

You matter! Monday, March 11 + Tuesday, March 12

- Warm up: Tell your neighbor that they matter and that you care about how they are doing. Then, ask them how they are doing today and have a conversation about nominal vs. real interest rates and nominal vs. real wages.
- *Learning target: I can explain how the price of bonds changes on the open market as a result of changes in nominal interest rates. I can explain nominal vs. real interest rates and the time value of money. I can also explain the Quantity Theory of Money.*
- ***Unit 4 test: Tues, 3/19 for A day; Wed, 3/20 for B day***
- ***Expect one quiz each week, typically on the last day that I see you during the week. Quizzes will be over material we've covered recently. I'll let you know when I will start adding content from earlier units.***
- **Winter and Charlotte need to make up last week's quiz**

Nominal vs. Real Interest Rates



Interest Rates and Inflation

Who is willing to lend me \$100 if I will pay a total interest rate of 100%? (I plan to pay you back in the year 2050)

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

Real = nominal interest rate - expected inflation

Nominal = Real interest rate + expected inflation

Nominal vs. Real Interest Rates

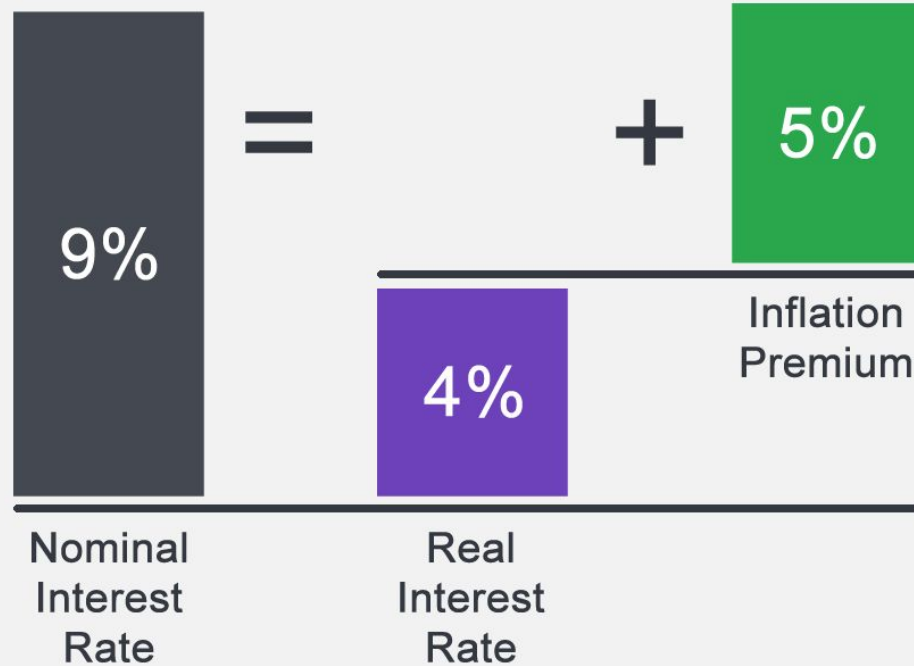
Example #1:

- 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 money w/ 5% more 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.

Nominal vs. Real Interest Rate



Bonds vs. Stocks

How could you raise money to start a lemonade stand?

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 and is paid interest.

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

- Stocks represent ownership of a corporation and the stockholder is often entitled to a portion of the profit paid out as dividends.

Bonds Prices and Interest Rates

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

How do changes in the interest rate affect bond price?

- When you buy bonds, you can wait for them to mature or you can sell them off early.
- Assume you bought a bond at a 5% interest rate that will mature in 10 years.
- If the interest rates increases to 10%, will buyers be more or less interested in buying your bond?
- What will happen to the price of your bond?
- Buyers would be less interested in your bond so the price would decrease.
- Interest rates and bond prices are inversely related!

Bonds Prices and Interest Rates

Example: Assume a 30-year U.S. 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.

Let's Play the Pyramid!

Round 1

1. The demand for money
2. What a cow might say
3. Assets
4. Balance sheet
5. Things that are fluffy
6. Capital expenditures
7. The four factors of production

Round 2

1. Monetary policy
2. Liabilities
3. Open market operations
4. What a bird might say
5. Excess reserves
6. Taxing and spending
7. Things that are sweet

The Time Value of Money

The idea of the time value of money is a valuable tool in finance and can help us understand interest rates and saving. However, using the equations and calculating the future value of a specific amount of money is not tested much on the AP exam.



Think About It:

**Would you rather have \$100 today or
\$200 in 5 years from now?**

**What other information would you need to
have be able to make an informed
decision?**

Time Value of Money

- A dollar you receive today is worth more than a dollar you might receive in the future. Why?
 - Because a dollar can earn interest for you over time.

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

Equation to Calculate Future Value:

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

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

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

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

What is the future value of \$100 in three years if the interest rate is 10%?

