# LECTURE VII

28 February 2012

# TOPIC 8

## MONEY

# BIG PICTURE

- What is money?
- What determines the supply of money? The demand?
- How does the Federal Reserve control the money supply and what role do banks play?
- How does money impact the larger economy?

# WHAT IS MONEY?

- What about money makes it money?

  1. Medium of Exchange - useful in making exchanges between sellers and buyers

  2. Unit of Account - a measure of pricing and recording debt

  3. Store of Value - item that can transfer ability to buy from present to future

- Which of the following are money: currency, checks, cigarettes, shells, credit cards

# BREAKING MONEY

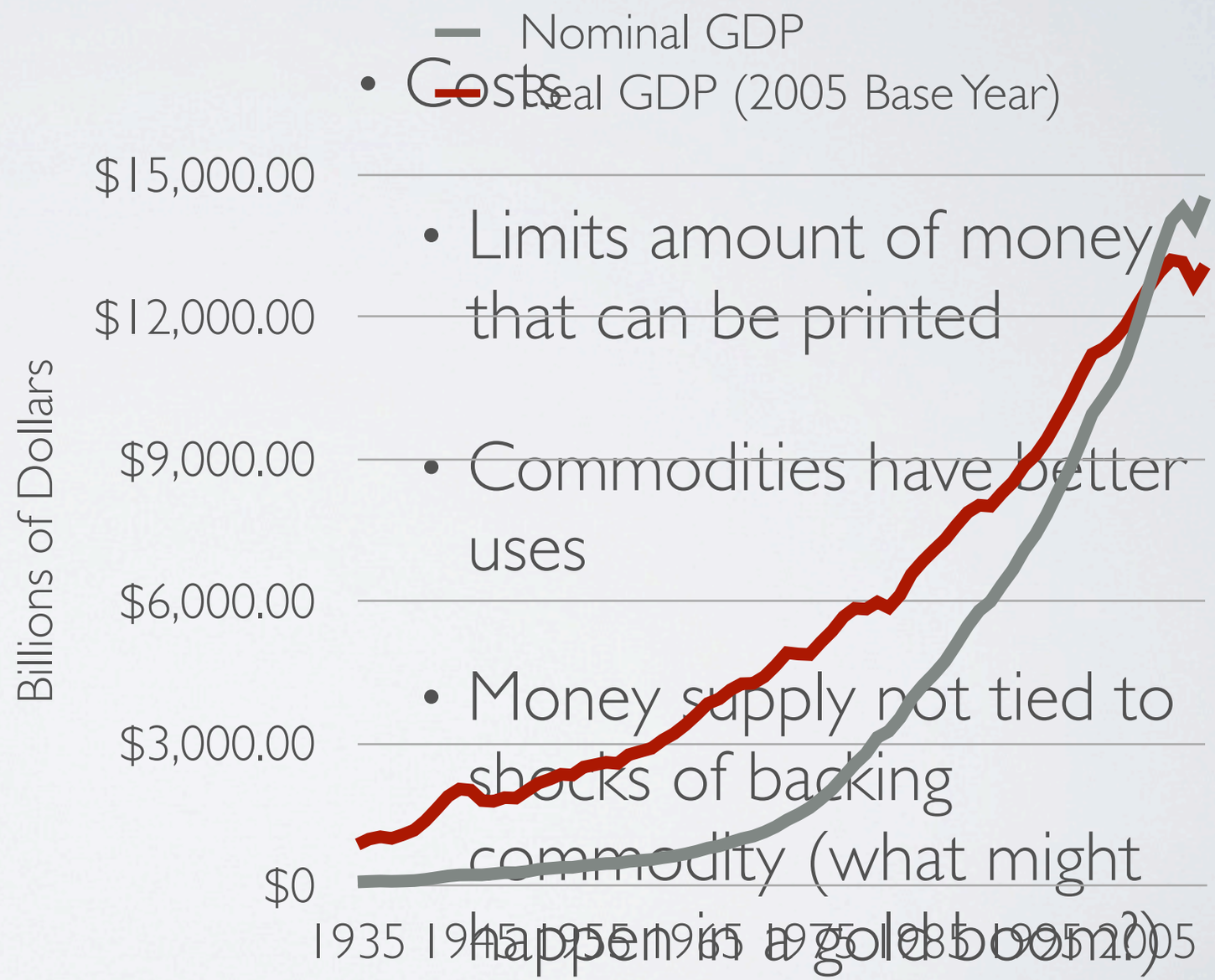
- Money is not just money, but includes several categories
  - **M1**: Currency (token money inherently worth less its actual value) and Fed notes; checkable deposits
  - **M2**: M1 + savings deposits, time deposits, mutual funds, etc.
- Difference is **liquidity**
  - Liquidity - ease with which an asset can be converted into the economy's medium of exchange
  - What assets have low liquidity?

