

# Money

## History of Money

Barter economy: Goods were exchanged directly for other goods, so there was no money in the economy. It was very difficult to have a lot of exchange going on because of the requirement of **double coincidence of wants** inherent to the barter system. In order to have exchange in a barter economy, you need to find someone who has something that you want, and who at the same time wants something that you have. This became very inconvenient with specialization and division of labor. So people started to look for a **“universal equivalent”** (used as “money”), which is a good in terms of which the value of all other goods is measured.

For instance, some societies used cows as “money”

1 cow = 2 goats

1 cow = 5 blankets

1 cow = 3 chairs

1 cow = 50 loafs of bread

etc...

So, a “cow” in this case is the **“universal equivalent”** it plays the role of money.

Some societies used salt as their **“universal equivalent”**, others used tobacco, leather and hides, furs, olive oil, beer or spirits, slaves or wives...huge rocks and landmarks, and cigarette butts.

## Characteristics of Money

1. Non-perishable
2. Divisible

## Evolution of Money

**Barter:** no money is used

**Commodity Money:** The universal equivalent is also a commodity itself such as cows, salt, gold, and silver... So, it is a good that has an intrinsic value and a use value besides its role of universal equivalent or money.

**Goldsmiths:** (early versions of safes) they keep your gold in their vaults and give you a piece of paper that says they owe you a certain amount of gold. Thus the expression “I owe you” IOU.

**Convertible Token Money:** People started to use cheaper metals or pieces of papers that could be exchanged not for their intrinsic value but for the value that is printed on them. So the piece of paper or the metallic coin is not worth much (no intrinsic value), but it's used as “money” because it is **backed by** commodity money (gold or silver) at a fixed exchange rate. Token money is exchanged with the issuer of the currency (goldsmiths). This system is referred to as **the gold standard**.

**Inconvertible Token Money:** it is **not backed by any commodity**, and is not exchanged with the issuer of the currency. Instead it can be converted into commodities at a flexible exchange rate, and not with the issuer but with anybody who happens to have that commodity in the market. This system marks the beginning of Fiat Money.

**Fiat Money:** In 1971, the US went off the gold standard, and the US dollar was no longer convertible into gold. Fiat money exists because of the government's power

**Checks:** a piece of paper that promises to pay a certain amount of **fiat money** that is not backed by any commodity.

**E-money** (different from credit): You use it as a check, so you can only spend up to the level that you have deposited in your bank account (ATM cards).

**Credit cards:** You use it and you promises to pay after a certain time period (at the end of the month hopefully).

These different kinds of money can and do co-exist in our economic system.

## Functions of Money

1. **Unit of account:** money is a means by which a comparable wealth of commodities is measured. Money is a standard or a measure of value.
2. **Medium of exchange:**
  - A/ money is a means of purchase: money is exchanged directly for goods and services.
  - B/ money is a means of payment: Money is used to settle debt (you receive goods and services in advance, and then you settle your debt in the future).
3. **Store of Value:** money is a means of accumulating wealth, it is an end-in-itself.

## Demand for Money

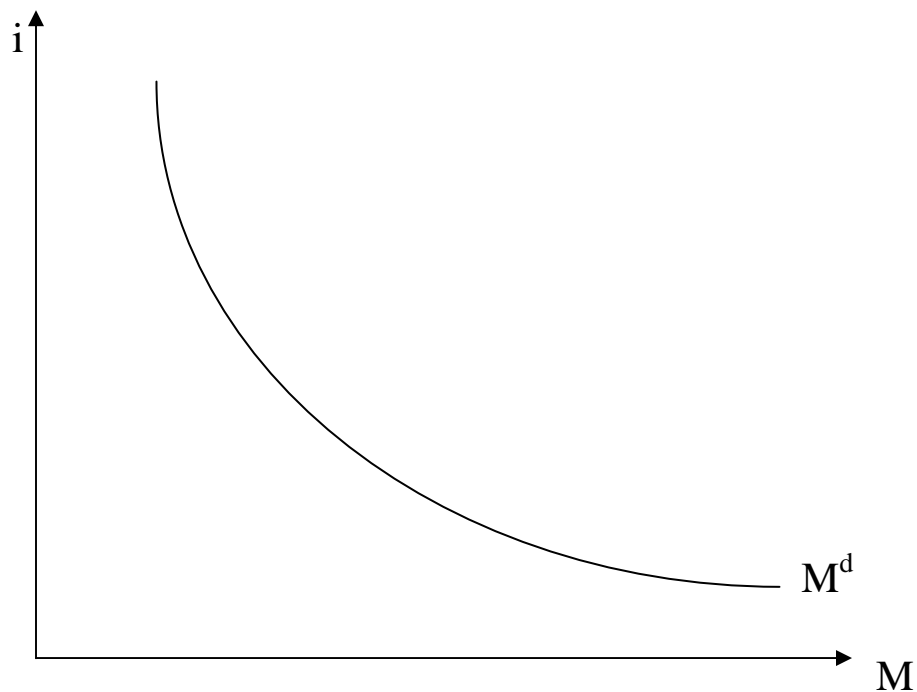
Keynes asked: Why would anyone hold any of their wealth in the form of cash instead of higher interest-earning or profit-bearing assets?

