

# Unit 4: Money and Monetary Policy



# Money!!!

## Who is on the...

- |                    |              |
|--------------------|--------------|
| 1. \$100 Bill      | 1. Franklin  |
| 2. \$50 Bill       | 2. Grant     |
| 3. \$20 Bill       | 3. Jackson   |
| 4. \$10 Bill       | 4. Hamilton  |
| 5. \$5 Bill        | 5. Lincoln   |
| 6. \$2 Bill        | 6. Jefferson |
| 7. 50 Cent         | 7. JFK       |
| 8. Dime            | 8. FDR       |
| 9. \$1000 Bill     | 9. Cleveland |
| 10. \$100,000 Bill | 10. Wilson   |



## Bonus:

“E Pluribus Unum”  
means....

“Out of Many, One”

# Why do we use money?

**What would happen if we didn't have money?**

**The Barter System: goods and services are traded directly. There is no money exchanged.**

**Problems:**

- 1. Before trade could occur, each trader had to have something the other wanted. This is called the “Double Coincidence of Wants”**
- 2. Some goods cannot be split. If 1 goat is worth five chickens, how do you exchange if you only want 1 chicken?**

**Example: A heart surgeon might accept only certain goods but not others...he doesn't like broccoli...**

**To get the surgery, a pineapple grower must find a broccoli farmer that likes pineapples.**

# What is Money?

**Money is anything that is generally accepted in payment for goods and services**

**Money is NOT the same as wealth or income**

**Wealth is the total collection of assets that store value**

**Income is a flow of earnings per unit of time**

**Commodity Money- Something that performs the function of money and has alternative uses.**

**– Examples: Gold, silver, cigarettes, etc.**

**Fiat Money- Something that serves as money but has no other important uses.**

**– Examples: Paper Money, Coins, Digital Currency**

# 3 Functions of Money

## 1. A Medium of Exchange

- Money can easily be used to buy goods and services with no complications of barter system.

## 2. A Unit of Account

- Money measures the value of all goods and services. Money acts as a measurement of value.

- 1 goat = \$50 = 5 chickens OR 1 chicken = \$10

## 3. A Store of Value

- Money allows you to store purchasing power for the future.
- Money doesn't die or spoil.

# What backs the money supply?

There is no gold standard. Money is just an I.O.U. from the government “for all debts, public and private.”

## What makes money effective?

1. Generally Accepted - Buyers and sellers have confidence that it IS legal tender.
2. Scarce - Money must not be easily reproduced.
3. Portable and Divisible - Money must be easily transported and divided.

The **Purchasing Power** of money is the amount of goods and services a unit of money can buy.

Inflation (increases/decreases) purchasing power.  
Rapid inflation (increases/decreases) acceptability.



# Money Classification

**Liquidity**- ease with which an asset can be accessed and used as a medium of exchange

## **M1 (Highest Liquidity)** –

1. Currency in circulation
2. Checkable bank deposits (checking accounts)
3. Traveler's checks

## **M2 (Near-Moneys)** - M1 plus the following:

1. Savings deposits (money market accounts)
2. Time deposits (CDs = certificates of deposit)
3. Money market funds

**M1 and M2 money often earn little to no interest so the opportunity cost of holding liquid money is the interest you could be earning**

# Credit vs. Debit Cards

**What is the difference between credit cards and debit cards?**

**Are credit cards money?**

**A credit card is NOT money. It is a short-term loan (usually with a higher-than-normal interest rate).**

**Ex: You buy a shirt with a credit card, VISA pays the store, you pay VISA the price of the shirt plus interest and fees.**

**Total credit cards in circulation in U.S: 1.8 Billion**

**Average number of credit cards per cardholder: 3.75**

**Average credit card debt per household : \$15,355**





# The Financial Sector

**Individuals, businesses, and governments borrow and save so they need institutions to help**

- **Financial Sector- Network of institutions that link borrowers and lenders including banks, mutual funds, pension funds, and other financial intermediaries**
  - **Assets- Anything tangible or intangible that is owned**
  - **Liability- Anything that is owed**
  - **Loan- An agreement between a lender and a borrow. Usually at a fee called the interest rate.**
- A loan is an asset for the lender and a liability for the borrower**

# **Personal Finance and Investment**

**Personal finance refers to the way individuals and families budget, save, and spend.**

**In a personal finance class you learn about checking and savings accounts, credit cards, loans, the stock market, retirement plans, and how to manage your assets**

**The word “INVESTMENT” in econ will always refer to business spending on tools and machinery.**

**A low interest rate will increase investment**



# Bonds vs. Stocks

Pretend you are going to start a lemonade stand. You need some money to get started. **What do you do?**

You ask your grandmother to lend you \$100

Your grandmother just bought a bond.

- **Bonds are loans, or IOUs, that represent debt that the government, business, or individual must repay to the lender.**
- **The bond holder has NO OWNERSHIP of the company.**

To get more money, you could sell half of your company and issue shares of stock.

- **Stocks- Represents ownership of a corporation and the stockholder is often entitled to a portion of the profit**

# Bonds Prices and Interest Rates

A bond is issued at a specific interest rate that doesn't change throughout the life of the bond.

**Example:** Assume a 30 year US Treasury bond has a face value of \$1000 and the interest rate is 5%. Each year, for 30 years, you will get \$50.

If the interest rate falls and new bonds are being issued at 3% then people would rather have the old 5% bonds.

If you like, you can sell bonds before they mature

If you sold the original 5% bond, buyers would bid up the price since they would rather have 5%

**The Point: Bond price and interest rates are inversely related**

# The Time Value of Money

Would you rather have \$100 today or \$200 in the future?

**You can determine the future value of any amount (\$X) if you know the interest rate (ir) and the number of years (N)**

**Equation to Calculate Future Value**

$$\text{\$X in N Years} = \text{\$X} (1 + \text{ir})^N$$

**If the interest rate is 10% then the future value of \$100 is \$110.**

$$\text{Future Value of } \$100 \text{ in 1 Year} = \$100 (1 + .1) = \$110$$

**What is the present value of \$100 in one year if the interest rate is 10%?**



**Present Value- The current worth of some future amount of money.**

**Equation to Calculate Present Value**

$$\text{Present Value of } \$X \text{ in 1 Year} = \frac{\$X}{(1 + ir)^N}$$

$$\text{Present Value of } \$100 \text{ in 1 Year} = \frac{\$100}{(1 + .1)^1} = \$90.91$$

**If the interest rate is 10%, the present value of \$100 is \$90.91**

**So, this means that the future value of \$90.91 when the interest rate is 10% is \$100**

**Unit 4:**  
**Money and**  
**Monetary Policy**

# The Money Market

## (Supply and Demand for Money)



# The Demand for Money

**At any given time, people demand a certain amount of liquid assets (money) for two different reasons:**

- 1. Transaction Demand for Money- People hold money for everyday transactions.**
- 2. Asset Demand for Money - People hold money since it is less risky than other assets**