What is the future value of \$100 in one year if the interest rate is 20%?

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

Equation to Calculate Present Value:

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

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

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

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

Are you ready for a FUN set?!



You are awesome! Wednesday, March 13 + Thursday, March 14

- Warm up: Talk to your neighbor about this unit and the study guide--come up with at least two questions that you have about what we've covered.
- *Learning target: I can also explain the Quantity Theory of Money. I can explain the loanable funds market and the related graph.*
- ***Unit 4 test: Tues, 3/19 for A day; Wed, 3/20 for B day***
- ***Expect one quiz each week, typically on the last day that I see you during the week. Quizzes will be over material we've covered recently. I'll let you know when I will start adding content from earlier units.***
- ***Next Ever Fi is due Monday, March 18***

Tutorial--Tuesdays & Thursday, plus this
coming Monday

Leakage

Leakage occurs when taxes, savings, and imports remove income from the circular flow system.

1. Under which of the following conditions would consumer spending most likely increase?
 - a. Consumers have large unpaid balances on their credit cards
 - b. Consumers' wealth is increased by changes in the stock market
 - c. The government encourages consumers to increase their savings
 - d. Social security taxes are increased
 - e. Consumers believe they will not receive pay increases next year
2. Which of the following can be considered a leakage from the circular flow of economic activity?
 - a. Investment
 - b. Government expenditures
 - c. Consumption
 - d. Exports
 - e. Saving

Equation of Exchange or the Quantity Theory of Money

- Quantity theory of money: a theory that emphasizes the positive relationship between price level and money supply.
 - It relies on the equation $M \times V = P \times Y$ where:
 - M = money supply
 - V = velocity (measure of the number of times the average dollar bill in the economy turns over per year btw buyers and sellers)
 - P = price level
 - Y = real GDP

Equation of Exchange or the Quantity Theory of Money

- $M \times V = P \times Y$ Where:
 - MV is the amount spent by consumers. This is the same as the total $C + I + G + X_n$
 - PY is the amount received by sellers. This is the same as nominal GDP (current output at current prices)

GDP & Money Supply

- The “equation of exchange” defines the relationship between money and economic activity
- Let’s [track](#) a dollar bill . . . (from the tip you left at Starbucks in ATL, to the flowers the barista bought in Macon for her mother’s birthday, to the souvenir the florist bought in Seattle . . .)

Equation of Exchange or the Quantity Theory of Money

- When the money supply (M) changes, if the economy is at full capacity then P increases. If the economy is not at full capacity (Y_f), then Y increases with a possible increase in price level.
 - I.e., an increase in M not offset by an increase in real output will result in inflation

Videos on Velocity of Money & Inflation

- [Marginal Revolution University](#)
- [Part II](#)

**So far we have only been looking at
NOMINAL interest rates.
What about REAL interest rates?**

Loanable Funds Market



Loanable Funds Market

Is a real interest rate of 50% good or bad?

Bad for borrowers but good for lenders.

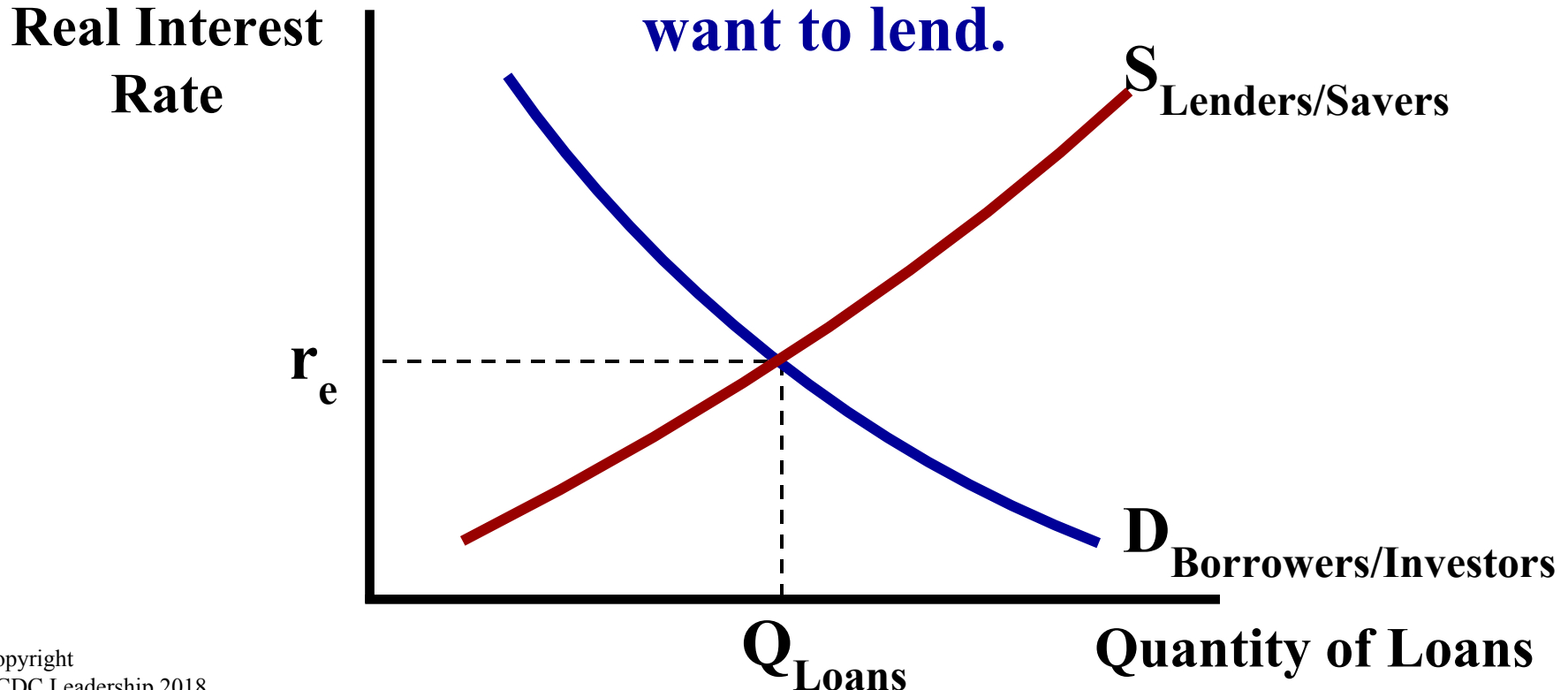
The loanable funds market is a hypothetical market that represents the private sector supply and demand of loans.

