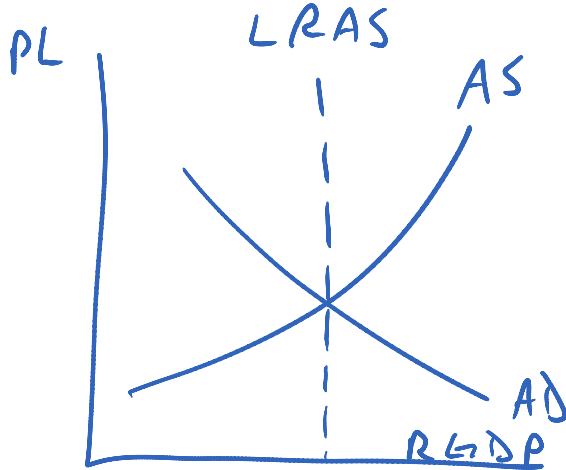


## All the graphs and formulas you need for AP Macroeconomics

### Aggregate Demand/Aggregate Supply with Long Run Aggregate Supply



PL is price level, a representation of the inflation rate.

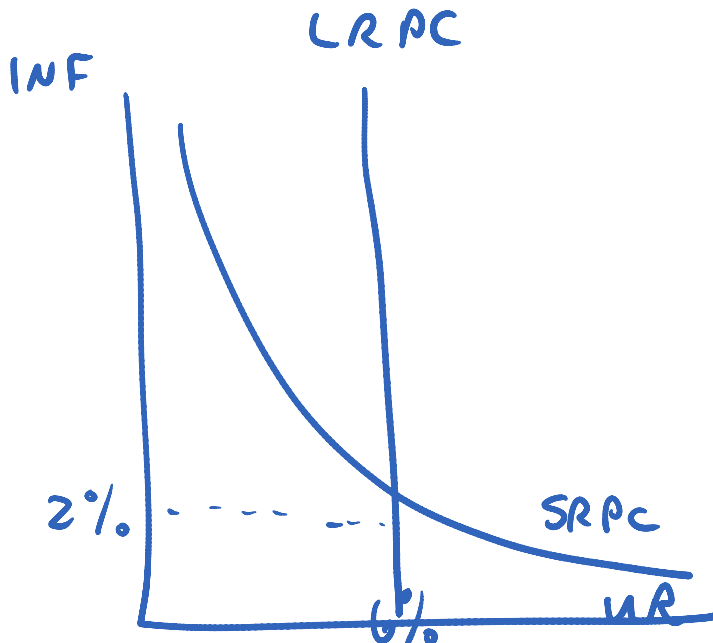
LRAS is the long run aggregate supply curve, a representation of the economy's full employment output.

AS is the short run aggregate supply curve, representing the short term production. This curve is affected by resource cost, actions of the government and productivity. Bottom line: things that are good for business will shift AS to right, bad things shift it left.

AD is the aggregate demand curve, a representation of what Consumers, Businesses, the Government and foreigners are demanding (CigGXn). These factors will shift the curve left and right by decreasing and increasing.

RGDP is real gross domestic product, the amount of output that is being produced and demanded. It is synonymous with income (Y) and employment.

### Short run and long run Phillips Curve



The Short run Phillips curve represents the trade off between inflation and unemployment in the short run.

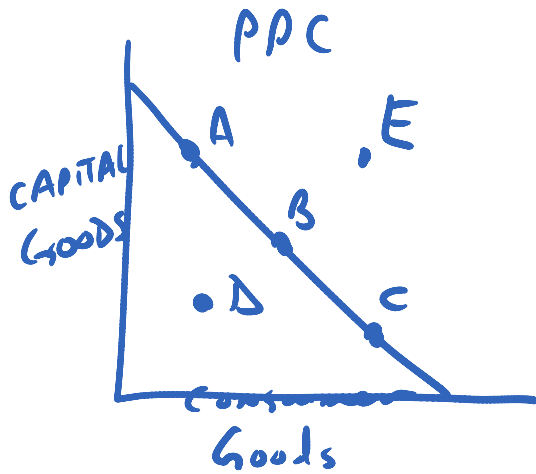
The long run Phillips curve shows no relationship between unemployment and inflation. In the long run the economy always moves to full employment.