# COMMODITY AND FIAT MONEY

- **Commodity money:** money with intrinsic value
- **Fiat money:** money with value because the government claims it does
- US money is fiat money and has no real backing, but is essentially a debt owed to you by the Federal Reserve
  - Before 1975, money was backed by a gold standard
  - Which is better?

# COMMODITY VERSUS FIAT

- Benefits:
  - Money has real value
  - Price Stability
- Costs
  - Limits amount of money that can be printed
  - Commodities have better uses
  - Money supply not tied to shocks of backing commodity (what might happen in a gold boom?)



# MONEY IN CIRCULATION

- Recall currency is the paper stuff
- In 2007, there was $759,000,000,000 in circulation or $3,272 per adult. Do you hold that much? Where did it go?
  - Currency might be used overseas in black markets
  - Money by foreign countries with traditionally unstable economies
  - **Seigniorage** - profits when dollars stay overseas (If it costs 4 cents to make a dollar, and we sold it for $1 of products, the return is 96 cents)

# MONEY DEMAND

- Why do we hold or want money?

  1. Use it (for real goods)

  2. Store assets, i.e. checking accounts

- Demand for (1) is a function of how much you want to consume

- Demand for (2) ?

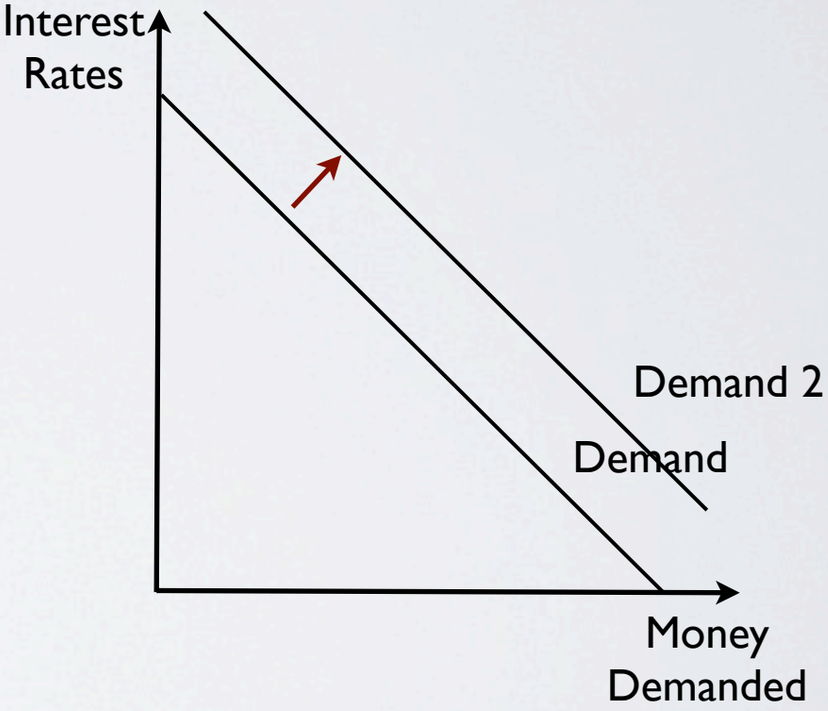
# DEMAND FOR ASSETS

- Unlike before, now $1000 can go into a checking account or bonds, for example
- Suppose the interest rate on the checking account is 0%
  - What is the opportunity cost of depositing in the checking if interest rates on bonds is 2%?
  - 10%?
- Cost increases with interest rates