- **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.

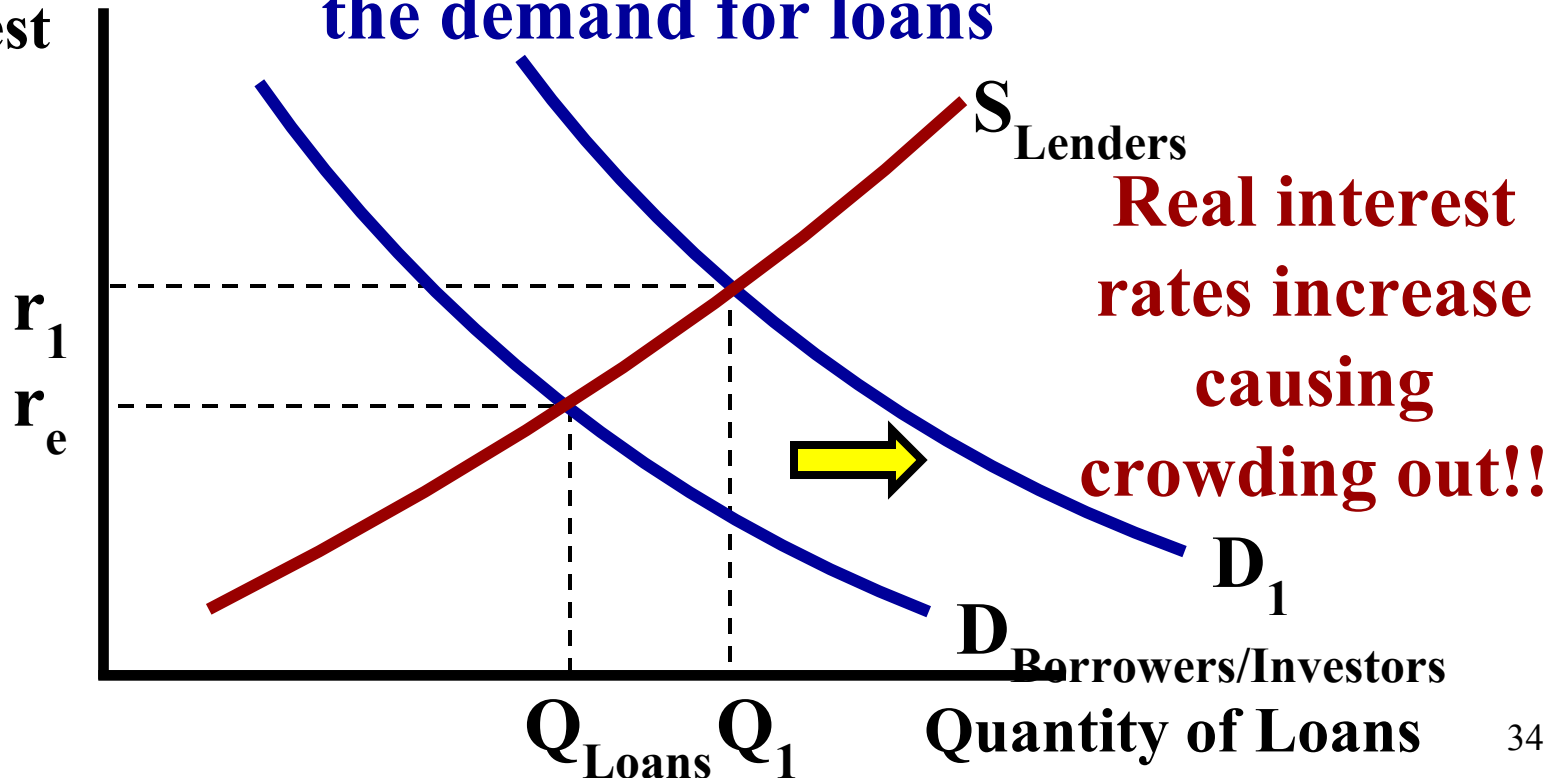


Loanable Funds Market

Example: The Gov't increases deficit spending.

Government borrows from private sector increasing the demand for loans

Real Interest Rate



Loanable Funds Market

Demand Shifters

1. Changes in borrowing by consumers
2. Changes in borrowing by businesses (investment spending); for example caused by changes in perceived business opportunities
