Money

ECO 301: Money and Banking

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Goals
Reading

Goals   1/ 24

- 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.

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Goals   1/ 24

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Goals
Reading

Reading   2/ 24

- Chapter 2.

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

What is money?   3/ 24

- 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

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms 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.

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

Functions of money

4/ 24

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

Hyperinflation in Zimbabwe

- The inflation rate in Zimbabwe reached a high November 2008 at 89,700,000,000,000,000,000,000%
- Prices doubled *every day*
- In 2007, a loaf of bread cost 5 ZWD
- Nine months later loaf of bread cost 50 billion ZWD
- In 2015, 35 quadrillion ZWD (35,000,000,000,000 ZWD) traded for 1.00 USD

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

Hyperinflation in Venezuela   6/ 24

- The inflation rate in Venezuela in June 2018 was 46,000%

- Prices doubled every 41 days

- Hyperinflation problems continue to this day

- Country in an economic and financial crisis since 2012

- President Nicolas Maduro introduced new 100,000 Bolívar note in November 2017 (Worth ≈ 0.4 USD - Sept 2018)

- Sept 2018 exchange rate: 1 USD ≈ 250,000 VES

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

Forms of money   7/ 24

- 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?

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

Forms of money   7/ 24

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

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.

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

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8/ 24

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

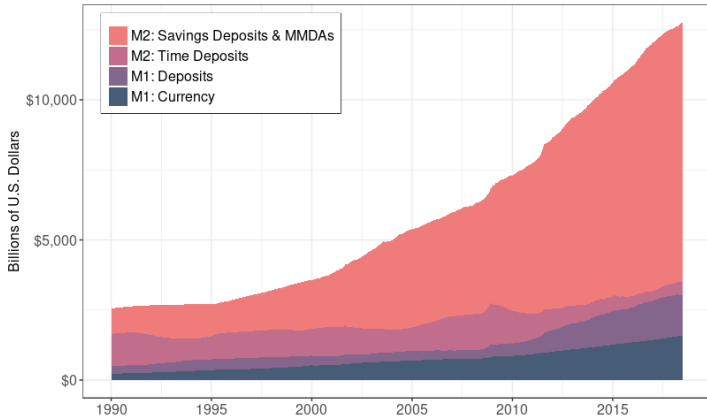Official Measures of money   8/ 24

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

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Source: Federal Reserve Economic Database, Retrieved 2018/09/09

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

What is not included in money   10/ 24

- 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.

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

What is money?
Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Functions of money
Forms of Money

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Demand
Influences on Money Demand
U.S. experience

Real vs. nominal money   11/ 24

- **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?

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Demand
Influences on Money Demand
U.S. experience

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Demand
Influences on Money Demand
U.S. experience

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Demand
Influences on Money Demand
U.S. experience

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Demand
Influences on Money Demand
U.S. experience

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Demand
Influences on Money Demand
U.S. experience

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Demand
Influences on Money Demand
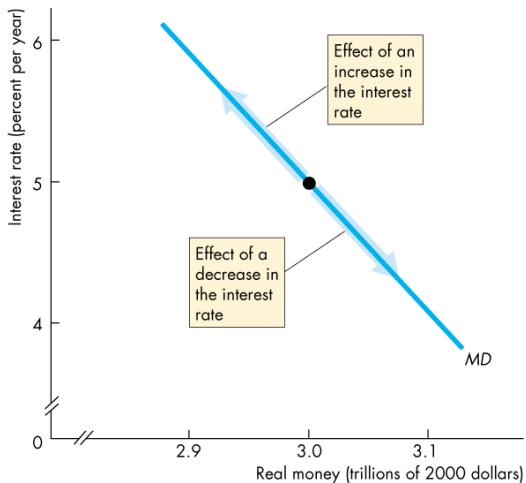U.S. experience

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Demand
Influences on Money Demand
U.S. experience

Real money demand

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Demand
Influences on Money Demand
U.S. experience

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?