**What is the opportunity cost of hold keeping money in your pocket or checking account?**

**The interest you could be earning from other financial assets like stocks, bonds, and real estate**

# The Demand for Money

1. What happens to the quantity demanded of money when interest rates increase?

**Quantity demanded falls because individuals would prefer to have interest earning assets instead**

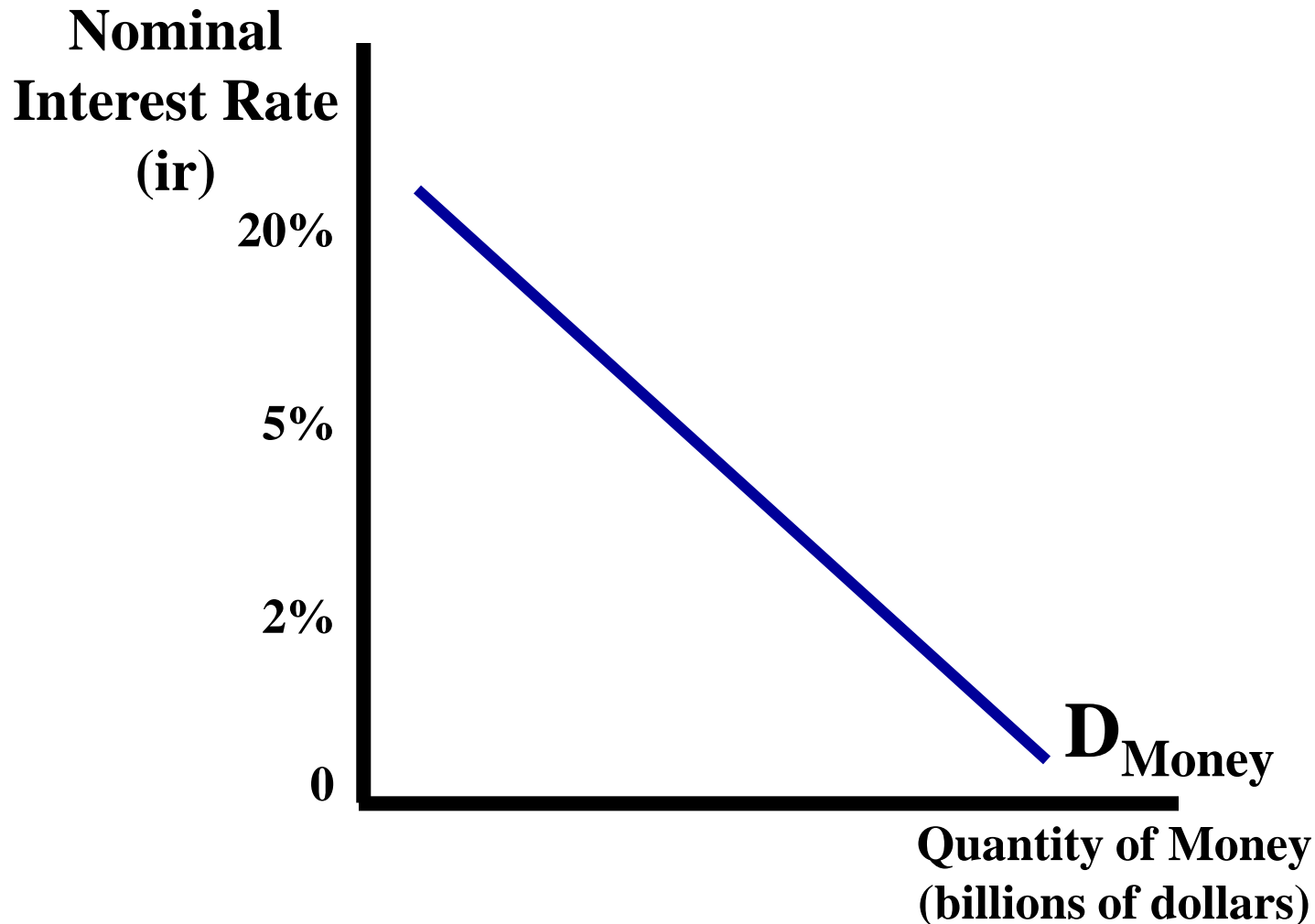
2. What happens to the quantity demanded when interest rates decrease?

**Quantity demanded increases. There is no incentive to convert cash into interest earning assets**

**There is an inverse relationship between the interest rate and the quantity of money demanded**

# The Demand for Money

**Inverse relationship between interest rates and the quantity of money demanded**



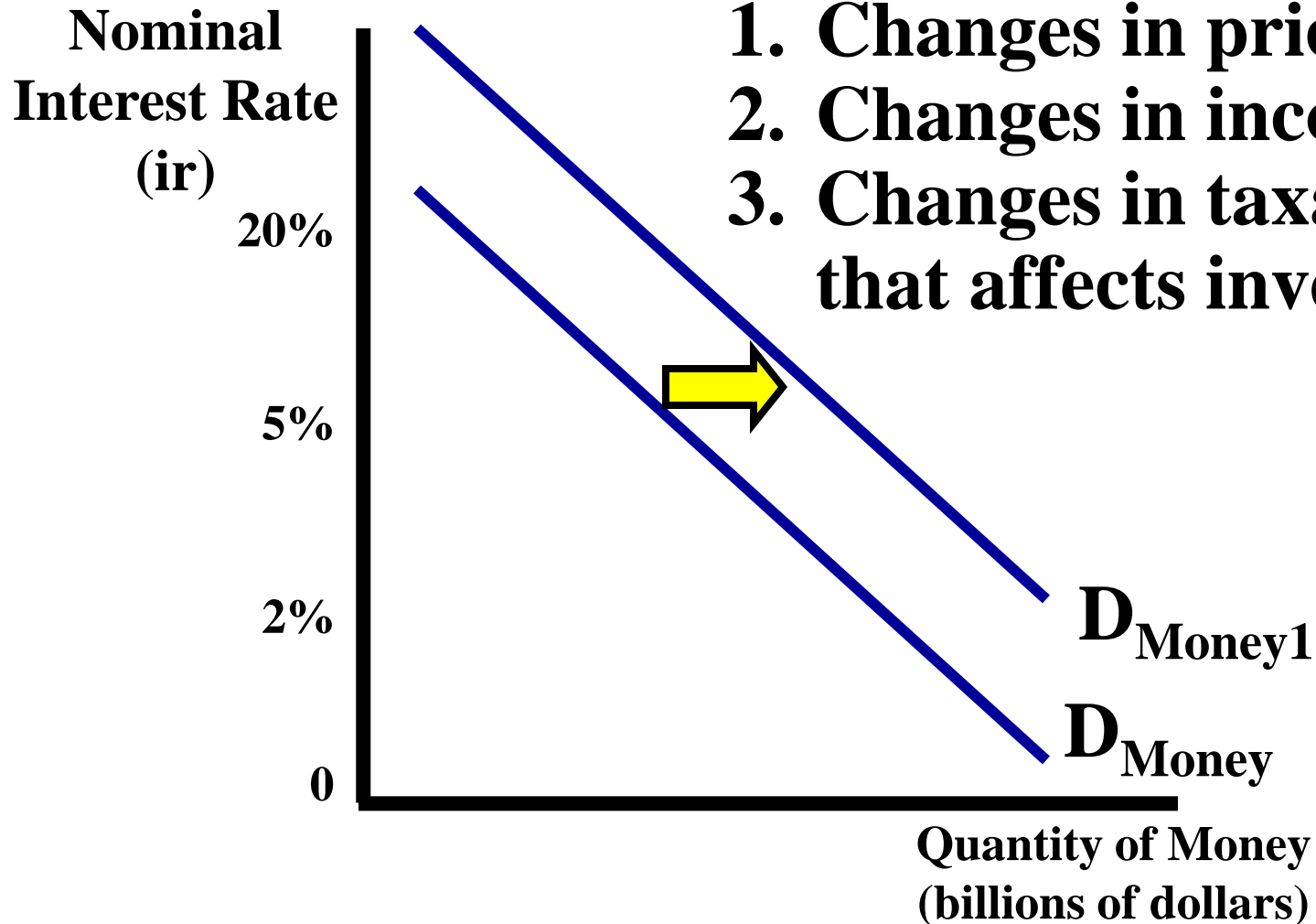


# The Demand for Money

What happens if price level increase?