# MONEY DEMAND

- So we can derive demand as a function of interest rates

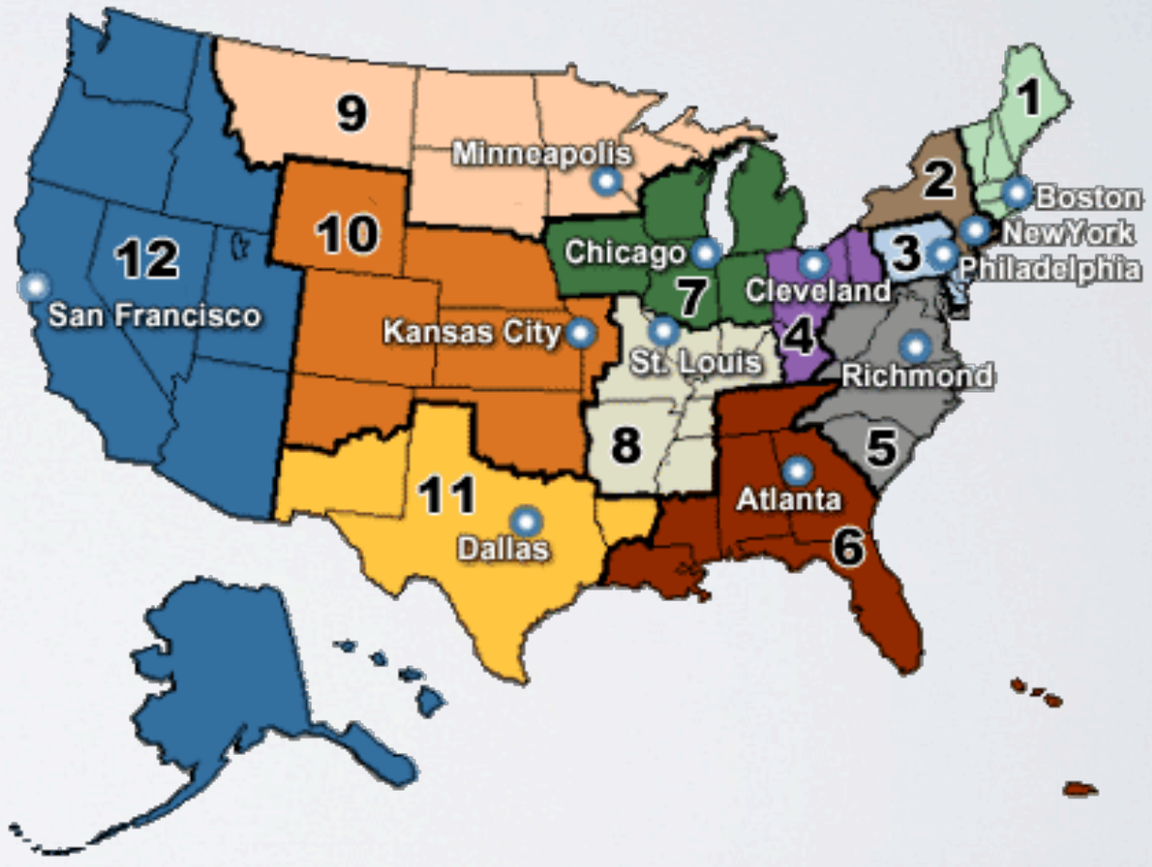
- What happens if desired consumption increases?



# THE MONEY SUPPLY

- Money in the States is *fiat currency* and so is regulated by the government (a central bank)

- The Federal Reserve Bank is the regulator in the States and manages printing money



# THE FEDERAL RESERVE

- The Federal Reserve is partially independent, partially public
  - All chartered banks must buy Fed stock
  - The Board of Governors is picked by political leaders
  - The Fed is charged to stabilize the economy, not make a profit
  - The Fed only makes loans and takes deposits from banks not citizens
- **Independence** - the Fed has Congressional guidelines but operates independently. Why is this important? Is it?