You should always draw this curve with the AD/AS curve next to it so that you can use the 'mirror image' that the AS curve represents to the Phillips Curve.

That means that whatever shifts the AS curve will shift the PC curve the opposite direction. Also, when the AD curve shifts, it creates a new AQS which also means a new point on the SRPC.

What will shift the PPC will shift the LRAS will shift the LRPC.

## Production Possibilities Curves



PPC represents several economic concepts.

The PPC shows the trade-off that exists when production choices are made.

Scarcity: is represented by the frontier line that shows that a limited quantity of goods and/or services can be produced with limited resources.

Opportunity cost is represented by the different points along the curve. Moving from point to another requires that you give up some of one good in order to have more of another.

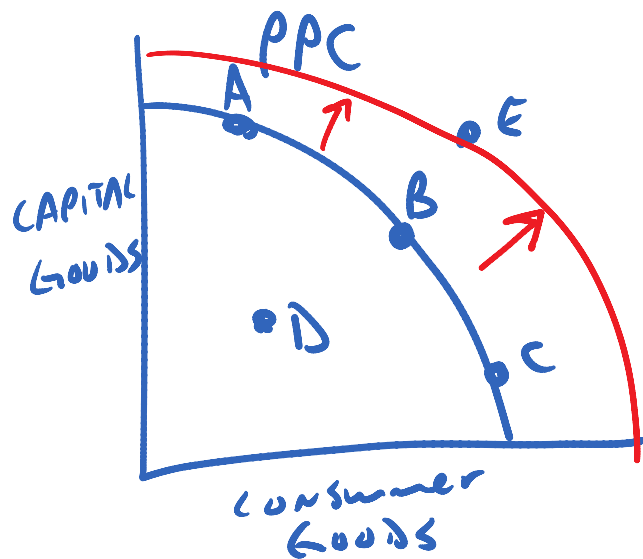
Unemployment is represented by points within the curve.

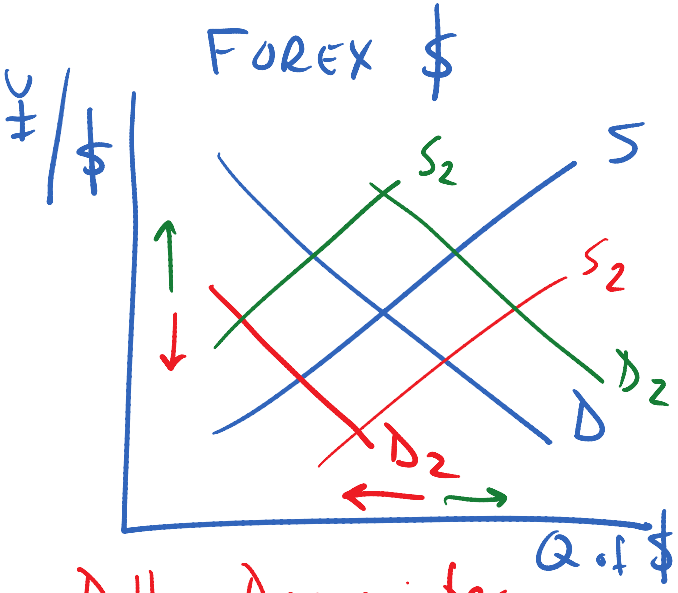
Points outside the curve are unattainable without new resources or technology.

Economic growth is represented by an outward shift of the curve.