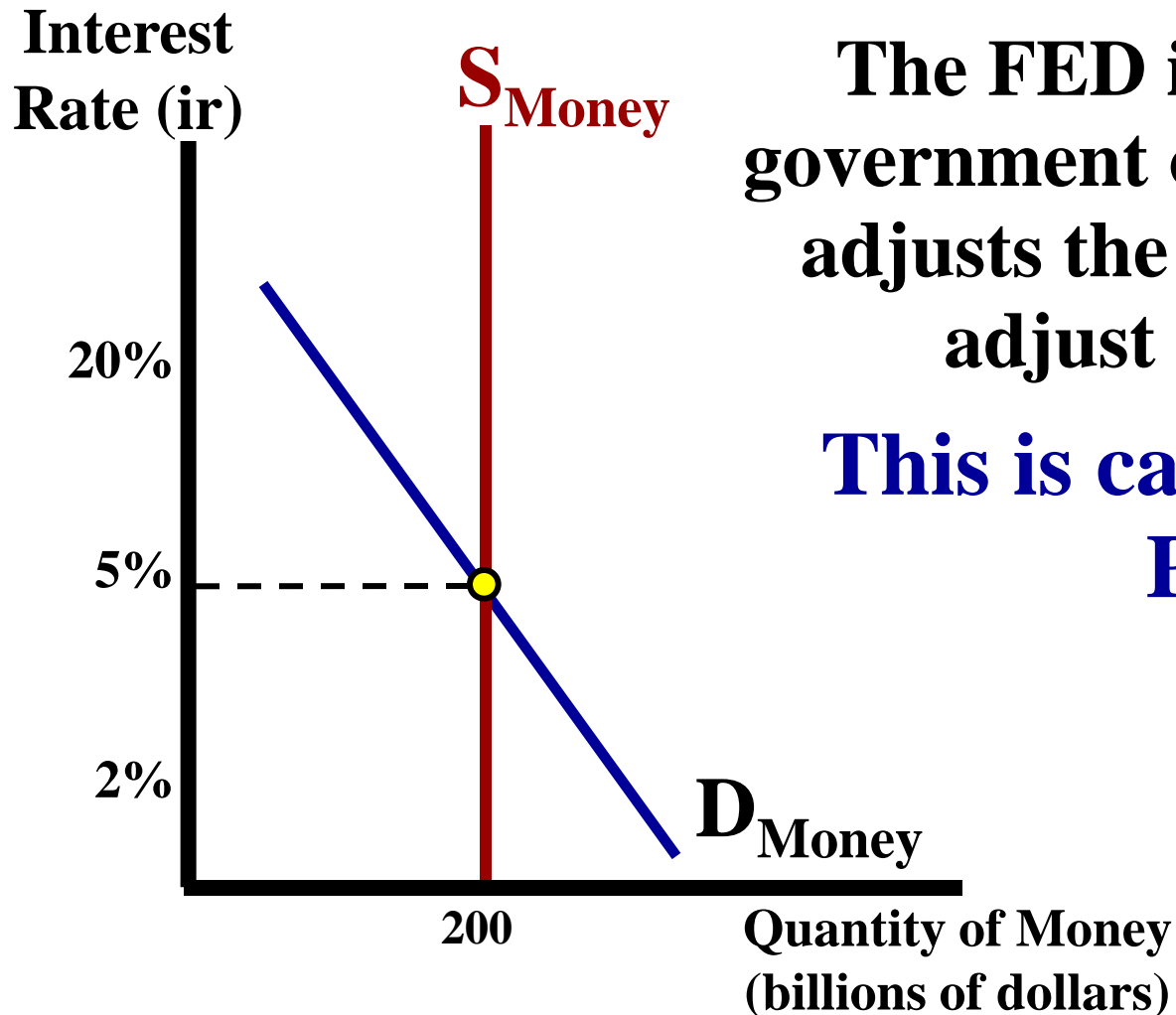
## Money Demand Shifters

1. Changes in price level
2. Changes in income
3. Changes in taxation that affects investment



# The Supply for Money

The U.S. Money Supply is set by the Board of Governors of the Federal Reserve System (FED)



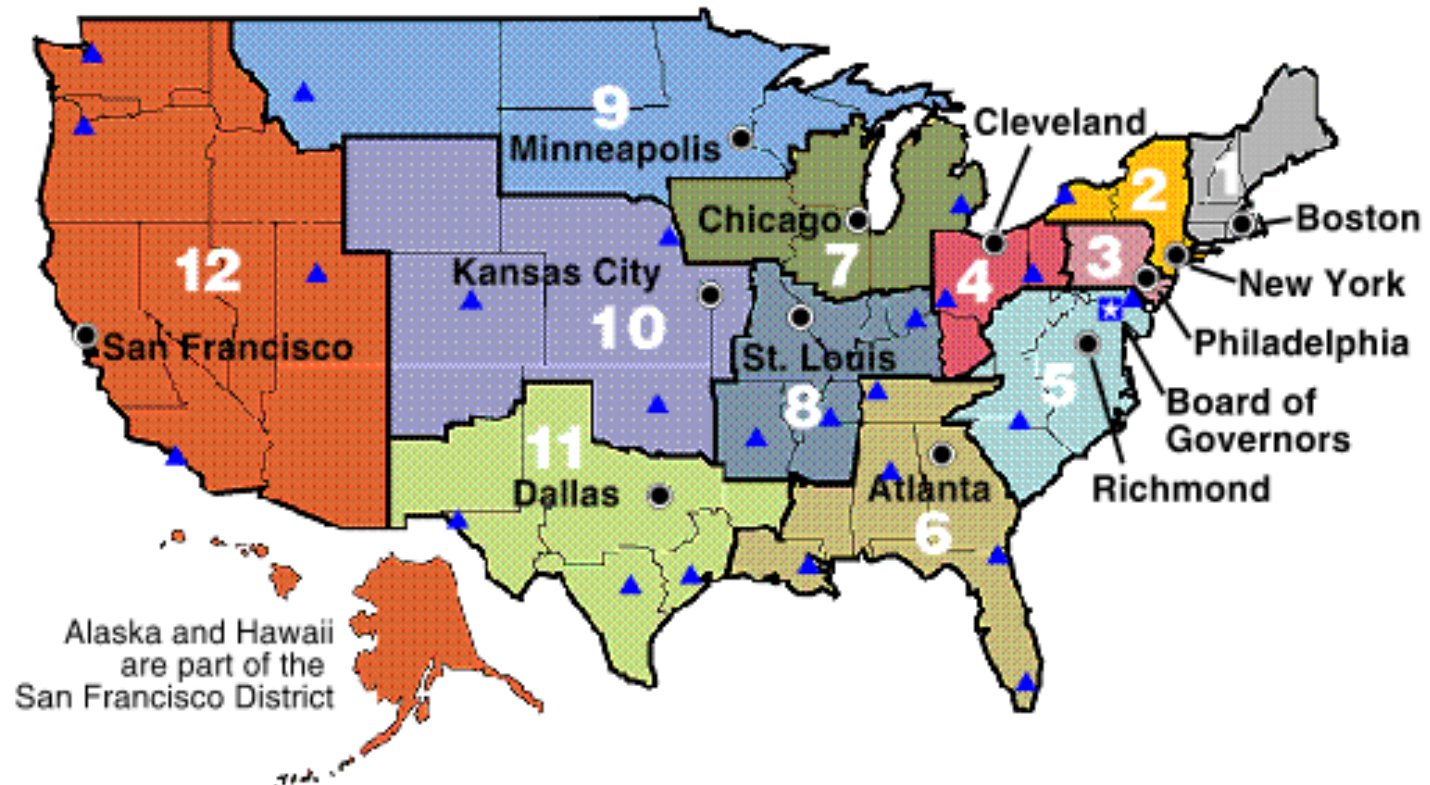
The FED is a nonpartisan government office that sets and adjusts the money supply to adjust the economy

This is called Monetary Policy.