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Demand
Influences on Money Demand
U.S. experience

Influences of money holding

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Money Market Equilibrium
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Money Market Equilibrium
Quantity Theory

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Influences on Money Demand
U.S. experience

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Influences on Money Demand
U.S. experience

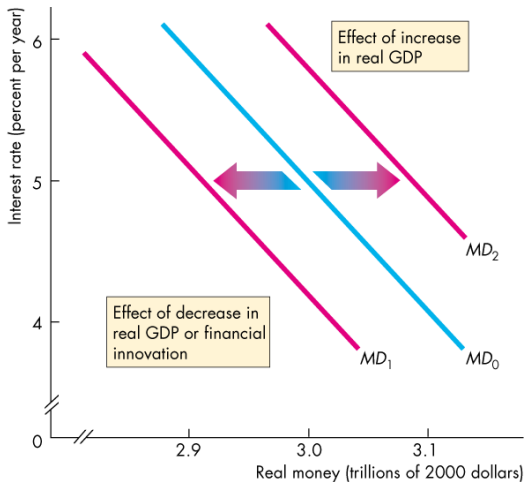## Influences of money holding   13/ 24

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Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Demand
Influences on Money Demand
U.S. experience

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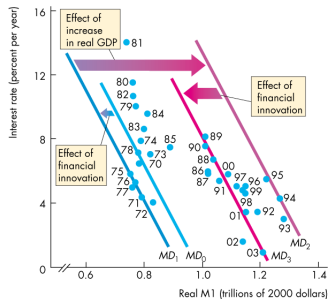   - How do these affect the money demand curve?

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Demand
Influences on Money Demand
U.S. experience

Shifts in money demand

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Demand
Influences on Money Demand
U.S. experience

Demand for M1 in the U.S.   15/ 24

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

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Money Supply
Interest rate determination
Monetary policy

Money Supply   16/ 24

- Nominal money supply determined?

- What about real money supply?
- In the short run the price level is fixed.
- What is the shape of the money supply curve?

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

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Money Market Equilibrium
Quantity Theory

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Money Market Equilibrium
Quantity Theory

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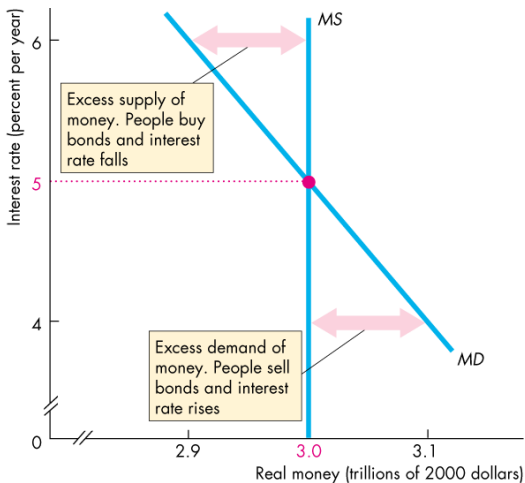- What is the shape of the money supply curve?

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Quantity Theory

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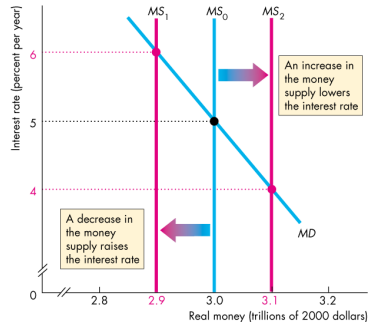**Money Market Equilibrium**
Quantity Theory

Money Supply
Interest rate determination
Monetary policy

Money market equilibrium

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Monetary policy

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

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Velocity of Money
Money Demand
Criticisms of Quantity Theory

Velocity of Money   19/ 24

- **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.

$$M_b V = PY$$

  - M_b: Monetary base
  - V: Velocity of money
  - P: Price level
  - Y: Real GDP

Money
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Money Market Equilibrium
Quantity Theory