3. Changes in borrowing by the government (ex: deficit spending increases D_{lf})

Demand for loans comes from borrowers/investors

Loanable Funds Market

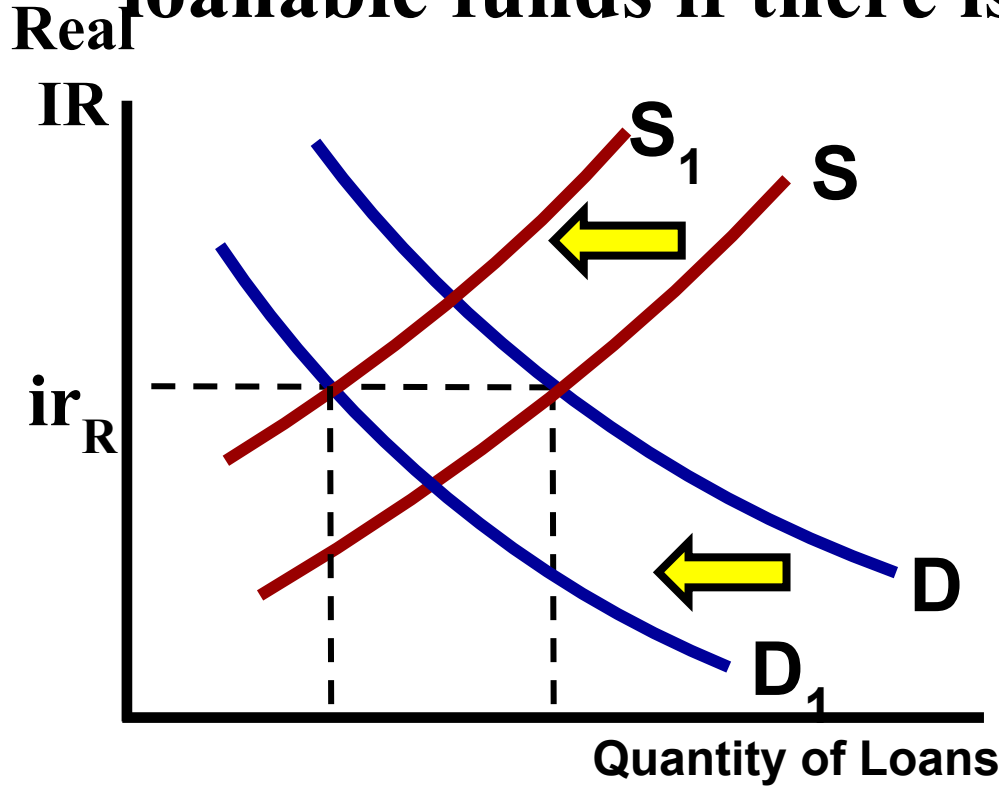
Supply Shifters

1. **Changes in private savings behavior**
2. **Changes in public savings**
3. **Changes in foreign investment (ex: more inflow of foreign financial capital)**

Supply for loans comes from lenders/savers

What will happen to the demand and supply for loanable funds if there is political instability?