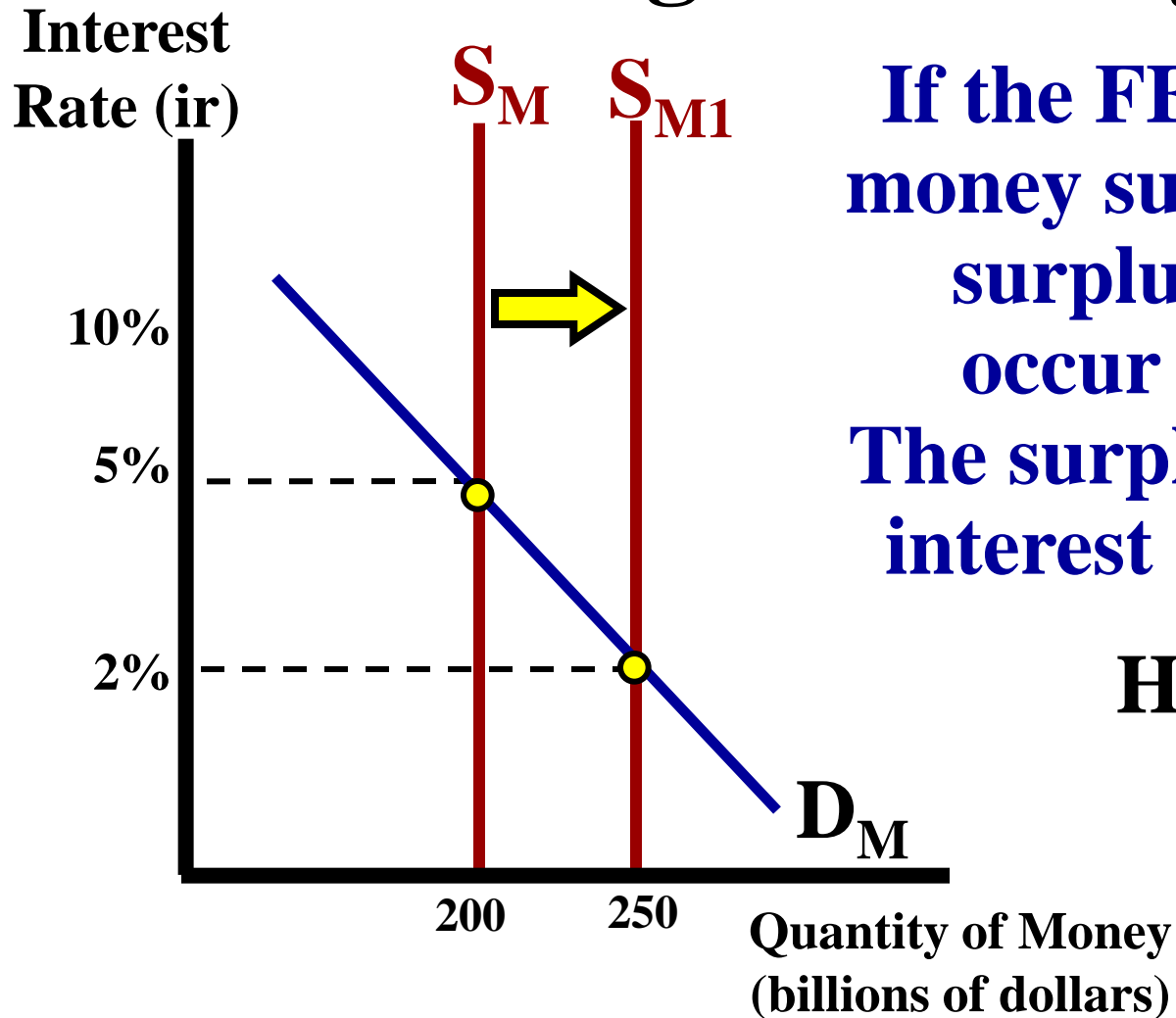


# Monetary Policy

When the FED adjusts the money supply to achieve the macroeconomic goals



# Increasing the Money Supply

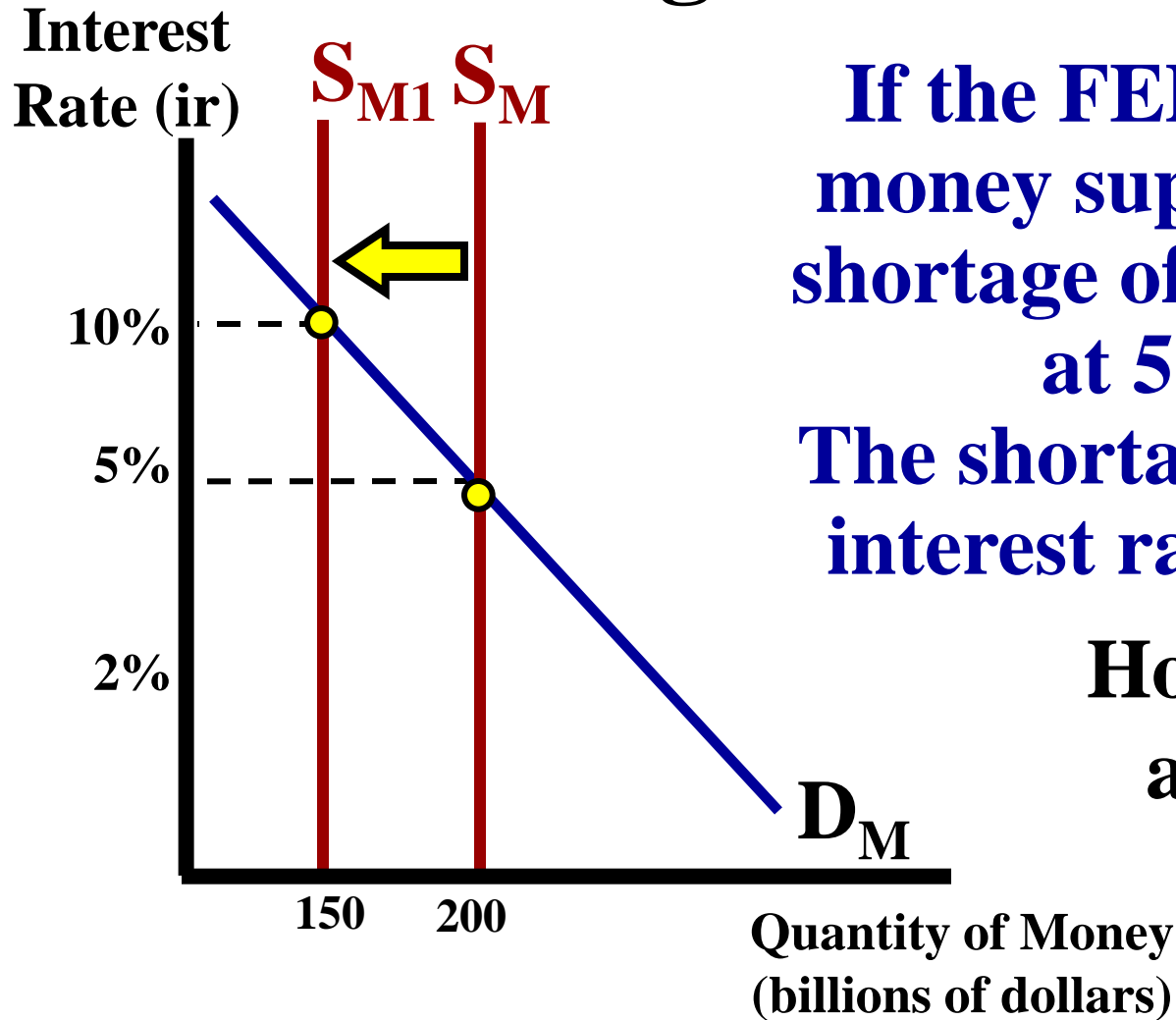


If the FED increases the money supply, a temporary surplus of money will occur at 5% interest. The surplus will cause the interest rate to fall to 2%

How does this affect AD?

Increase money supply → Decreases interest rate → Increases investment → Increases AD

# Decreasing the Money Supply



If the FED decreases the money supply, a temporary shortage of money will occur at 5% interest.

The shortage will cause the interest rate to rise to 10%

How does this affect AD?