# THE FED AND THE MONEY SUPPLY

- How does the Fed manage the money supply?
  - Supervises banks: lends money
  - Controlling the money supply
    - Printing currency (A1 = Boston, B2 = NY, C3 = Philadelphia, D4 = Cleveland, E5 = Richmond, F6 = Atlanta, G7 = Chicago, H8 = St. Louis, I9 = Minneapolis, J10 = Kansas City, K11 = Dallas, L12 = San Francisco) - Check your dollars!
    - Set reserve requirements
    - Conduct Open Market Operations
- Key point is that it requires operating with **private banks**

# BANKS AND THE MONEY SUPPLY

# BANK OPERATION

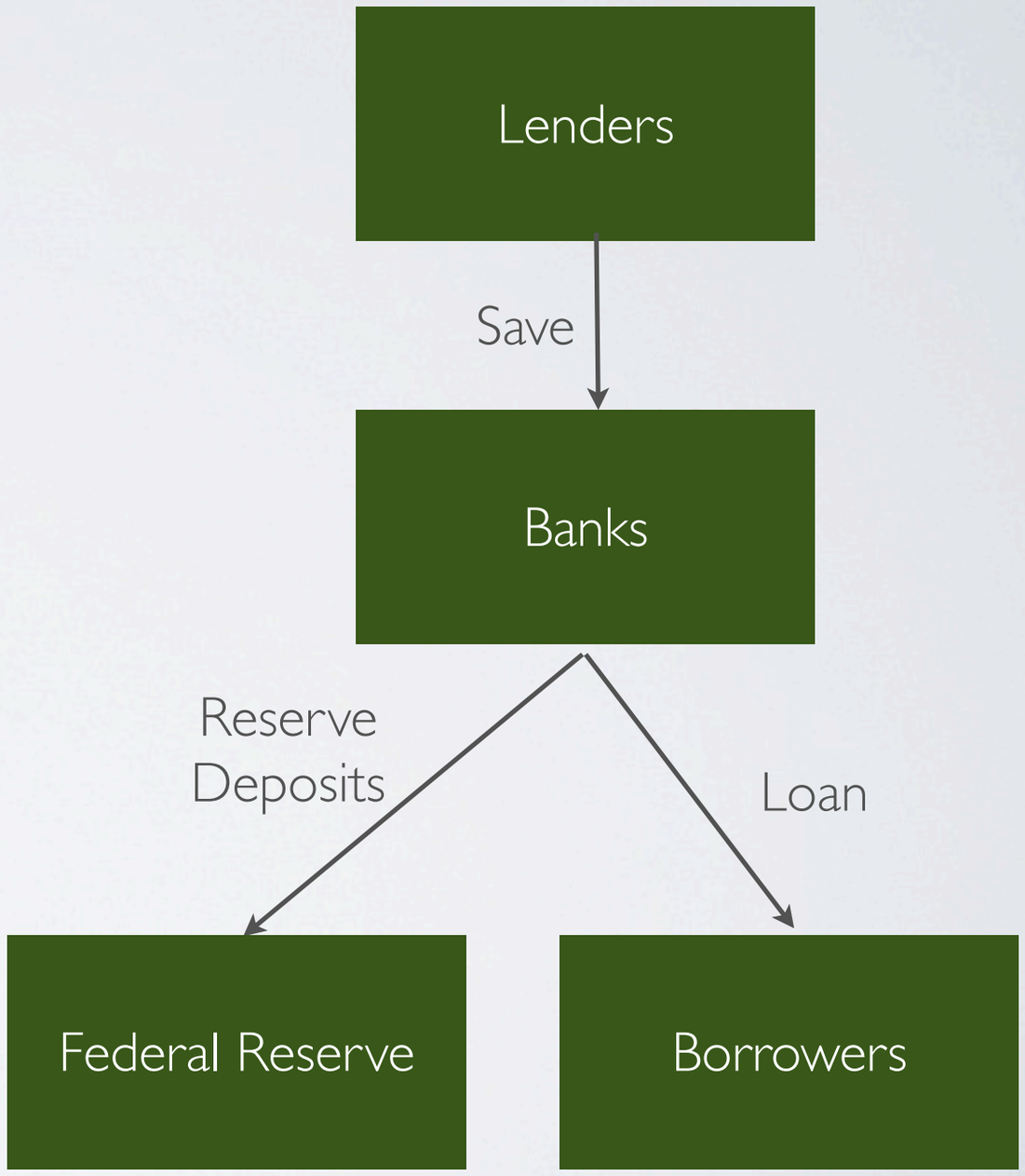
- Fed can expand money supply through currency but also through bank policy
- What motivates banks?
- We assume **profit-maximization**, which requires making a lot of loans to earn interest
- Money from depositors almost immediately turned around for loans, with some regulations