Demand and supply both shift

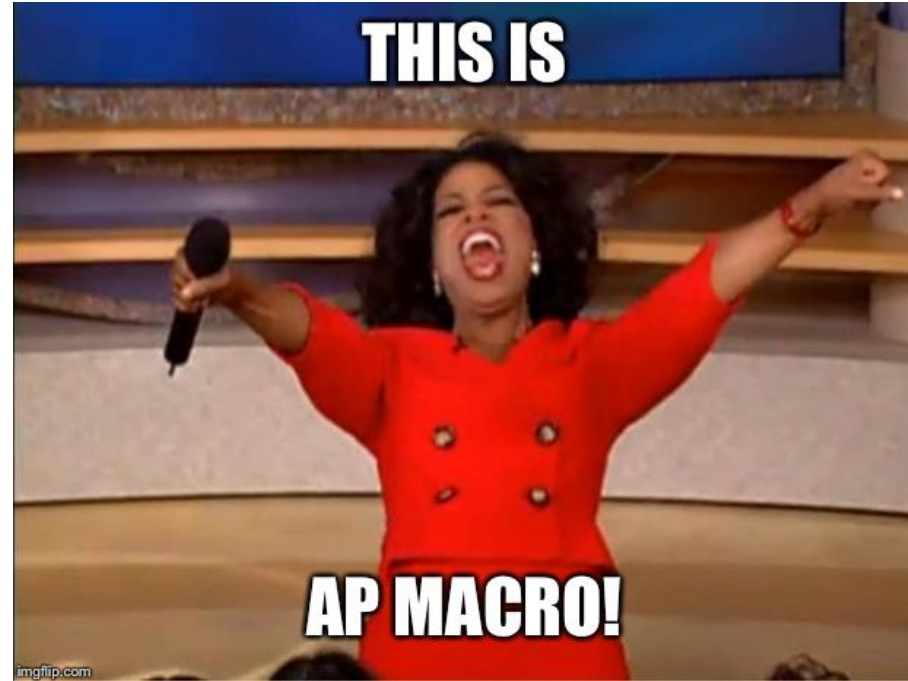


Quantity of loans falls

-Demand will decrease as worried consumers and businesses borrow/invest less
-Supply will decrease as worried foreigners take money out of the country
(This is called “capital flight”)

You can contribute! Friday, March 15 + Monday, March 18

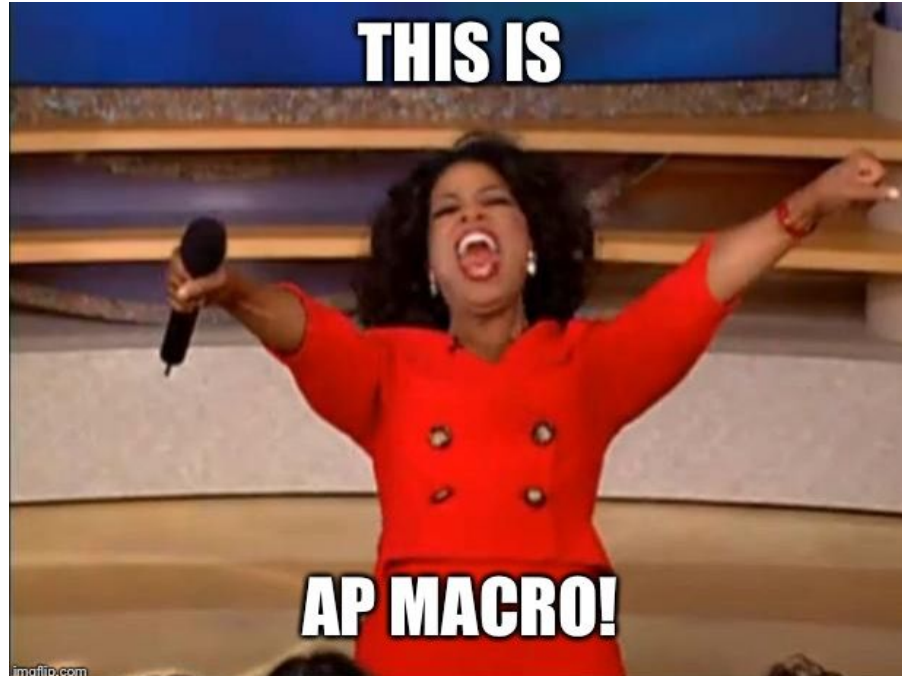
- Warm up: Come up with two questions you want to ask from your study guide.
- Agenda:
 - Fun set: finish, trade/grade
 - Quiz
 - Kahoot!
 - Study guide



Tutoring

I will be here after school on Monday and Tuesday!

Are you ready for your second FUN set this week? Who knew AP macro could be so awesome? Oprah did . .



Let's Compare and Contrast the Money Market and Loanable Funds Graphs

1. Why is the supply of money vertical?
2. What shifts the supply of money?
3. Why is the supply of loanable funds upward sloping?
4. What shifts the supply of loanable funds?
5. Why is the demand of money downward sloping?
6. What shifts the demand of money?
7. Why is the demand of loanable funds downward sloping?
8. What shifts the demand of loanable funds?
9. What kind of interest rate is on the money market graph?
10. What kind of interest rate is on the loanable funds graph?

14. Crowding out refers to the decrease in

- (A) national output caused by higher taxes
- (B) domestic production caused by increased imports
- (C) private investment due to increased borrowing by the government
- (D) employment caused by higher inflation
- (E) exports caused by an appreciating currency of a country

50. When an economy is at full employment, which of the following will most likely create demand-pull inflation in the short run?