Decrease money supply → Increase interest rate → Decrease investment → Decrease AD

# Fractional Reserve Banking

**When banks hold only a small portion of deposits to cover potential withdrawals and then loans the rest of the money out.**

**If we all went to the bank to withdrawal money at the same time what would happen?**

**BANK RUN!**



# Bank Balance Sheets

**Demand Deposits**- Money deposited in a commercial bank in a checking account

**Required Reserves**- The percent that banks must hold by law

**Excess Reserves**- The amount that the bank can loan out

**Balance Sheet**- A record of a bank's assets, liabilities, and net worth.

**Are demand deposits in a bank an asset or a liability?**

**Liability for the bank, asset to the depositor**

# Bank Balance Sheets

Assets		Liabilities	
Loans	\$8,000	Demand Deposits	\$5,000
Reserves	\$500	Owner's Equity	\$5,000
Treasury Bonds	\$1,500		
<b>Total Assets</b>	<b>\$10,000</b>	<b>Total Liabilities</b>	<b>\$10,000</b>

**It is “balanced” because the totals must equal**

**If the bank is holding no excess reserves, how much is the required reserve ratio?**

**.1 or 10%**

**Unit 4:**  
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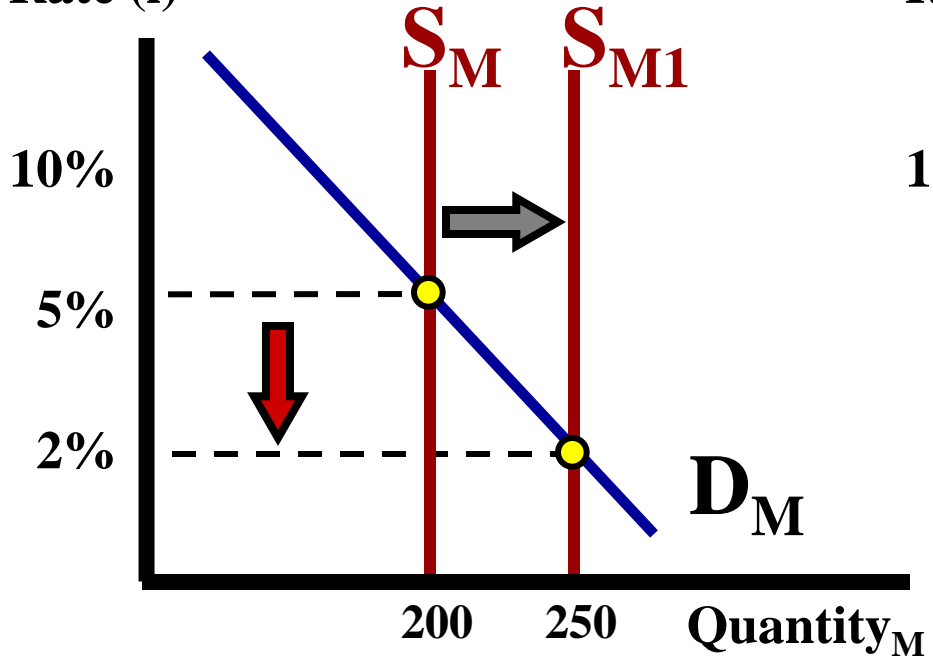
# Showing the Effects of Monetary Policy Graphically

## Three Related Graphs:

- Money Market
- Investment Demand
- AD/AS

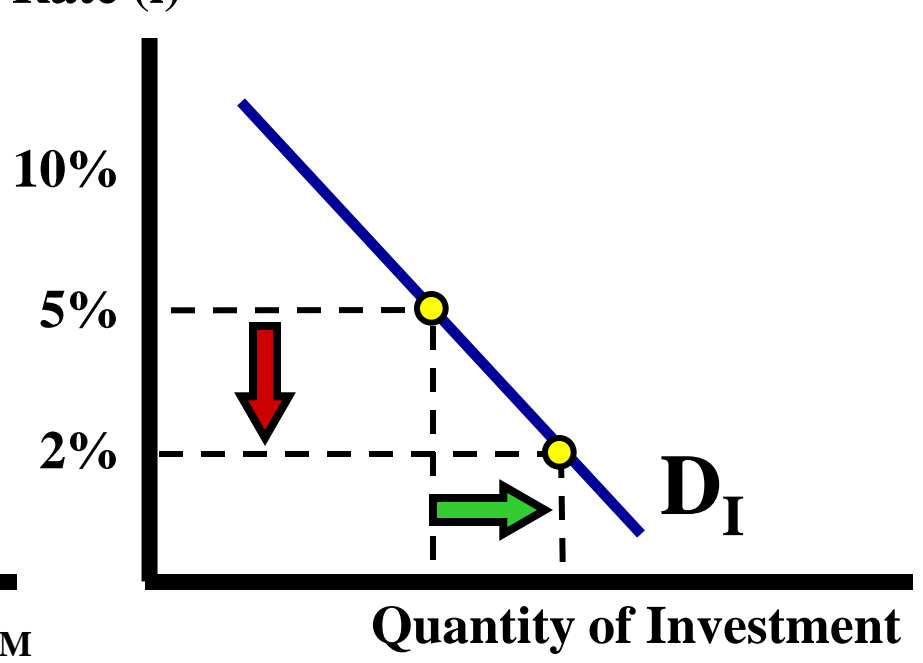
Interest Rate (i)

### S&D of Money



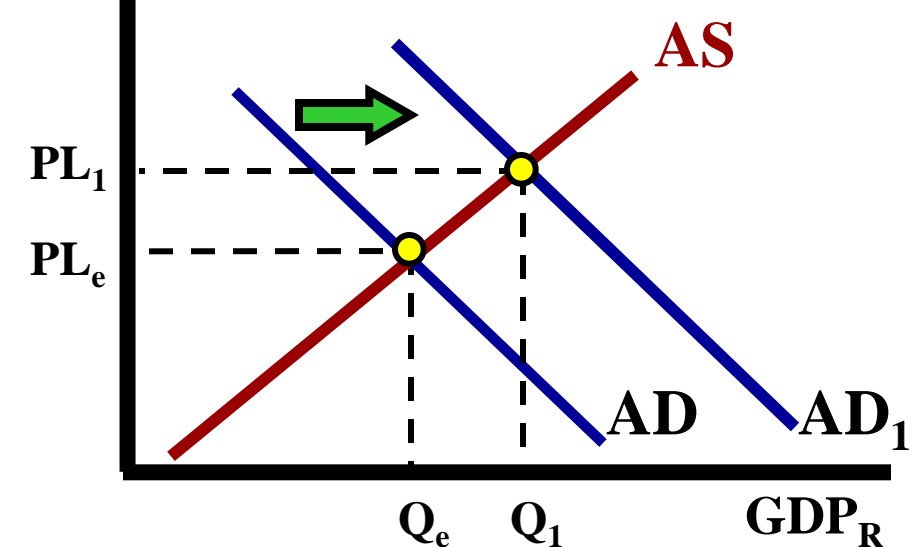
Interest Rate (i)