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Money Demand
Criticisms of Quantity Theory

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Money Market Equilibrium
Quantity Theory

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Money Demand
Criticisms of Quantity Theory

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Money Market Equilibrium
Quantity Theory

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Criticisms of Quantity Theory

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Money Market Equilibrium
Quantity Theory

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Money Demand
Criticisms of Quantity Theory

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Money Market Equilibrium
Quantity Theory

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Criticisms of Quantity Theory

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Money Market Equilibrium
Quantity Theory

Velocity of Money
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Criticisms of Quantity Theory

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Velocity of Money
Money Demand
Criticisms of Quantity Theory

Quantity Theory of Money   20/ 24

- Quantity Theory of Money: classical theory of the relationship between money, prices, and output

- Assumes velocity of money is fixed: determined by institutions and technology that govern how transactions are conducted

- Assumes wages and prices are perfectly flexible: real GDP is fixed, determined by production possibilities

- If V is fixed, Y is fixed, what must happen if money base doubles?

- Quantity theory of money: increases in money supply lead *only* to an equal percentage increases in prices.

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Money Market Equilibrium
Quantity Theory

Velocity of Money
Money Demand
Criticisms of Quantity Theory

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Money Market Equilibrium
Quantity Theory

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Money Demand
Criticisms of Quantity Theory

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Money Market Equilibrium
Quantity Theory

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Money Demand
Criticisms of Quantity Theory

Quantity Theory of Money Demand   21/ 24

- Rearrange equation of exchange:

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

- Money demand depends on:
    - Y: real GDP (aka income)
    - Financial technology

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

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Velocity of Money
Money Demand
Criticisms of Quantity Theory

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Money Market Equilibrium
Quantity Theory

Velocity of Money
Money Demand
Criticisms of Quantity Theory

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Quantity Theory

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Criticisms of Quantity Theory

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Money Market Equilibrium
Quantity Theory

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Criticisms of Quantity Theory

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Money Market Equilibrium
Quantity Theory

Velocity of Money
Money Demand
Criticisms of Quantity Theory

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Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Velocity of Money
Money Demand
Criticisms of Quantity Theory

Quantity Theory and Timing   22/ 24

- 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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Money Market Equilibrium
Quantity Theory

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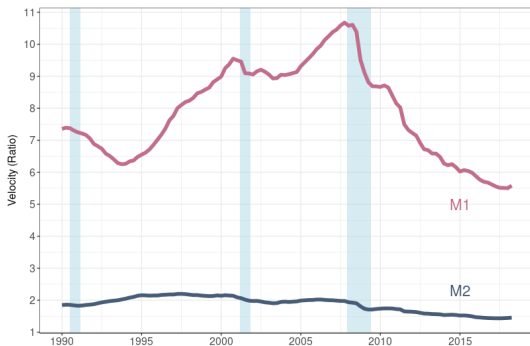Criticisms of Quantity Theory

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Money Market Equilibrium
Quantity Theory

Velocity of Money
Money Demand
Criticisms of Quantity Theory

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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Velocity of Money
Money Demand
Criticisms of Quantity Theory

Historical Look at Velocity

- Velocity is *not constant* in short run nor long run.
- Velocity tends to fall during recessions.
- Velocity tends to move in same direction as interest rates.

Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Velocity of Money
Money Demand
Criticisms of Quantity Theory

Quantity Theory and Velocity   24/ 24

- 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?
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Money
Supply and Demand for Money
Money Market Equilibrium
Quantity Theory

Velocity of Money
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Money Market Equilibrium
Quantity Theory

Velocity of Money
Money Demand
Criticisms of Quantity Theory

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Money Market Equilibrium
Quantity Theory

Velocity of Money
Money Demand
Criticisms of Quantity Theory

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Money Market Equilibrium
Quantity Theory

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Money Demand
Criticisms of Quantity Theory

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