- (A) An increase in the discount rate
- (B) An increase in personal income taxes
- (C) A decrease in the real rate of interest
- (D) A decrease in government spending
- (E) A decrease in the money supply

38. An increase in the government budget deficit is most likely to result in an increase in which of the following?
- (A) The marginal propensity to consume
 - (B) Exports
 - (C) The real interest rate
 - (D) The money supply
 - (E) The simple multiplier

Suppose that a national government increased deficit spending on goods and services, increasing its demand for loanable funds. In the long run, this policy would most likely result in which of the following changes in this country?

- | | <u>Real Interest Rate</u> | <u>Investment</u> |
|-----|---------------------------|-------------------|
| (A) | Decrease | Decrease |
| (B) | Decrease | Increase |
| (C) | Increase | Decrease |
| (D) | Increase | No change |
| (E) | No change | Increase |

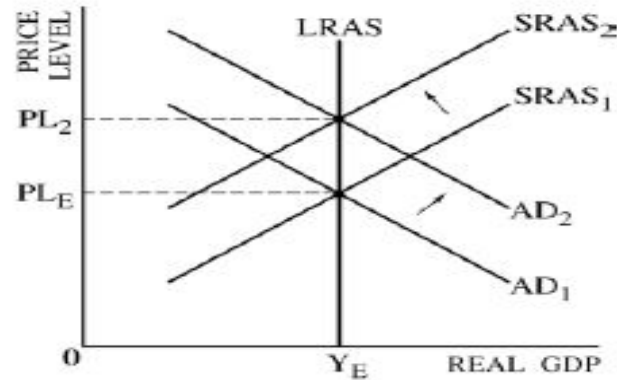
2010 FRO #1

1. Assume that the United States economy is currently in long-run equilibrium.
 - (a) Draw a correctly labeled graph of aggregate demand and aggregate supply and show each of the following.
 - (i) The long-run aggregate supply curve
 - (ii) The current equilibrium output and price levels, labeled as Y_E and PL_E , respectively
 - (b) Assume that the government increases spending on national defense without raising taxes.
 - (i) On your graph in part (a), show how the government action affects aggregate demand.
 - (ii) How will this government action affect the unemployment rate in the short run? Explain.
 - (c) Assume that the economy adjusts to a new long-run equilibrium after the increase in government spending.
 - (i) How will the short-run aggregate supply curve in the new long-run equilibrium compare with that in the initial long-run equilibrium in part (a) ? Explain.
 - (ii) On your graph in part (a), label the new long-run equilibrium price level as PL_2 .
 - (d) In order to finance the increase in government spending on national defense from part (b), the government borrows funds from the public. Using a correctly labeled graph of the loanable funds market, show the effect of the government's borrowing on the real interest rate.
 - (e) Given the change in the real interest rate in part (d), what is the impact on each of the following?
 - (i) Investment
 - (ii) Economic growth rate. Explain.

Question 1

2010 FRQ #1

10 Points (2 + 2 + 2 + 2 + 2)



(a) 2 points:

- One point is earned for a correctly labeled graph with a downward-sloping AD curve, an upward-sloping SRAS curve, and the points PL_E and Y_E on the vertical and horizontal axes.
- One point is earned for showing a vertical LRAS curve at Y_E .

(b) 2 points:

- One point is earned for showing a rightward shift of the AD curve on the graph in part (a).
- One point is earned for stating that the unemployment rate would fall and explaining that this is because real output increases.

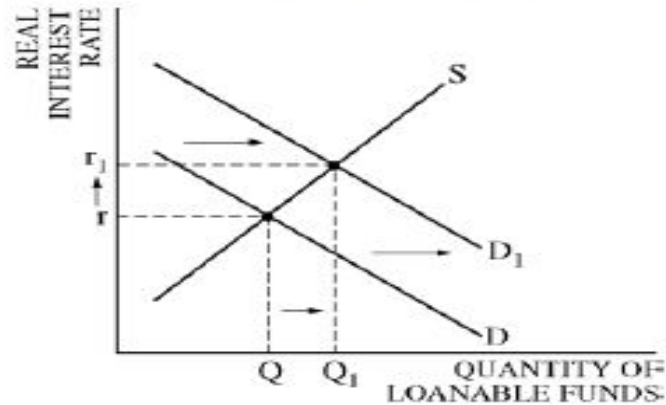
(c) 2 points:

- One point is earned for stating that the short-run aggregate supply curve will shift to the left and showing PL_2 correctly on the graph in part (a).
- One point is earned for explaining that the actual price level is higher than was expected or that wages and commodity prices adjust to the higher price level, causing the SRAS curve to shift to the left.