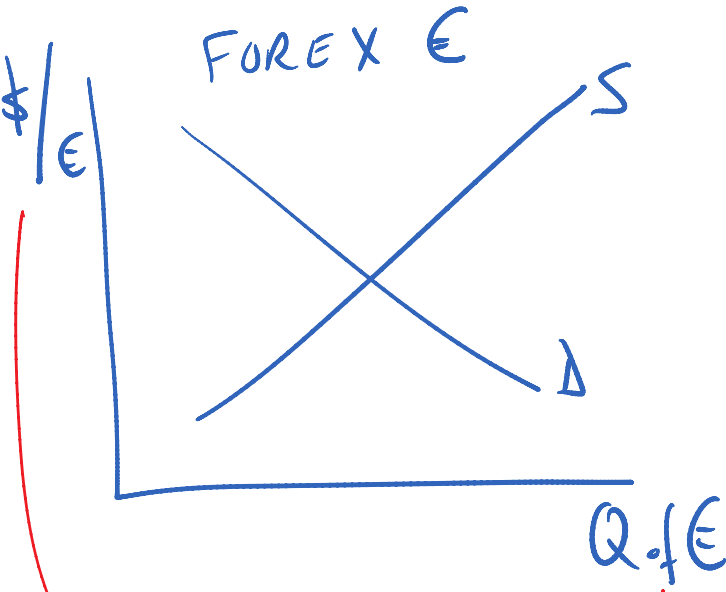
The straight line, constant slope, illustrates constant costs.

The curved line, convex, illustrates increasing costs.





Dollar Depreciates  
Dollar Appreciates



Dollar price of €  
Quantity of Euros

Foreign Exchange Markets for Currency:

The FOREX graph illustrates the changes in values of currencies that result from shifts in Supply or Demand for the currencies.

The demand for a currency fluctuates based on factors including the nation's price level, interest rates, and income.

If a nation's price level increases relative to another nation's then that nation's goods will be in less demand (nobody wants to pay higher prices). If the nation's goods are in less demand, so will their currency be.

If a nation's interest rates are higher relative to another, then that nation's currency will be in higher demand for financial investors interested in placing financial assets in banks earning higher interest.

If a nation's income is higher than other nation's, then that nation's citizens will be purchasing more of other nation's goods which would increase the demand for the lower income nation's currency and increase supply of the higher income nation's currency.

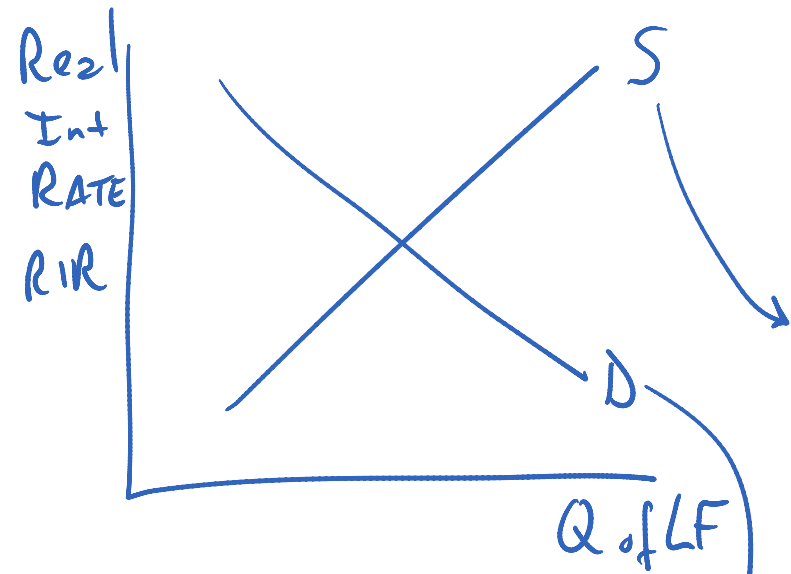
When a currency costs more (either decrease in supply or increase in demand), it's exports will decrease because they have become relatively more expensive. The currency has appreciated.

When a currency costs less, depreciates (either increase in supply or decrease in demand) it's exports will increase because they become relatively less expensive.

When the demand of one currency increases, the supply of the other currency also increases.

