

# Money

ECO 301: Money and Banking

# Goals

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- Specific Goals:
  - Learn how quantity of money in the economy is measured.
  - Use supply and demand analysis to determine how changes in money market influence interest rates.
- Learning Objectives:
  - LO2: Understand the role money plays in the interaction with markets for other assets.
  - LO3: Predict changes in interest rates using fundamental economic theories including present value calculations, behavior towards risk, and supply and demand models of money and bond markets.

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# Reading

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- Chapter 2.

# What is money?

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- Money is a commodity or token that is generally acceptable as a means of payment.
- It may or may not have an inherent value.
  - Today the U.S. dollar has no inherent value.
  - In prisons cigarettes are sometimes used as money. Cigarettes have an inherent value.
  - From 1889-1932 and from 1946-1971 the U.S. would redeem dollars for gold. (Gold Standard).
  - Since the late 1970s no country in the world redeems their currency for anything of value.
- Money has three important functions:
  - Medium of exchange
  - Unit of account
  - Store of value.

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# Functions of money

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- Medium of exchange: eliminate the need for a double coincidence of wants.
- Unit of account: an agreed measure for stating the relative prices of goods and services.
  - Necessary in order for consumers to maximize utility.
- Store of value:
  - Money can be held and used for later consumption.
  - Money is not unique in this aspect. Stamps, baseball cards, houses, even computers and TV's can be stores of value.
  - With inflation, the value of money falls. Therefore currencies that undergo hyper-inflation cannot meet this function.

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# Forms of money

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- Two primary forms of money:
  - Currency
  - Deposits at banks and other depository institutions.
  - Stupid trivia:
    - Largest denomination bill the Fed prints is the \$100.
    - Largest denomination ever printed was the \$10,000. Still some in circulation.
    - How many bills do not have presidents on them?

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    - \$10,000 bill has Salmon P. Chase (Secretary of the treasury under Lincoln).

# Official Measures of money

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- Two measures of money called **M1** and **M2**
- M1: currency + checking deposits and traveler's checks.
- These types of assets can be used as immediate means of payment.
- M2: M1 + time deposits, savings deposits, and money market mutual funds.
- The additional items in M2 can *quickly* be converted into a means of payment.
- **Liquidity**: the property of an asset being quickly converted to a means of payment.



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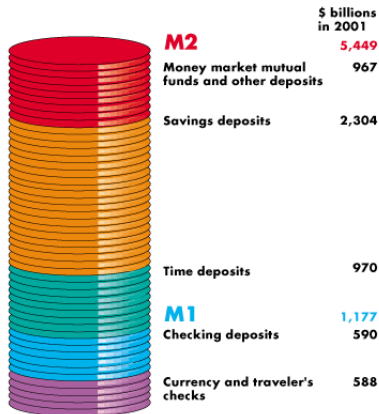
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## Real vs. nominal money

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- **Nominal money:** quantity of money measured in dollars.
- **Real money:** real purchasing power of money.

$$\text{Real money} = \frac{\text{Nominal money}}{\text{Price level}}$$

- What should we use as a price for real money?
- What will be the shape of the money demand curve?

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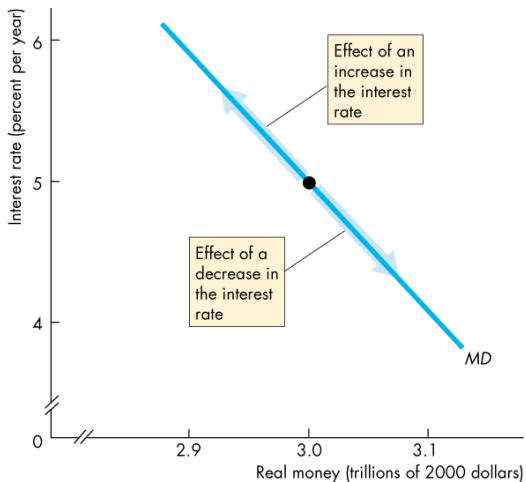
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# Real money demand

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# Influences of money holding

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- The price level: only influences nominal money demand.
- The interest rate. Shift or movement?
- Real GDP.
  - How will an increase in real GDP affect the money demand curve?
- Financial innovation.
  - Examples: ATM's, online banking, automatic transfers between checking and savings accounts, credit and debit cards.
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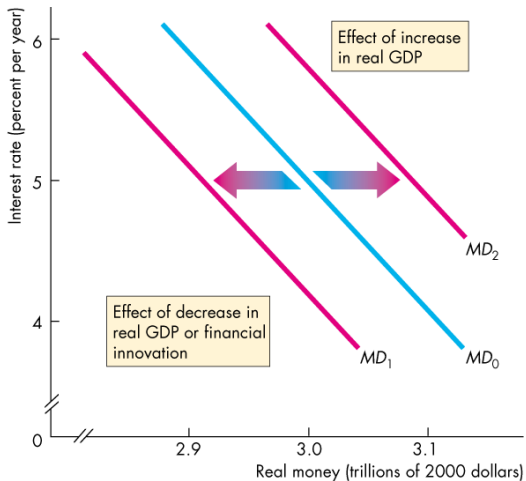
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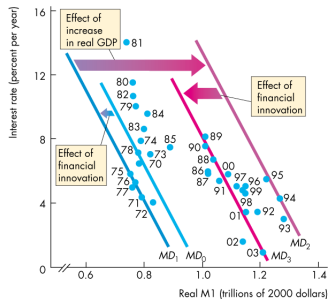
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# Demand for M1 in the U.S.