### Investment Demand



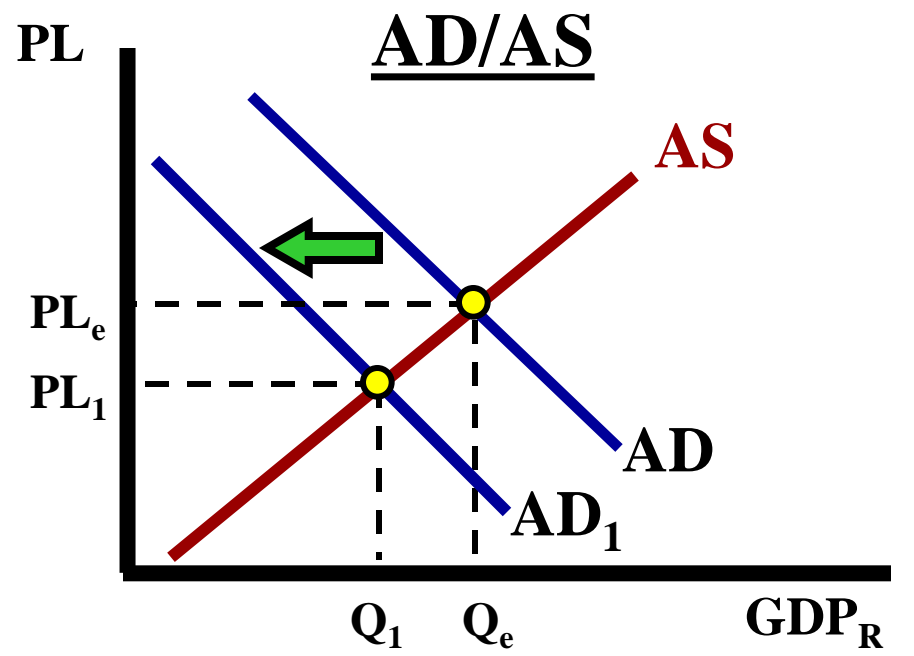
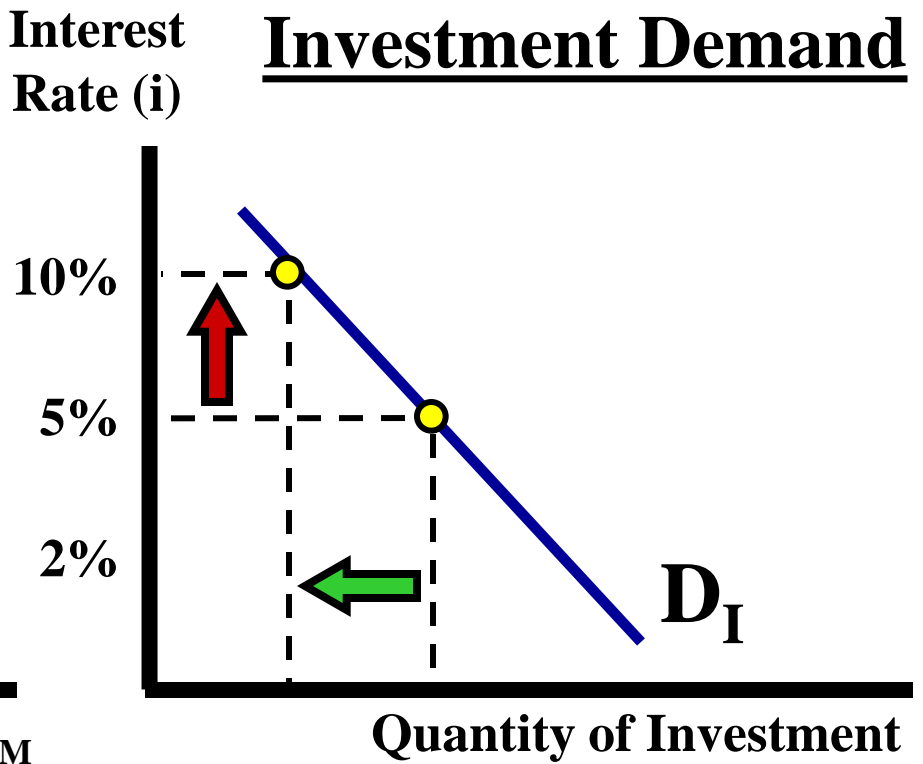
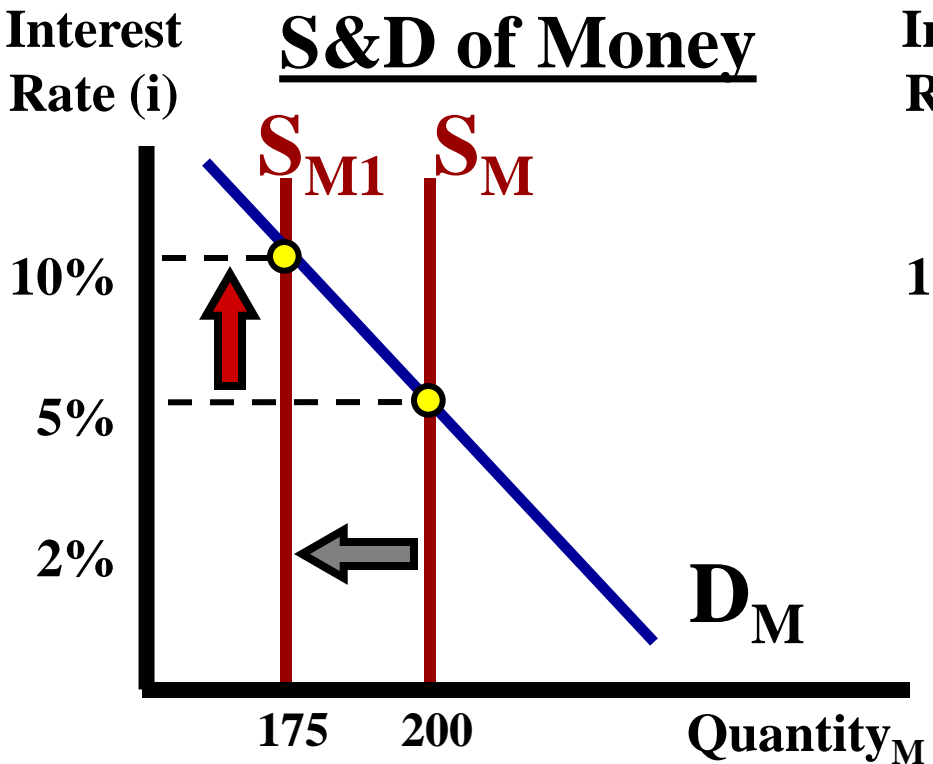
PL

### AD/AS



**The FED increases the money supply to stimulate the economy...**

- 1. Interest Rates Decreases**
- 2. Investment Increases**
- 3. AD, GDP and PL Increases**



**The FED decreases the money supply to slow down the economy...**

- 1. Interest Rates increase**
- 2. Investment decreases**
- 3. AD, GDP and PL decrease**

**Wait, why would the FED ever want to slow down the economy?**

**To fight inflation**

**The role of the Fed is to “take away the punch bowl just as the party gets going”**



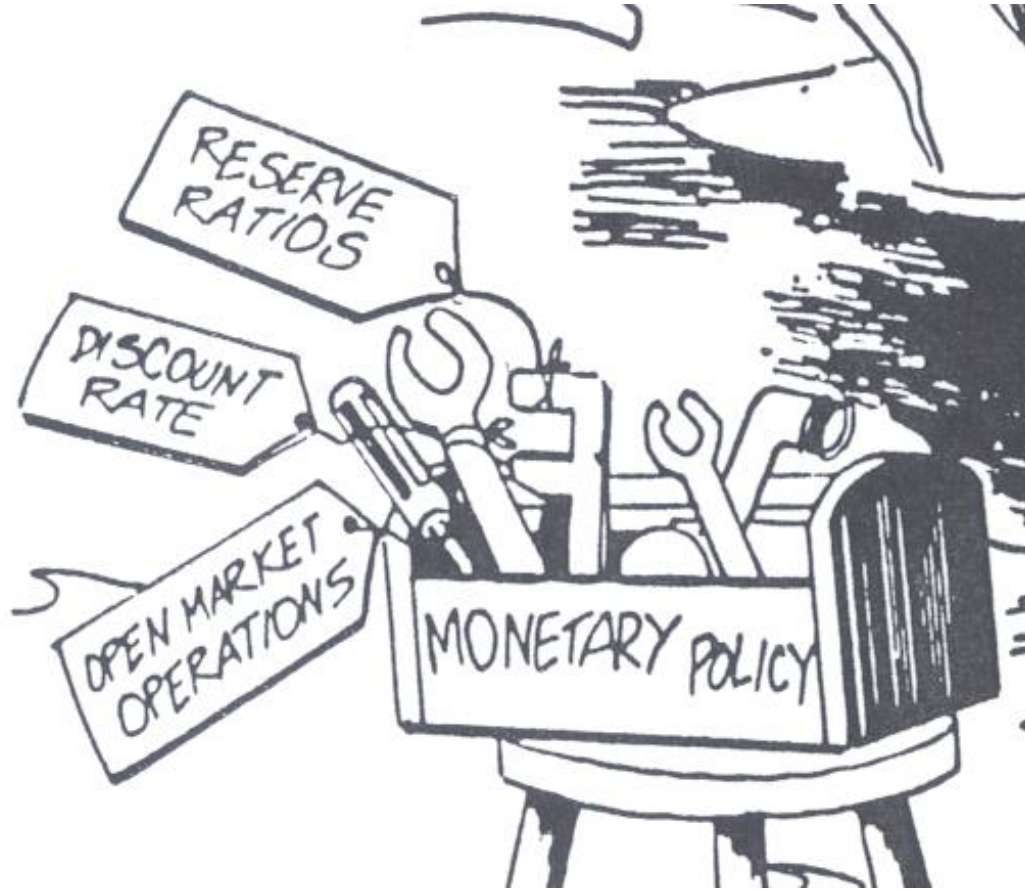
# How the Government Stabilizes the Economy