In answering questions regarding FOREX and exports, always take things one step at a time. For example, if a nation's price level is higher, then people will not be buying its exports and its currency will be in lower demand. Then, the depreciated currency will cause their exports to become less expensive and their exports will increase. It's like a pendulum swinging back and forth. Always answer questions based on the immediate effects.

# LFM

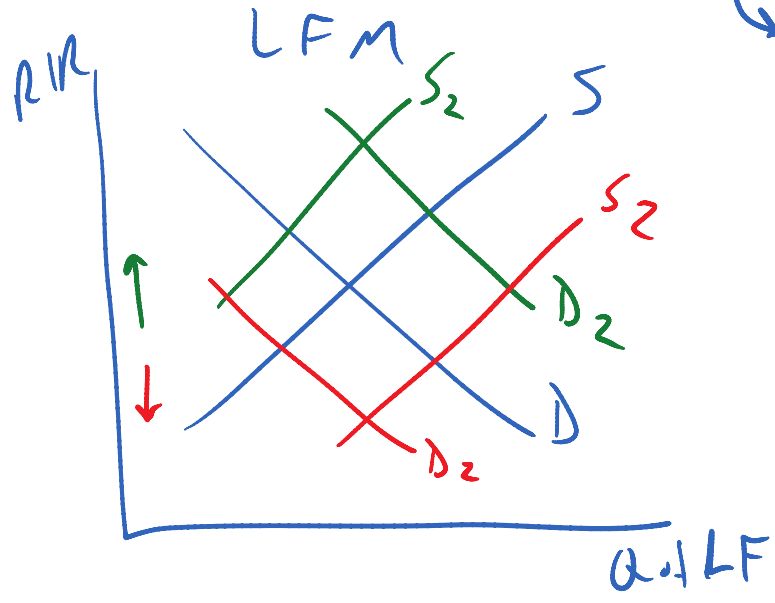


## Loanable Funds Market:

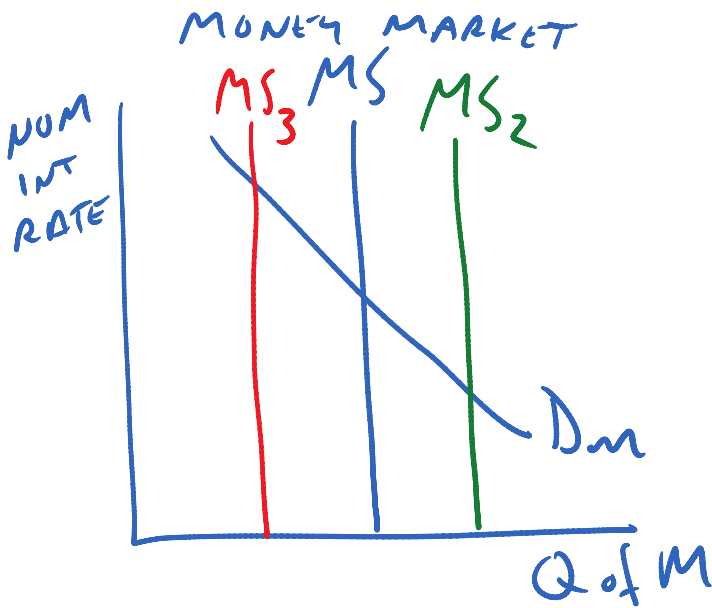
The loanable funds market is the market where funds are obtained for borrowing (demand for LF) or where funds are placed for saving (supply of LF). Think of the LFM as a bank where people visit for two reasons: to borrow money and to save money. The price paid for loanable funds is the 'real interest rate' (nominal rate minus inflation)

The supply of loanable funds is made up of people, businesses, and foreigners that all have money in the bank earning interest. If savings increases then the S of LF will increase (shifts right). If savings decreases, then the S of LF will shift left. Note the changes that occur in the real interest rate.

The demand for loanable funds is made up of people, businesses, foreigners and the government who want to borrow money. If borrowing is increased, then the demand for LF will shift to the right. If borrowing is decreased, then the demand for LF will shift left. Note the change in the 'real interest rate'.

