits that the bank receives but does not loan out are called reserves. So this simple form of banking without loans is called 100-percent-reserve banking, for the obvious reason that 100 percent of all deposit held as reserves.

We can use a T-account (a simplified balance sheet), to show what happens if the entire \$100 of currency in circulation is deposited in the bank:

| First National Bank | |
|----------------------------|--------------------|
| Assets | Liabilities |
| Reserves \$100 | Deposits \$100 |

What has happened to the M1 money supply as a result of this transaction?

- Nothing!
- Currency in circulation declines by \$100.
- But demand deposits rise by \$100.

Let's suppose that First National Bank decides on a reserve ratio of 10 percent. Then it holds \$10 (or 10 percent) of its deposits as reserves and lends out the rest. The T-account now becomes

| First National Bank | |
|----------------------------|--------------------|
| Assets | Liabilities |
| Reserves \$10 | Deposits \$100 |
| Loans \$90 | |

What's happened to the money supply as a result of this transaction?

- It has increased!
- Depositors still hold \$100 in demand deposits.
- But now the people who receive the loans hold \$90 in currency.
- The total money supply is \$190

This second example illustrates that in a fractional reserve system, banks can create money.

Notice, however, that while the money supply has gone up because of this transaction, people aren't really wealthier:

- The depositors have \$100 in deposits, just as before.
- The borrowers have \$90 in currency, but now they owe that \$90 to the bank. So that balances out too.

Another way to think about this is that people aren't wealthier, but they are more liquid.

The Money Multiplier

In an economy with a fractional reserve banking system, however, the action does not really stop at the end of this second example.

Now the First National Bank's borrower has \$90 in currency. Presumably, that borrower wanted the funds in order to buy something: consumption good or an investment good.

- Now the money supply is \$343.90.

We could go on and on, repeating this forever. The 3rd National Bank's borrower buys something, the seller deposits the funds in the Forth National Bank, which keeps 10 percent as reserves and lends the rest out.....

But notice in each step, the **additions to the money supply gets smaller and smaller**. So eventually the process will converge. Use a calculator or better yet a computer spreadsheet to do the endless repetitions and what you will find is that when the banking system finally holds the entire \$100 as reserves, the money supply is \$1,000.

In this case, **the money multiplier** – the amount of money that the banking system generates per dollar reserves – is $\$1000 / 100 = 10$.

In this example, where all banks choose a reserve ratio of 10 percent, is it an accident that the money multiplier is 10? No!

In general, if

$$\mathbf{R = the\ reserve\ ratio}$$

then,

$$\mathbf{1/R = the\ money\ multiplier}$$

So if as in our example $R = 0.10$ or 10 percent, then the **money multiplier is $1/R = 1/0.10 = 10$** .

To see why this reciprocal formula must be true, remember that the reserve ratio measures the fraction of deposits that banks hold as reserves:

$$\mathbf{R = Reserves / Deposits}$$

Or

$$\mathbf{Deposits = (1/R) * Reserves}$$

Open Market Operations

Recall that **open market operations** occur when the Fed buys or sells US Government bonds from or to private investors.

When the Fed **buys US Government bonds**, each newly-created dollar held as currency **increases the money supply** by \$1. But each newly-created dollar held as **a deposit increases the money supply** by even more, because of the money multiplier.

And **when the Fed sells US Government bonds**, if the buyer pays for the bond with currency, **the money supply decreases** by \$1. But if the buyer pays for the bond using funds from a bank deposit, the money supply decreases by even more, as the process of multiple deposit creation works in reverse.

Open market operations are easy for the Fed to execute. There is a trading desk at the Federal Reserve Bank of New York that links the Fed to the US Government bond market. The Fed can trade in this market just like all other financial institutions and individual investors.

Open market operations can also be used to change the money supply by large or small amounts.

Because of these advantages, **open market operations are the Fed's most frequently-used policy tool**.

Reserve Requirements

Reserve Requirements are the legally-imposed minimum amount of reserves that banks must hold against their deposits.

We've already seen that a **higher reserve ratio leads to a smaller money multiplier**.

The same reasoning implies that **when the Fed increases reserve requirements, the money supply will fall**.

The Federal funds rate is the interest rate that banks charge each other on very short-term loans of reserves or “federal funds”

5. **The classical theory of inflation**

6. **The cost of inflation**

⇒ **Next lecture topics!**