1. Transactions demand – people hold some of their wealth in the form of cash to make regular daily, weekly, monthly transactions (determined by MPC, habits, so it's stable)
2. Precautionary demand – people keep some of their wealth in cash to respond to emergencies, like flat tire or broken arm (determined by tradition; so it's also stable)
3. Speculative demand – people keep some wealth in cash to take advantage of unexpected financial opportunity (make a killing in the stock or bond market). Speculative demand determined by the relation of two rates of interest, the current, actual rate ( $i_c$ ) and the expected future rate ( $i_f$ ). To understand how speculative demand is determined by the relation between  $i_c$  and  $i_f$ , one must understand two things: 1) that investors want to “buy low and sell high”; and 2)

inverse relation between bond prices and interest rates. (Speculative demand is not stable; may be volatile)

When  $i_c < i_f$ , then you think interest rates are going to rise, so you think bond prices are going to fall, so sell bonds and hold cash. (Speculative demand for cash is high).

When  $i_c > i_f$ , then you think interest rates are going to fall, so you think bond prices are going to rise, so buy bonds now and wait to sell them when the price has gone up. (Speculative demand for cash is low).



**Graph 1:** Money demand curve.

$i$  is the real interest rate.

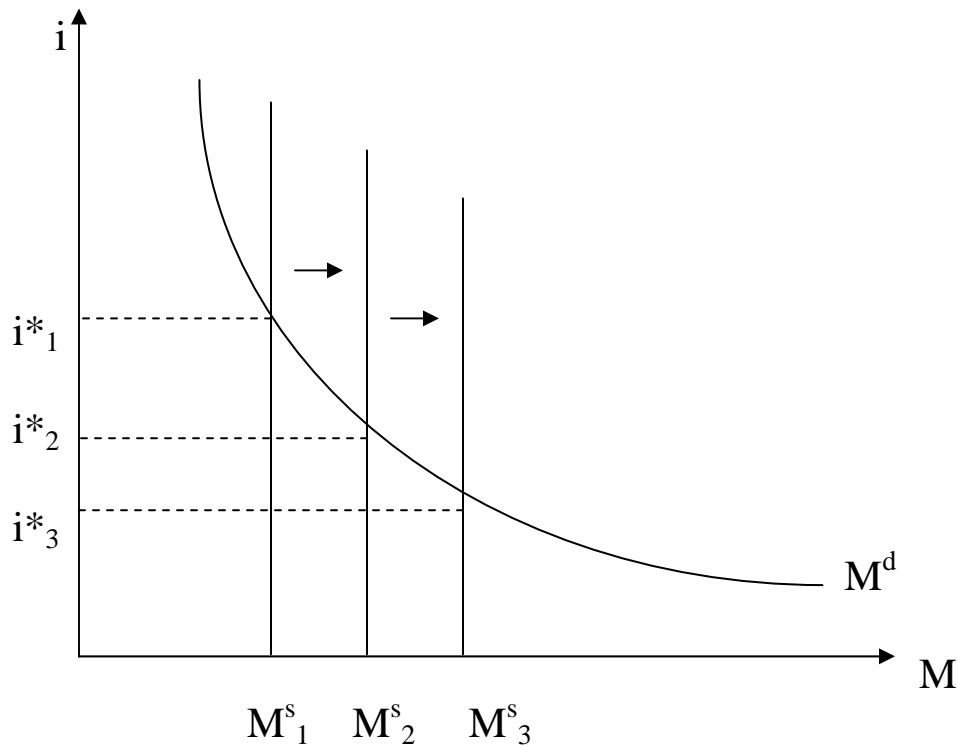
$M$  is the quantity of money

$M^d$  is the demand for money

## Money Supply

There are two different views on the Money Supply: **exogenous** money supply, and **endogenous** money supply.

**Exogenous money supply** means that  $M_s$  is determined **outside** the market system **by the Central Bank** (the Fed), which controls the amount of money supplied to the economy. So, the Fed determines  $M_s$  whereas the market determines the equilibrium interest rate. This means that  $M_s$  is perfectly **inelastic** with regard to the interest rate ( $M_s$  is **vertical**). See graph 2 below.