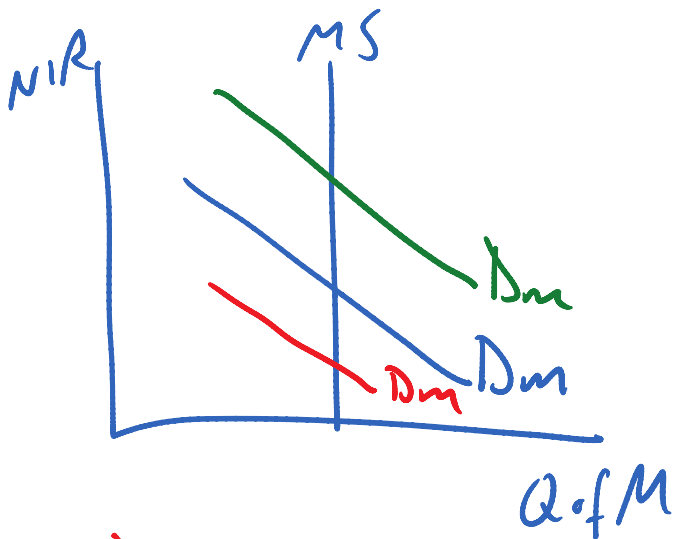


This is the graph that you will need to draw when discussing real interest rates. Real interest rates, and nominal interest rates, are important in consumption and gross investment decisions. Higher rates of interest will reduce both. Lower rates of interest will increase both. Reminder: there are two types of investment, real and financial. When discussing AD, LFM, etc. we are looking at real investment, which is the purchase of factories, tools and machinery for business.



$MS \uparrow \rightarrow \downarrow NIR$

$MS \downarrow \rightarrow \uparrow NIR$



$\downarrow Dm \rightarrow \downarrow NIR$

$\uparrow Dm \rightarrow \uparrow NIR$

### Money Market Graph:

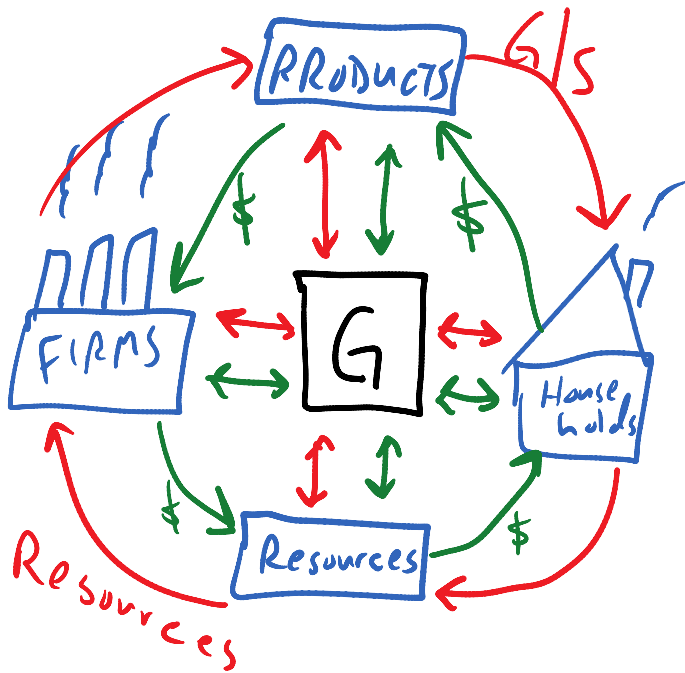
The money market is different from loanable funds and from currency markets. Money Market is the supply and demand for money to make daily transactions and to hold as an asset. The price for money is the Nominal Interest Rate. We use nominal interest because the money supply helps determine inflation, so we will use the interest rate that contains inflation.

The supply of money is determined by the FED (federal reserve board of governors) primarily through open-market operations or the buying and selling of bonds/securities. Other FED tools include the discount rate and the reserve requirement. These tools influence how banks make loans and the money supply increases through the loan process and decreases when loans are not made. The MS curve is always vertical.