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- 1 In 1970,  $MD_1$
- 2 Financial innovation in early 70s  $\rightarrow MD_1$
- 3 Late 80s though the 90s increase in real GDP  $\rightarrow MD_2$
- 4 Financial innovations in the 90s and 2000s  $\rightarrow MD_3$



(a) M1 demand

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- Nominal money supply determined?
- What about real money supply?
- In the short run the price level is fixed.
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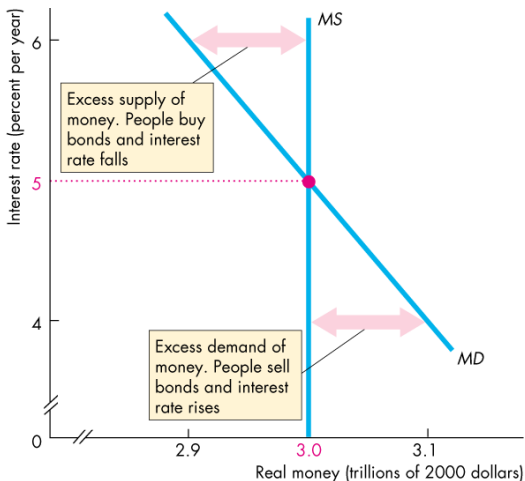
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# Money market equilibrium

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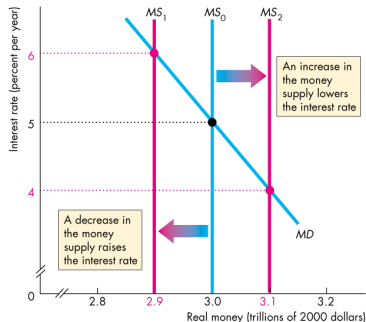




# Monetary policy

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- **Contractionary monetary policy:** decrease in the money supply.
  - Fed conducts an open market \_\_\_\_\_ of bonds.
  - Shifts money supply from  $MS_0$   $\rightarrow$   $MS_1$ .
- **Expansionary monetary policy:** increase in the money supply.
  - Fed conducts an open market \_\_\_\_\_ of bonds.
  - Shifts money supply from  $MS_0$   $\rightarrow$   $MS_2$ .



# Velocity of Money

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- **Velocity of money:** the average number of times a dollar is re-spent in a given year to purchase the total amount of goods and services produced in the economy.
- Equation of exchange: total nominal quantity of money exchanged in the economy should equal the nominal value of aggregate production.

$$MV = PY$$

- $M$ : Total money supply.
- $V$ : Velocity of money.
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- **Velocity of money:** the average number of times a dollar is re-spent in a given year to purchase the total amount of goods and services produced in the economy.
- Equation of exchange: total nominal quantity of money exchanged in the economy should equal the nominal value of aggregate production.

$$MV = PY$$

- $M$ : Total money supply.
- $V$ : Velocity of money.
- $P$ : Price level.
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# Quantity Theory of Money

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- Quantity Theory of Money: classical theory of the relationship between money, prices, and output.
- Assumes velocity of money is constant: determined by institutions and technology that govern how transactions are conducted.
- Assumes wages and prices are perfectly flexible: real GDP is determined by a country's production possibilities.
- If  $V$  is fixed,  $Y$  is fixed, what must happen if money supply doubles?
- Quantity theory of money: increases in money supply lead *only* to an equal percentage increases in prices.

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# Quantity Theory of Money Demand

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- Rearrange equation of exchange:

$$\frac{M_d}{P} = \frac{1}{V} Y$$

- Money demand depends on:
  - $Y$ : real GDP and therefore income.
  - Financial technology.
- What will be the shape of the real money demand function?

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## Quantity Theory and Timing

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- Is this a long-run theory or a short-run theory?
- If  $V$  is determined by technology, financial institutions, laws, etc - these are likely fixed in the *short run*, but not long run.
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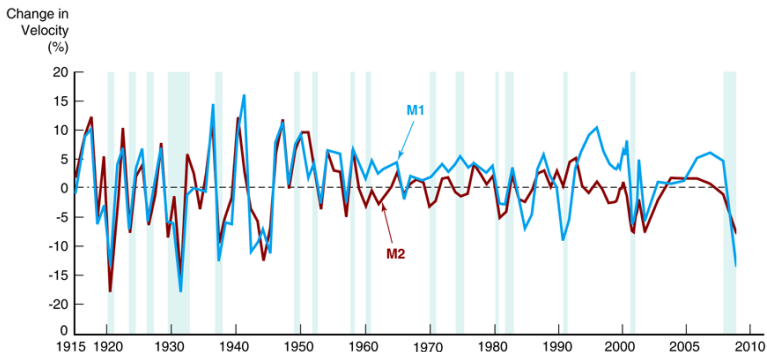
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## Historical Look at Velocity

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- Velocity of money is *not constant* in short run nor long run.
- Velocity of money tends to fall during recessions.

# Quantity Theory and Velocity

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- Demand side determinants of velocity.
  - Expected inflation: if people expect money to lose value, they will try to convert money quickly to either goods or interest bearing assets.
  - Interest rate: this is the opportunity cost of holding money. Larger interest rates will cause people to want to convert money more quickly.
- What will be the shape of the real money demand curve?
- What can shift the money demand curve?



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