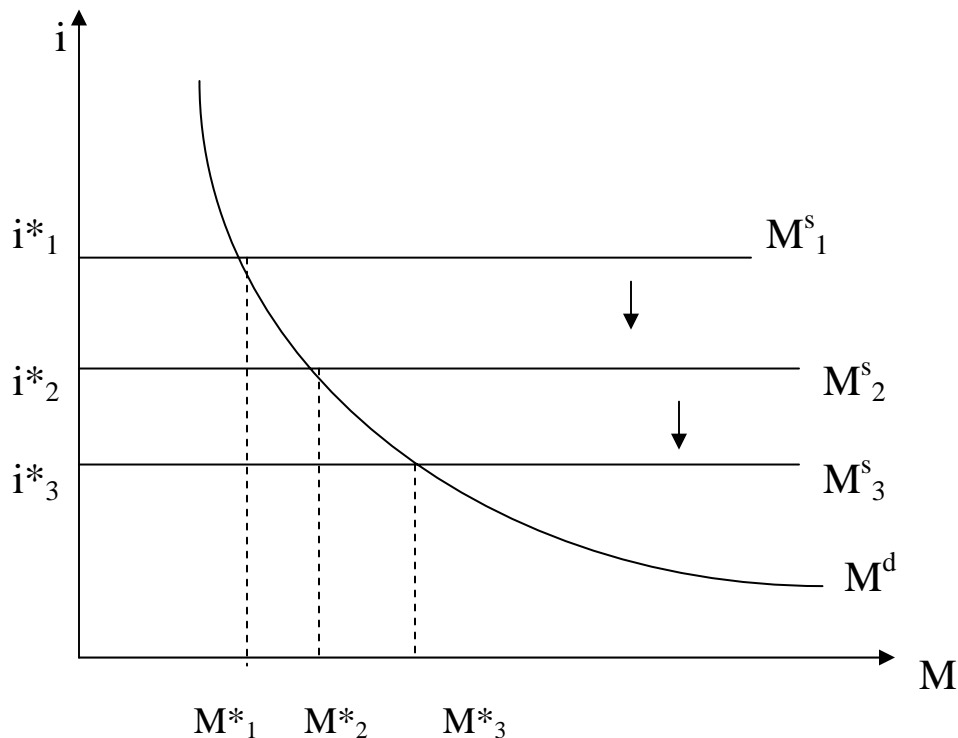


**Graph 2:** Exogenous money supply (determined by the Fed)

**Endogenous money supply** means that  $M_s$  is determined **in** the market system **by market forces not by the Fed**. This means that  $M_s$  is perfectly **elastic** with regard to the interest rate ( $M_s$  is **horizontal**).

The idea here is that the system is driven by the **demand for credit**. So, when there is an increase in the demand for credit by households and firms, both the Fed and private banks will try to **accommodate** this increase in demand for credit, and by doing so, dollar reserves in private banks will be reduced (or depleted). Once credit has been extended, investment increases, which will generate more income and employment, and as a result savings will also increase. Now this increase in savings will be deposited in private banks thus **replenishing** the initially depleted reserves.

So, in this system, the private sector determines the quantity of money to be supplied and the Fed determines the interest rate that banks must pay in order to borrow from the Fed.



**Graph 4:** Endogenous money supply.

## The Banking System

**Central Bank:** in the US it's called the Federal Reserve Bank. The Federal Reserve Bank System has 12 regional Feds, 2 of them are in Missouri (KC and St. Louis). The Fed is neither a private bank nor a government institution (it's kind of both at the same time). It acts as the bank of the Government (Banker for the Treasury). The Fed collects tax payments for the government, and clears checks issued by the government. The Fed also plays the role of regulator for the entire financial system. The Fed is often referred to as the "lender of last resort" because when private banks run out of reserves, they go to the Fed's **discount window**, and borrow money; of course the Fed charges them an interest rate called **the discount rate**.

Private Banks are **required by law** to keep a certain amount of reserves in their vaults. This is what we call the **required reserve ratio (RRR)**, and the Fed determines its level. This is what we call a **fractional reserve banking system**, a system where banks are required to keep only a fraction of the total deposits. So, if the RRR is 10% this means that if a bank has \$1,000 of deposits from its costumers, it is required by law to keep (10% of \$1,000) = \$100 in their vaults in cash. The bank is free to use the other \$900 in any manner it sees fit. So, the \$900 is called **Excess Reserves (ER)**. Thus,