The demand for money is made up of two things: transaction demand and asset demand. These will be the shifters for the demand curve. So, if the price level increases, people will demand more money to make daily and monthly transactions. If the price level falls, we need less money. Asset demand could change anytime people either liquidate assets (turning assets into cash requires an increased demand for money) or buy assets.

The intersection of MS and DM determine the nominal interest rate. Now, even though we are only looking at the nominal interest rate change, anytime nominal rates go down, real interest will also fall.

Again, interest rates, whether nominal or real, affect consumption and investment, the FOREX and therefore exports.



### Circular Flow:

The circular flow model is not necessarily a macro graph, but understanding the flow is important in understanding other macro concepts.

For example, the flow of money goes from households to firms and from firms to households. This flow enables households to make purchases of goods and services and allows firms to buy resources. Everything is interconnected.

Resources flow from households (land, labor, capital and entrepreneurs) to businesses. Businesses turn those resources into goods and services.

The government is both a supplier and demander of resources and goods and services.

Anytime a flow is interrupted, economic activity slows.

PAYMENT FOR G/S

PAYMENT FOR RESOURCES  
(RENT, WAGES, INT, PROFITS)

## Macro Formulas

Spending and Tax Multipliers:

$$1/\text{MPS} = \text{Expenditure Multiplier}$$

Any spending in the economy will increase GDP by more than that initial round of spending. It will increase GDP by some multiple of the spending. For example, if the Me is 5 and \$100 is spent, GDP will increase by \$500.

Marginal Propensity to Consume:

The percentage of new income that is spent.

$$\text{MPC} = \text{Change in C} / \text{Change in Y}$$

Marginal Propensity to Save:

The percentage of new income that is saved.

$$\text{MPC} = \text{Change in S} / \text{Change in Y}$$

Unemployment Rate:

The percentage of the labor force that is without a job and looking.

$$\text{UR} = (\# \text{ unemployed} / \# \text{ in LF}) \times 100$$

Inflation Rate:

The percentage change in price level from one year to another.

$$\text{Inflation Rate} = (\text{CY Price Index} - \text{PY Price Index} / \text{PY Price Index}) \times 100$$

You can also figure the percentage change in market basket from one year to another.

Market Basket:

The value of a set quantity of goods and services typically purchased by a nation's consumers.

$$\text{Market Basket} = \text{Price} \times \text{Quantity}$$

Price Index:

The price index is a measure of inflation that uses the market basket fluctuations to create a number based on 100. 100 being the base year price index. The price index can also be called a GDP deflator.

$$\text{Price Index} = (\text{CY Market Basket} / \text{Base Year Market Basket}) \times 100$$

Real GDP:

Real GDP is a measure of production that removes inflation.

$$\text{RGDP} = (\text{Nominal GDP} / \text{Price Index}) \times 100$$

Money Deposit Multiplier:

Banks create money by making loans of excess reserves. How much money can be created depends on the reserve ratio that banks must follow. Banks keep a percentage of deposits as required reserves that cannot be loaned out. What is left over is called excess reserves, which can be loaned out. If all the banks in the banking system loan out all of their reserves and if all the loans get deposited into other banks, there is a maximum amount by which the MS can change.

$$\text{Total Reserves} = \text{Excess Reserves} + \text{Required Reserves}$$

$$\text{Money Multiplier} = 1 / \text{decimal form of the \% RR}$$

$$\text{Potential Money Creation} = \text{MM} \times \text{ER}$$

$$\text{Total Money Supply} = \text{DD} \times \text{MM} \quad \text{Or: } \text{TMS} = \text{PMC} + \text{DD}$$



Directions: Click the link and review the tutorial. After each tutorial, write down the key take away that you gained from the tutorial and draw the appropriate graph if applicable. The boxes in the chart will expand as you type. If you can't draw graphs on your computer, print it out and draw your graphs on paper.