2010 ERQ #1

Question 1 (continued)



(d) 2 points:

- One point is earned for a correctly labeled graph of the loanable funds market.
- One point is earned for showing a rightward shift of the demand curve, resulting in a higher interest rate OR a leftward shift of the supply curve, resulting in a higher interest rate.

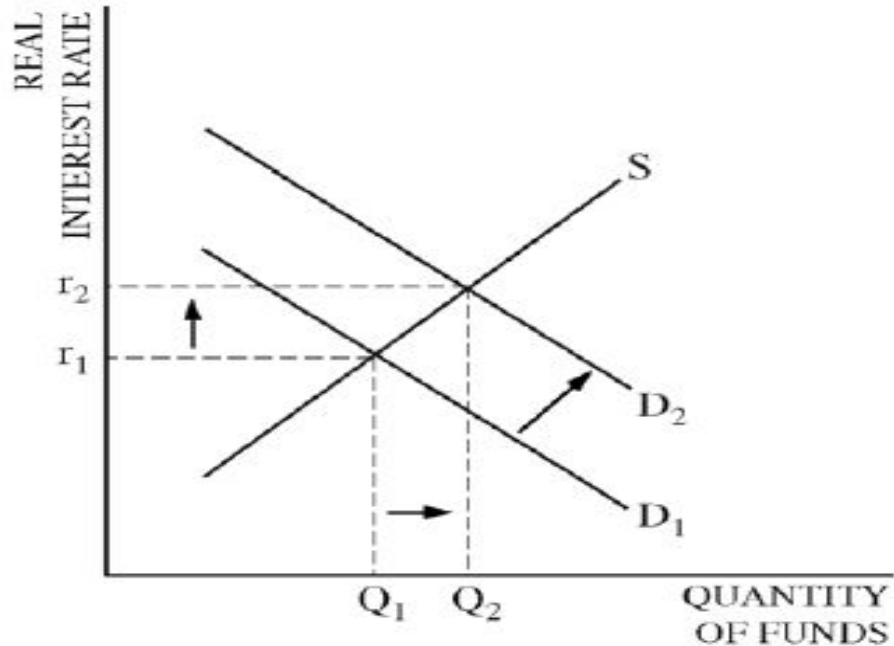
(e) 2 points:

- One point is earned for stating that investment spending will decrease.
- One point is earned for explaining that the decrease in investment slows down capital formation, leading to a reduction in the economic growth rate.

2007B Practice FRQ

2. (a) Assume that businesses are granted a tax credit on spending for machinery. Using a correctly labeled graph of the loanable funds market, show the effect of the business sector's response on the real interest rate.
- (b) Now assume instead that the tax rate on interest income from household savings is lowered and there is no change in government budget deficit. Using a second correctly labeled graph of the loanable funds market, show the effect of the households' response on the real interest rate.
- (c) Given your answer to part (b), explain what will happen to the country's production possibilities curve in the long run.

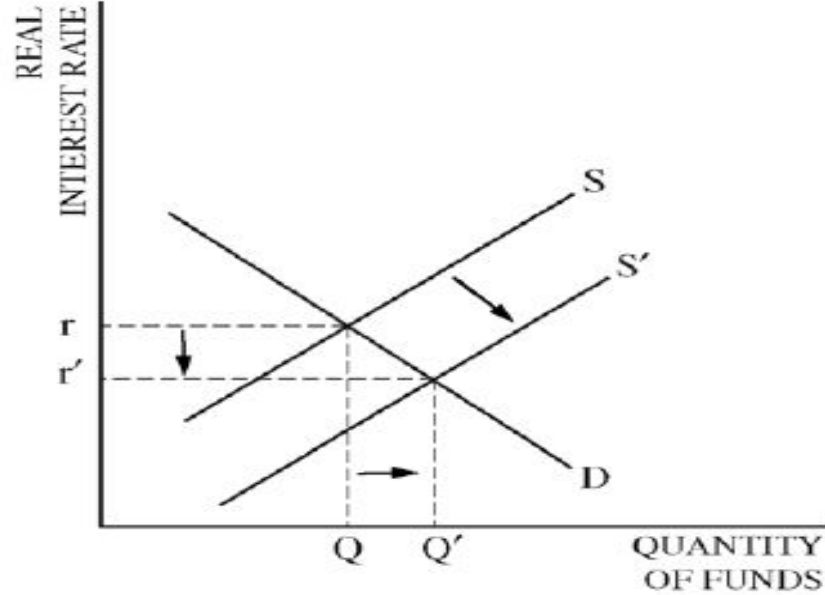
2007B Practice FRQ



(a) 3 points:

- One point is earned for a correctly labeled graph of the loanable funds market.
- One point is earned for shifting the demand for funds curve to the right.
- One point is earned for concluding that the real interest rate rises.

2007B Practice FRQ



(b) 2 points:

- One point is earned for shifting the supply of funds curve to the right.
- One point is earned for concluding that the real interest rate falls.