# RESERVE BANKING

- One regulation on banks is the **reserve requirement or ratio** set by the Fed

- RR - minimum percentage of checkable deposits the bank must keep on deposit at the Fed or in its own vault

- Excess reserves: quantity held beyond what is required



# RR EXAMPLE

- Deposit $1000 in TCF. How much can be lent out if RR = 0?
  - Up to $1000, since there are no requirements
- Deposit $1000 in TCF. Let the RR = 1
  - No money can be loaned out
- Deposit $1000 in TCF. Let RR = .5
  - TCF can must keep 50% of the deposits, or .5*1000 = $500 so can lend $500

# RESERVE BANKING

- So ... how do you get your money back from the bank? What if all the loans fail?
  - In the Great Depression, people did not get their money. It was gone forever in a "bank run"
  - Now **FDIC Insurance** covers savings up to $250,000 so TCF can go bankrupt and you can still get up to that amount
- No bank, even the best, holds enough money to pay everyone at the same time so why increase risk by letting banks lend?

# BANK LENDING

- RR<1 because bank lending has use to the economy
- Consider how banks lend out money:
  - Banks have assets - money, promises on loans from borrowers, etc.
  - Banks also have liabilities - deposits (they owe the money to the people saving)
  - Deposits **MUST EQUAL** assets

# BANK LENDING, AN EXAMPLE

- Suppose RR = .20 and Steve invents a great product, makes a $1000, and deposits it in Bank of America

| Assets | Liabilities |
| --- | --- |
| $200 Reserve | $1000 Deposit by Steve |
| $800 Excess Reserve | |

- The bank must keep $200 in reserves

# BANK LENDING, AN EXAMPLE

- Now, the bank can lend out $800. Suppose Bill needs a computer and takes out a $800 loan from BoA and pays Eric

| Assets | Liabilities |
|---|---|
| $200 Reserve | $1000 Deposit by Steve |
| $800 Loan to Bill | |

- The $800 are still an asset, but now as a loan that will be paid back

# BANK LENDING, AN EXAMPLE

- Eric is now going to deposit his $800 money into BoA

| Assets | Liabilities |
|---|---|
| $200 Reserve from Steve + $160 from Eric | $1000 Deposit by Steve |
| $800 Loan to Bill | $800 Deposit by Eric |
| $640 Excess Reserve | |

- The bank has to hold 20% of his loan, or $160, and has the rest in excess reserves

# BANK LENDING, AN EXAMPLE

- Jill needs friends and takes out $640 loan to pay to Mark, who can help find her friends. Mark deposits his money in the bank

| Assets | Liabilities |
|---|---|
| $200 Reserve from Steve + $160 from Eric + $128 from Mark | $1000 Deposit by Steve |
| $800 Loan to Bill | $800 Deposit by Eric |
| $640 Loan to Jill | $640 from Mark |
| $512 Excess Reserve | |

- The bank must keep 20% of $640 in reserves, or $128 and can keep the rest as excess

# BANK LENDING, AN EXAMPLE

- How did the money expand from the beginning of the example?

| Assets | Liabilities |
|---|---|
| $200 Reserve from Steve + $160 from Eric + $128 from Mark | $1000 Deposit by Steve |
| $800 Loan to Bill | $800 Deposit by Eric |
| $640 Loan to Jill | $640 from Mark |
| $512 Excess Reserve | |

- Started with $1000, and now M1 = $2440

# THE MONEY MULTIPLIER

- Could the Fed do anything to increase how much the money supply increase through loans?

- Change the RR, specifically the lower the reserve the more money banks can loan, and so the more M1 can expand

- **Money multiplier** = 1 / RR - indicates how much we can expand money by

  - Example: 1/.2 = 5 so could have expanded money 5x

  - Maximum supply = Initial * MM = $1000*5 = $5000 or create $5000 - $1000 = $4000