I am confident that this level of preparation will maximize your potential score.

**Day 1 AP Macro Review—Basics and Foreign Trade**

Concepts	Link	Key Take Away	Graph
Four Resources	<a href="http://www.reffonomics.com/TRB/chapter1/resources.swf">http://www.reffonomics.com/TRB/chapter1/resources.swf</a>		
Circular Flow	<a href="http://www.reffonomics.com/TRB/Chapter3/circularflow7.swf">http://www.reffonomics.com/TRB/Chapter3/circularflow7.swf</a>		
PPC	<a href="http://www.reffonomics.com/TRB/chapter1/ppcurve19.swf">http://www.reffonomics.com/TRB/chapter1/ppcurve19.swf</a>		
Global Trade	<a href="http://www.reffonomics.com/TRB/chapter1/ppcurve1.swf">http://www.reffonomics.com/TRB/chapter1/ppcurve1.swf</a>		
Global Trade 2	<a href="http://www.reffonomics.com/TRB/chapter1/ppcurve2.swf">http://www.reffonomics.com/TRB/chapter1/ppcurve2.swf</a>		
Global Trade 3	<a href="http://www.reffonomics.com/TRB/chapter1/ppcurve3.swf">http://www.reffonomics.com/TRB/chapter1/ppcurve3.swf</a>		
Balance of Payments	<a href="http://www.reffonomics.com/textbook2/macroec">http://www.reffonomics.com/textbook2/macroec</a>		

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Currency Exchange	<a href="http://www.reffonomics.com/textbook2/macroeconomics2/foreignexchange/market/exchangerates.swf">http://ww w.reffono mics.com/ textbook2 /macroec onomics2/ foreignexc hangemar ket/excha ngerates.s wf</a>		
<b>Day 2 AP Macro Review—Economic Measurement</b>			
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Unemployment	<a href="http://www.reffonomics.com/TRB/chapter20/unemployment3.swf">http://ww w.reffono mics.com/ TRB/chapt er20/une mploymen t3.swf</a>		
Inflation 1	<a href="http://www.reffonomics.com/TRB/chapter20/inflationembedded.swf">http://ww w.reffono mics.com/ TRB/chapt er20/inflat ionembed ded.swf</a>		

Inflation 2	<a href="http://www.reffonomics.com/TRB/chapter20/inflationdemandpullsupplypush.html">http://www.reffonomics.com/TRB/chapter20/inflationdemandpullsupplypush.html</a>		
Inflation Calculations	<a href="http://www.reffonomics.com/TRB/chapter20/inflationcalculator.html">http://www.reffonomics.com/TRB/chapter20/inflationcalculator.html</a>		
Consumer Price Index	<a href="http://www.reffonomics.com/TRB/chapter20/inflationCPI.swf">http://www.reffonomics.com/TRB/chapter20/inflationCPI.swf</a>		
Aggregate Demand	<a href="http://www.reffonomics.com/textbook2/macroeconomics2/aggregate-demand/agggregatedemand.swf">http://www.reffonomics.com/textbook2/macroeconomics2/aggregate-demand/agggregatedemand.swf</a>		
Aggregate Supply	<a href="http://www.reffonomics.com/textbook2/macroeconomics2/aggregate-supply/agggregatesupplyrange.swf">http://www.reffonomics.com/textbook2/macroeconomics2/aggregate-supply/agggregatesupplyrange.swf</a>		
AD/AS Models	<a href="http://www.reffonomics.com/TRB/chapter24/aggregatesupplykeynesia">http://www.reffonomics.com/TRB/chapter24/aggregatesupplykeynesia</a>		