# How the FED Stabilizes the Economy

## These are the three Shifters of Money Supply



# 3 Shifters of Money Supply

The FED adjusting the money supply by changing any one of the following:

1. Setting **Reserve Requirements (Ratios)**

2. Lending Money to Banks & Thrifts

- **Discount Rate**

3. Open Market Operations

- **Buying and selling Bonds**

The FED is now chaired by Janet Yellen.



# #1. The Reserve Requirement

**If you have a bank account, where is your money?**

**Only a small percent of your money is in the safe. The rest of your money has been loaned out.**

**This is called “Fractional Reserve Banking”**

**The FED sets the amount that banks must hold**

**The reserve requirement (reserve ratio) is the percent of deposits that banks must hold in reserve (the percent they can NOT loan out)**

- **When the FED increases the money supply it increases the amount of money held in bank deposits.**
- **As banks keeps some of the money in reserve and loans out their excess reserves**
- **The loan eventually becomes deposits for another bank that will loan out their excess reserves.**

# The Money Multiplier

**Example:** Assume the reserve ratio in the US is 10%

**You deposit \$1000 in the bank**

**The bank must hold \$100 (required reserves)**

**The bank lends \$900 out to Bob (excess reserves)**

**Bob deposits the \$900 in his bank**

**Bob's bank must hold \$90. It loans out \$810 to Jill**

**Jill deposits \$810 in her bank**

**SO FAR, the initial deposit of \$1000 caused the CREATION of another \$1710 (Bob's \$900 + Jill's \$810)**

$$\text{Money Multiplier} = \frac{1}{\text{Reserve Requirement (ratio)}}$$

**Example:**

- If the reserve ratio is .20 and the money supply increases 2 Billion dollars. How much did the money supply increase?**

# Using Reserve Requirement

**1. If there is a recession, what should the FED do to the reserve requirement? (Explain the steps.)**

## **Decrease the Reserve Ratio**

- 1. Banks hold less money and have more excess reserves**
- 2. Banks create more money by loaning out excess**
- 3. Money supply increases, interest rates fall, AD goes up**

**2. If there is inflation, what should the FED do to the reserve requirement? (Explain the steps.)**

## **Increase the Reserve Ratio**

- 1. Banks hold more money and have less excess reserves**
- 2. Banks create less money**
- 3. Money supply decreases, interest rates up, AD down**

## #2. The Discount Rate

**The Discount Rate is the interest rate that the FED charges commercial banks.**

**Example:**

- **If Bank of America needs \$10 million, they borrow it from the U.S. Treasury (which the FED controls) but they must pay it back with 3% interest.**

**To increase the Money supply, the FED should DECREASE the Discount Rate (Easy Money Policy).**

**To decrease the Money supply, the FED should INCREASE the Discount Rate (Tight Money Policy).**

# #3. Open Market Operations

- **Open Market Operations is when the FED buys or sells government bonds (securities).**
- **This is the most important and widely used monetary policy**

**To increase the Money supply, the FED should BUY government securities.**

**To decrease the Money supply, the FED should SELL government securities.**

**How are you going to remember?**

**Buy-BIG- Buying bonds increases money supply**

**Sell-SMALL- Selling bonds decreases money supply**

# Practice

**Don't forget the Monetary Multiplier!!!!**

- 1. If the reserve requirement is  $.5$  and the FED sells \$10 million of bonds, what will happen to the money supply?**
- 2. If the reserve requirement is  $.1$  and the FED buys \$10 million bonds, what will happen to the money supply?**
- 3. If the FED decreases the reserve requirement from  $.50$  to  $.20$  what will happen to the money multiplier?**



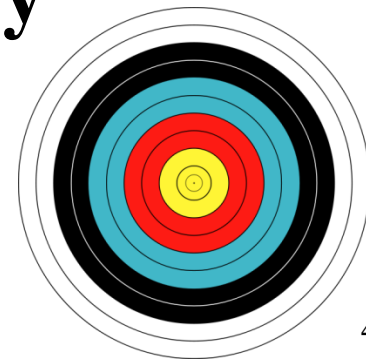
# Federal Funds Rate

**The federal funds rate is the interest rate that banks charge one another for one-day loans of reserves.**

**The FED can't simply tell banks what interest rate to use. Banks decide on their own.**

**The FED influences them by setting a target rate and using open market operation to hit the target**

**The federal funds rate fluctuates due to market conditions but it is heavily influenced by monetary policy (buying and selling of bonds)**



**Unit 4:**  
**Money and**  
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# **THE FED**

## **Monetary Policy**

# Interest Rates and Inflation

What are interest rates? Why do lenders charge them?

**Who is willing to lend me \$100 if I will pay a total interest rate of 100%?**

(I plan to pay you back in 2050)

**If the nominal interest rate is 10% and the inflation rate is 15%, how much is the REAL interest rate?**

## Real Interest Rates-

The percentage increase in purchasing power that a borrower pays. (adjusted for inflation)

**Real = nominal interest rate - expected inflation**

## Nominal Interest Rates-

the percentage increase in money that the borrower pays not adjusting for inflation.

**Nominal = Real interest rate + expected inflation**

# Nominal vs. Real Interest Rates

## **Example #1:**

**You lend out \$100 with 20% interest. Inflation is 15%.  
A year later you get paid back \$120.**

**What is the nominal and what is the real interest rate?  
Nominal interest rate is 20%. Real interest rate was 5%  
In reality, you get paid back an amount with less  
purchasing power.**

