Money

ECO 301: Money and Banking

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1.1 Goals

Goals

- 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: Define different measures of money, and analyze a market for money to predict changes in interest rates and the quantity of money in the economy.
    - 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.

1.2 Reading

Reading

- Chapter 2.

2 Money

2.1 What is money?

What is money?

- 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.

2.2 Functions of money

Functions of money

- 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.

2.3 Forms of Money

Forms of money

- 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?
  * $10 has Alexander Hamilton (First secretary of the treasury).
  * $100 bill has Ben Franklin
  * $10,000 bill has Salmon P. Chase (Secretary of the treasury under Lincoln).

Official Measures of money

- 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.

Official Measures of Money

	$ billions in 2001
M2	**5,449**
Money market mutual funds and other deposits	967
Savings deposits	2,304
Time deposits	970
M1	**1,177**
Checking deposits	590
Currency and traveler's checks	588

What is not included in money

- Checks are not money. The balances in the checking accounts are money.

- Credit cards are not money.

  - When you pay with a credit card, you don't give the merchant money, the credit card company does.

  - Then after some time, you give the credit card company money to pay back the loan.

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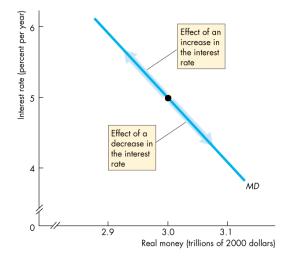# 3 Supply and Demand for Money

3.1 Money Demand

Real vs. nominal money

- **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 is the opportunity cost of holding money?
  Real interest rate.

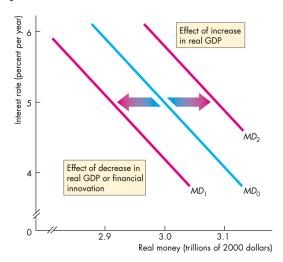- What will be the shape of the money demand curve?

Real money demand

3.2 Influences on Money Demand

Influences of money holding

- 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.
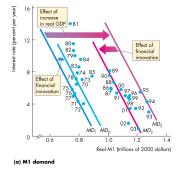- How do these affect the money demand curve?

Shifts in money demand

3.3 U.S. experience

Demand for M1 in the U.S.

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
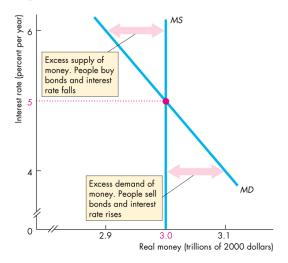
4 Money Market Equilibrium

4.1 Money Supply

Money Supply

- Nominal money supply determined?
  By the Fed.

- What about real money supply?

- In the short run the price level is fixed.

- What is the shape of the money supply curve?
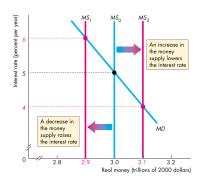
4.2 Interest rate determination

Money market equilibrium

4.3 Monetary policy

Monetary policy

- **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 $MS_0 \rightarrow MS_2$.

5 Quantity Theory

5.1 Velocity of Money

Velocity of Money

- **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.
  - Y: Real GDP.

Quantity Theory of Money

- 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.

5.2 Money Demand

Quantity Theory of Money Demand

- Rearrange equation of exchange:
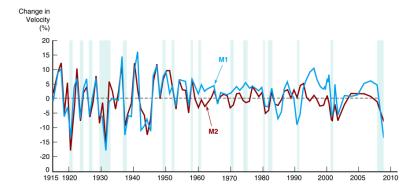
$$\frac{M_d}{P} = \frac{1}{V}Y$$

- Money demand depends on:

    - Y: real GDP and therefore income.
    - Financial technology.

- What will be the shape of the real money demand function?

5.3 Criticisms of Quantity Theory

Quantity Theory and Timing

- 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.

- Y is only determined by production possibilities (technology) is prices, wages, are perfectly flexible - this is likely only true in the *long run*, but not the short run.

Historical Look at Velocity

- Velocity of money is *not constant* in short run nor long run.

- Velocity of money tends to fall during recessions.

Quantity Theory and Velocity

- 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?