# THE MONEY MULTIPLIER

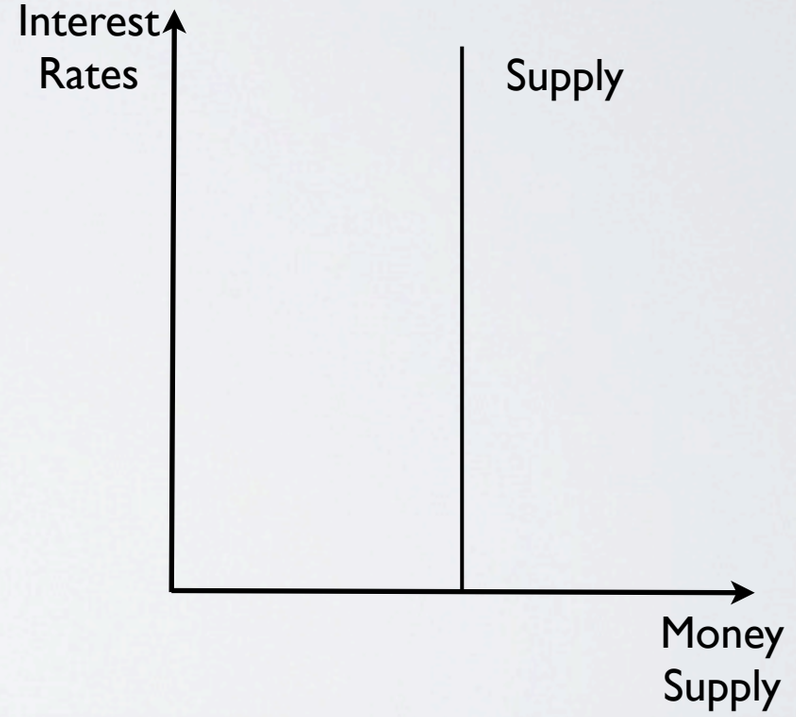
- Suppose the RR is cut in half so RR = . 1
  - Maximum Money supply :
    - $1000 * 10 =$10000 (twice as much)
- Maximum Creation :
  - $10000 - $1000 = $9000 (more than twice of $4000)

# EQUILIBRIUM IN THE MONEY MARKET

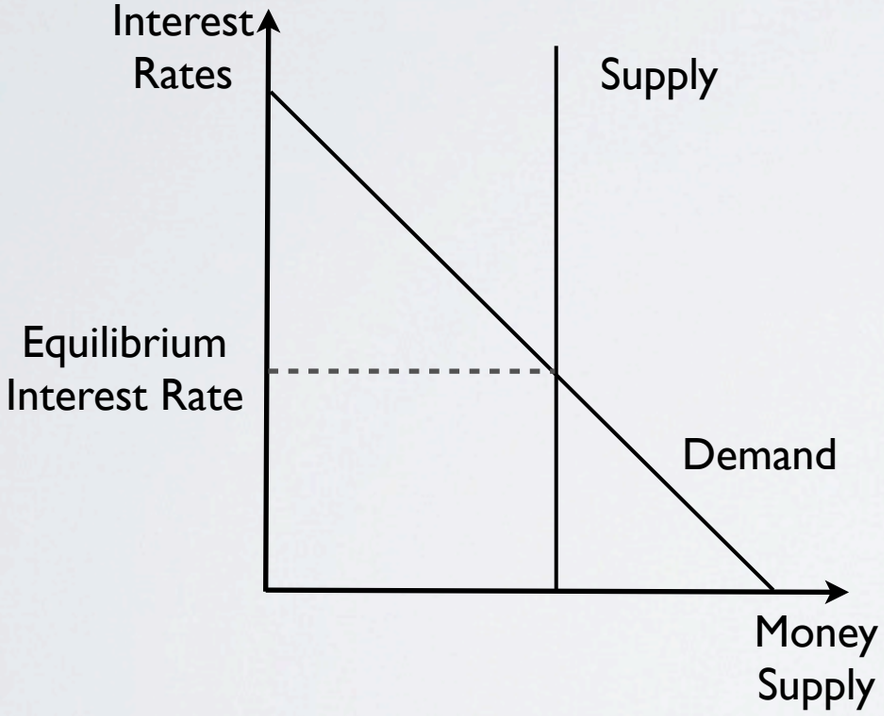
# MONEY SUPPLY

- What is the relationship of the money supply to interest rates (recall we derived demand as a function of interest rates?)

- Inelastic. Money is money regardless of interest rates



# EQUILIBRIUM




- There is some price such that the amount of money demanded is exactly the amount supplied
- This is the interest rate that clears the money market