**Total Reserves = Required Reserves + Excess Reserves**

$$TR = RR + ER$$

Generally banks don't want to keep their ER idle in their vaults because ER is just money sitting there not earning any profits. So, what banks do is they lend their ER to customers, businesses, or even other banks that are short on their required reserves. When banks lend their ER they charge the borrower an interest rate, and that's where bank profits come from: **LENDING and charging interest.**

Banks are required by law to show the Fed their reserve accounting every 14 days. So, during the 14-day period private banks can do whatever they want with their reserves, but on the 14<sup>th</sup> day of the accounting period they **MUST** show the Fed that they actually have the 10% required reserve ratio in their vaults. So, if a Bank of America is short on reserves on the 14<sup>th</sup> day, it must find a way to come up with the money. One way to do it is to borrow from another private bank that has some extra reserves (over and above the 10% requirement), say, UMB Bank. This will be a good deal for both. Bank of America will be able to get its required reserves on time, and UMB will be able to make some money off of the deal because they charge Bank of America an interest rate called the **Fed Funds Rate (FFR)** also referred to as the overnight interest rate. **The FFR** is an interest rate that banks charge each other when they borrow in the **Federal Funds Market.**

But what happens if for some reason all banks in the system are short on reserves on the 14<sup>th</sup> day? In this case banks must go to the Fed: the lender of last resort. The Fed cannot let them down! The Fed must **accommodate** the banking system in order to avoid a financial crisis. And that's one of the most important roles that the Fed plays in the economy: making sure that the system functions smoothly.

A **Fractional Reserve Banking (FRB) system** has three important characteristics:

- 1) Banks are private, profit-seeking enterprises – they are in business to earn profits.
- 2) Banks engage in money creation – through processes of **lending, spending, and re-depositing**, banks in a FRB system can affect the supply of money.
- 3) Banks are susceptible to runs – it can and has happened that everyone does come down and demand their money all at the same time, and despite insurance, banks in a FRB system cannot meet such demands.

Notice that there is **tension** between #1 and #3 – because banks are profit-seeking, they want to lend out as much as they can; but because they are susceptible to runs, they don't want to lend out too much

The Fed can control the amount of money supplied in the economy through the following mechanisms:

1. Set reserve requirement ratio (RRR) – proportion of reserves that banks must keep on hand and not lend out. This determines the total lending capacity of the system through determining the proportion of reserves that banks may lend (excess reserves) and the money multiplier (simple money multiplier =  $1/RRR$ ). To increase  $M_s$ , the Fed can lower the RRR; to decrease  $M_s$ , it can raise the RRR.  $M_s$  is extremely sensitive to changes in RRR, because even a small % of a large number is a large number. Very hard to “fine-tune”  $M_s$  using the RRR, so this policy is almost never used for this purpose.
2. Set discount rate (d.r.) – interest rate Fed charges private member banks to borrow reserves – higher d.r. means more expensive to borrow reserves, and banks pass on the higher cost to their customers (charge higher interest rates to borrowers). Lower d.r. means cheaper to borrow reserves from Fed, and banks pass on these lower costs to their customers in the form of lower interest rates on loans. To increase  $M_s$ , lower d.r.; to decrease  $M_s$ , raise d.r. Fed may use this between 2-5 times a year, depending on economic conditions.
3. Open market operations – buying and selling bonds. Key is that money does not count in system when Fed is holding it. To increase  $M_s$ , the Fed can buy bonds; to decrease  $M_s$ , it can sell bonds. This policy is used on a daily basis by Fed (but defensively, to offset market fluctuations)

Private banks usually don't want to go to the Fed's discount window and borrow, because when they borrow from the Fed on a regular basis, the Fed will ask them to show their accounting books, which banks generally don't want to. If a bank goes to the Fed every now and then to borrow money, it means that this bank is not doing very well in the system (it could be that this bank is making bad loans and its costumers are not paying it back...) that's why the Fed looks at their accounting to see how safe is their lending policy. So, banks try to generate funds through other institutional mechanisms through which they can extend their lending capacity beyond the limits imposed by reserve requirements:

1. **Fed funds** – banks borrow from other banks
2. **Foreign banks** lend dollars to U.S. banks (and aren't subject to Fed regulations)
3. **Certificates of Deposits** – offer new attractive CDs or convert present customers who have checking accounts into CDs (CDs have lower reserve requirement ratios)
4. **Repos – repurchasing agreements** – an agreement between a buyer and a seller to reverse a transaction at a specified price at a specified future date (sell million bucks worth of bonds to another bank and agree to buy back for a million ten thousand tomorrow—you get to hold a million bucks overnight, increasing your average reserve holdings over that period)
5. **Open Market Operations (OMO)** – Sell bonds in order to get cash (with or without repurchasing agreements attached)
6. **Fed is the lender of last resort** – borrow reserves from fed (pay discount rate)