	<a href="#">nclassical2.swf</a>		
<b>Day 3 AP Macro Reviews—Stabilization Policies</b>			
Spending and Tax Multipliers	<a href="http://www.reffonomics.com/textbook2/macroeconomics2/keynesianthought/keynesianformulas.swf">http://www.reffonomics.com/textbook2/macroeconomics2/keynesianthought/keynesianformulas.swf</a>		
Fiscal Policy: G or T?	<a href="http://www.reffonomics.com/textbook2/macroeconomics2/monetaryandfiscalpolicy/governmentspendingvsincreasetaxes.swf">http://www.reffonomics.com/textbook2/macroeconomics2/monetaryandfiscalpolicy/governmentspendingvsincreasetaxes.swf</a>		
Crowding Out Effect	<a href="http://www.reffonomics.com/textbook2/macroeconomics2/introtomacro/crowdingout.swf">http://www.reffonomics.com/textbook2/macroeconomics2/introtomacro/crowdingout.swf</a>		
Measures of Money	<a href="http://www.reffonomics.com/textbook2/macroeconomics2/money/moneystockmoneysupply.swf">http://www.reffonomics.com/textbook2/macroeconomics2/money/moneystockmoneysupply.swf</a>		
Money Creation: Pine Gulch	<a href="http://www.reffonomics.com/recollection">http://www.reffonomics.com/recollection</a>		

	<a href="http://www.reffonomics.com/textbook2/macroeconomics2/taccountofbankandfederalreserve/balancesheet.swf">nsopinegulch10.swf</a>		
T-Accounts	<a href="http://www.reffonomics.com/textbook2/macroeconomics2/taccountofbankandfederalreserve/balancesheet.swf">http://www.reffonomics.com/textbook2/macroeconomics2/taccountofbankandfederalreserve/balancesheet.swf</a>		
Bond Prices and Interest Rates	<a href="http://www.reffonomics.com/textbook2/macroeconomics2/taccountofbankandfederalreserve/bonds.swf">http://www.reffonomics.com/textbook2/macroeconomics2/taccountofbankandfederalreserve/bonds.swf</a>		
Money Market vs. Loanable Funds Market	<a href="http://www.reffonomics.com/textbook2/macroeconomics2/monetaryandfiscalpolicy/monetarymarketloanablefunds.swf">http://www.reffonomics.com/textbook2/macroeconomics2/monetaryandfiscalpolicy/monetarymarketloanablefunds.swf</a>		
AD/AS Interactive	<a href="http://www.reffonomics.com/TRB/chapter23/ASADMoneyMarketLoanableFundsInteractiveGraphFillinTheBlanks.swf">http://www.reffonomics.com/TRB/chapter23/ASADMoneyMarketLoanableFundsInteractiveGraphFillinTheBlanks.swf</a>		
Phillips Curve	<a href="http://www.reffonomics.com/TRB/chapter23/PhillipsCurve.swf">http://www.reffonomics.com/TRB/chapter23/PhillipsCurve.swf</a>		

	<a href="http://mics.com/TRB/chapter29/PhillipsCurveIndexLesson3.swf">mics.com/TRB/chapter29/PhillipsCurveIndexLesson3.swf</a>		
<b>Day 4 AP Macro Review – Mock Exam Key Graphs</b>			
Basic Macro Graphs	<a href="http://www.reffonometrics.com/TRB/chapter30/Macro10.swf">http://www.reffonometrics.com/TRB/chapter30/Macro10.swf</a>		
Money Market	<a href="http://www.reffonometrics.com/TRB/chapter30/moneymarketgraph12.swf">http://www.reffonometrics.com/TRB/chapter30/moneymarketgraph12.swf</a>		
Loanable Funds Market	<a href="http://www.reffonometrics.com/TRB/chapter30/loanablefundsmarket12.swf">http://www.reffonometrics.com/TRB/chapter30/loanablefundsmarket12.swf</a>		
Currency Markets	<a href="http://www.reffonometrics.com/TRB/chapter30/currencyexchangemarket12.swf">http://www.reffonometrics.com/TRB/chapter30/currencyexchangemarket12.swf</a>		
Phillips Curve	<a href="http://www.reffonometrics.com/TRB/chapter30/phillipscurve12.swf">http://www.reffonometrics.com/TRB/chapter30/phillipscurve12.swf</a>		