## **Example #2:**

**You lend out \$100 with 10% interest. Prices are expected  
to increased 20%. In a year you get paid back \$110.**

**What is the nominal and what is the real interest rate?  
Nominal interest rate is 10%. Real rate was -10%**

**In reality, you get paid back an amount with  
less purchasing power.**

**So far we have only been looking at  
NOMINAL interest rates.**

**What about REAL interest rates?**

# Loanable Funds Market



# Loanable Funds Market

**Is an interest rate of 50% good or bad?**

**Bad for borrowers but good for lenders**

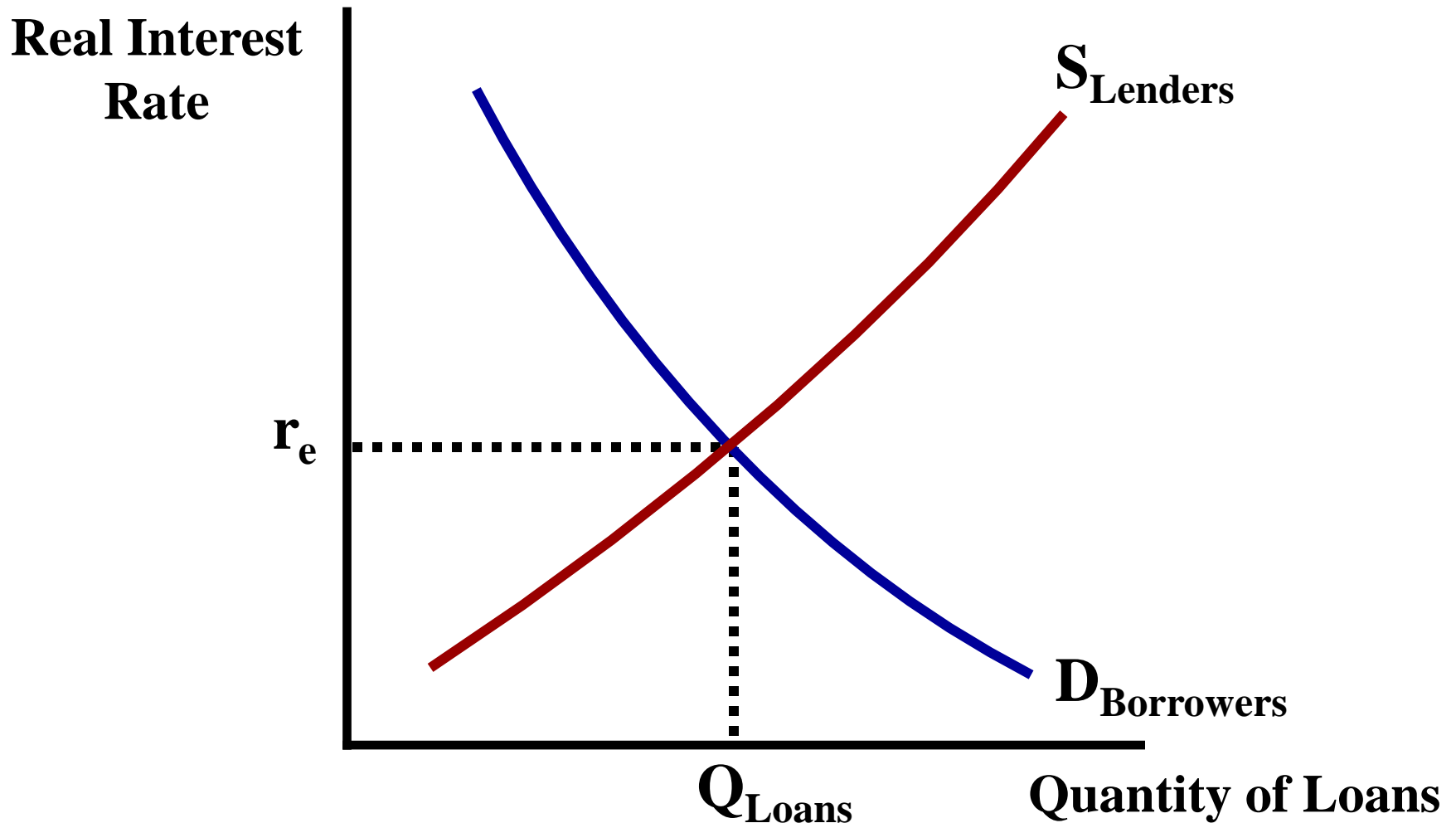
**The loanable funds market is the private sector supply and demand of loans.**

- **This market shows the effect on REAL INTEREST RATE**
  - **Demand- Inverse relationship between real interest rate and quantity loans demanded**
  - **Supply- Direct relationship between real interest rate and quantity loans supplied**
- This is NOT the same as the money market.**  
**(supply is not vertical)**



# Loanable Funds Market

At the equilibrium real interest rate the amount borrowers want to borrow equals the amount lenders want to lend.

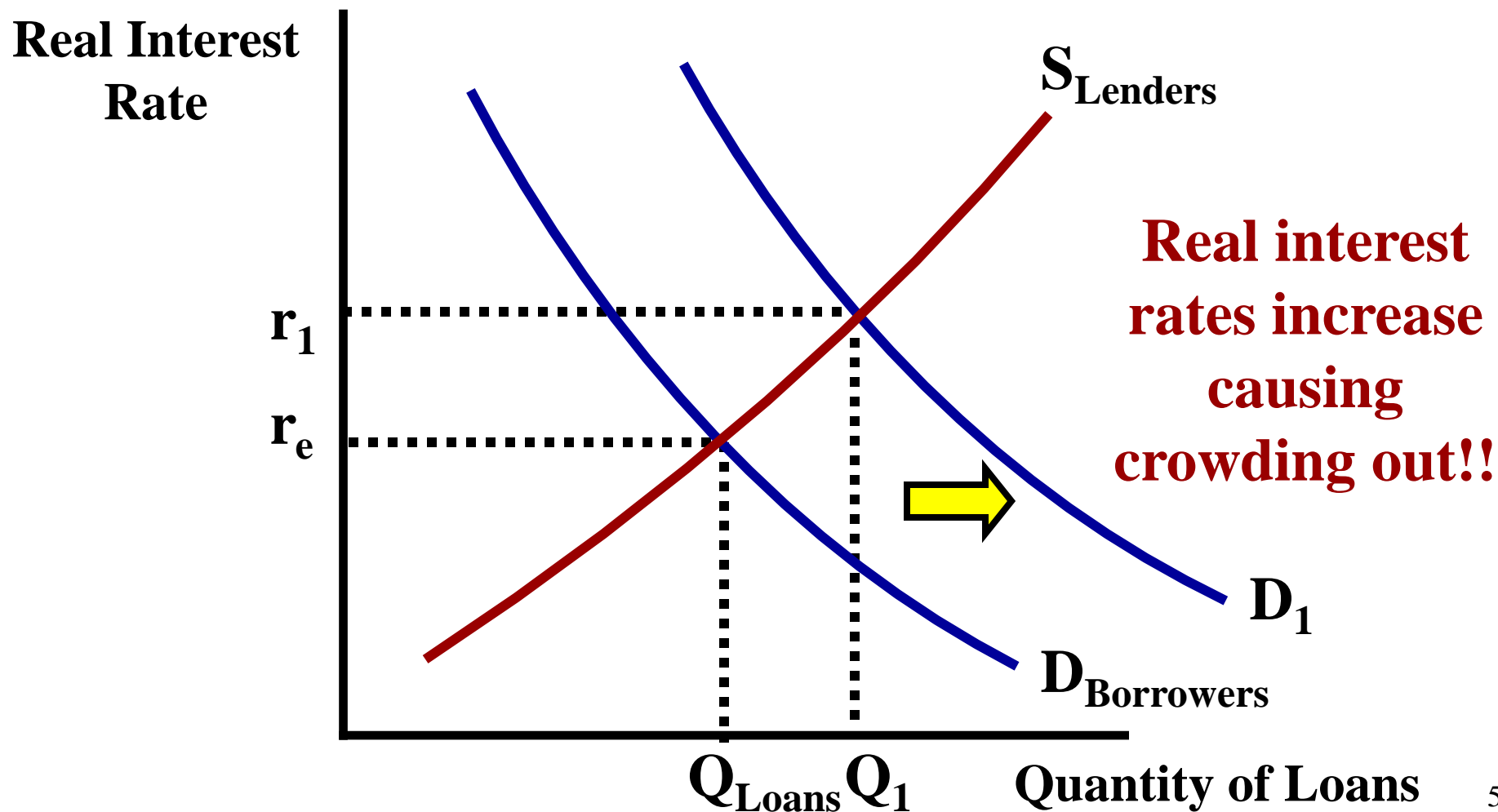


# Loanable Funds Market

**Example: The Gov't increases deficit spending?**

**Government borrows from private sector**

**Increasing the demand for loans**



# Loanable Funds Market

## Demand Shifters

1. Changes in perceived business opportunities
2. Changes in government borrowing
  - Budget Deficit
  - Budget Surplus

## Supply Shifters

1. Changes in private savings behavior
2. Changes in public savings
3. Changes in foreign investment
4. Changes in expected profitability