(c) 2 points:

- One point is earned for stating that the production possibilities curve (PPC) will shift to the right.
- One point is earned for the explanation that the country's capital stock increases.

2009 Practice FRQ

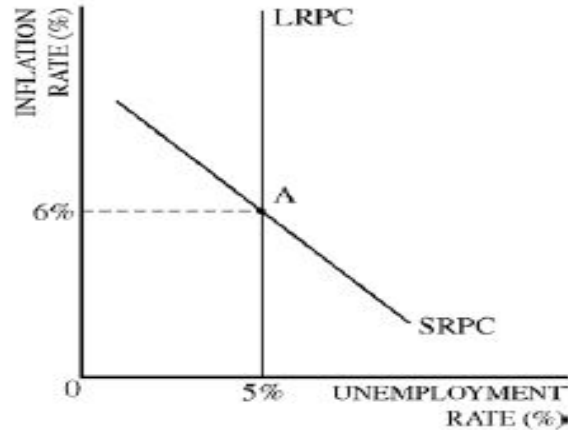
1. Assume that the United States economy is in long-run equilibrium with an expected inflation rate of 6 percent and an unemployment rate of 5 percent. The nominal interest rate is 8 percent.
 - (a) Using a correctly labeled graph with both the short-run and long-run Phillips curves and the relevant numbers from above, show the current long-run equilibrium as point A.
 - (b) Calculate the real interest rate in the long-run equilibrium.
 - (c) Assume now that the Federal Reserve decides to target an inflation rate of 3 percent. What open-market operation should the Federal Reserve undertake?
 - (d) Using a correctly labeled graph of the money market, show how the Federal Reserve's action you identified in part (c) will affect the nominal interest rate.
 - (e) How will the interest rate change you identified in part (d) affect aggregate demand in the short run? Explain.
 - (f) Assume that the Federal Reserve action is successful. What will happen to each of the following as the economy approaches a new long-run equilibrium?
 - (i) The short-run Phillips curve. Explain.
 - (ii) The natural rate of unemployment



2009 Practice FRQ

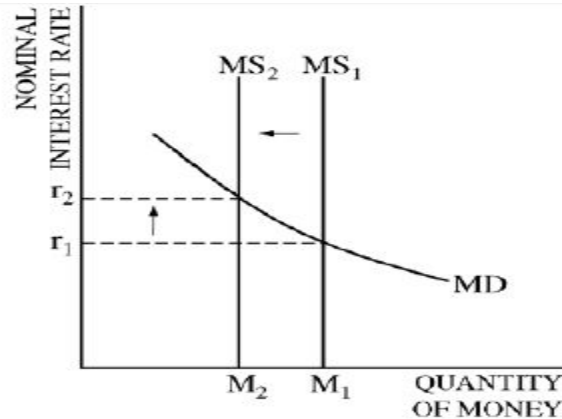
Question 1

11 Points (2 + 1 + 1 + 2 + 2 + 3)



- (a) 2 points:
- One point is earned for a correctly labeled graph of the short-run Phillips curve.
 - One point is earned for showing position "A" on the LRPC at the correct coordinates where the SRPC crosses the LRPC curve.
- (b) 1 point:
- One point is earned for the correct calculation of the real interest rate: $8\% - 6\% = 2\%$.
- (c) 1 point:
- One point is earned for stating that the Federal Reserve should sell bonds.

2009 Practice FRQ



(d) 2 points:

- One point is earned for a correctly labeled graph of the money market.
- One point is earned for showing a leftward shift of the money supply curve resulting in a higher interest rate.

(e) 2 points:

- One point is earned for stating that aggregate demand decreases.
- One point is earned for explaining that the higher interest rate decreases investment and interest-sensitive consumption spending, and that both consumption and investment are components of aggregate demand.

(f) 3 points:

- One point is earned for stating that the short-run Phillips curve will shift to the left.
- One point is earned for explaining that Federal Reserve policy will lower inflationary expectations.
- One point is earned for stating that the natural rate of unemployment will remain unchanged.

2012 Audit Exam

BANK A

<u>Assets</u>		<u>Liabilities</u>	
Actual reserves	\$1,000	Demand deposits	\$5,000
Loans	\$4,000		

BANK B

<u>Assets</u>		<u>Liabilities</u>	
Actual reserves	\$ 100	Demand deposits	\$ 600
Loans	\$ 500		

BANK C

<u>Assets</u>		<u>Liabilities</u>	
Actual reserves	\$ 10	Demand deposits	\$ 100
Loans	\$ 90		

Based on the balance sheets above for three different banks, which of the following is true, if the reserve requirement is 10 percent?

- (A) Bank A has no excess reserves.
- (B) Bank B has no excess reserves.
- (C) Bank B can increase its loans by \$500.
- (D) Bank B can increase its loans by \$40.**
- (E) Bank C has excess reserves.