Economics 102
Spring 2017
Homework #5
Due May 4, 2017

Directions:
- The homework will be collected in a box **before** the lecture.
- Please place **your name**, **TA name** and **section number** on top of the homework (legibly). Make sure you write your name as it appears on your ID so that you can receive the correct grade.
- Late homework will not be accepted so make plans ahead of time.
- **Show your work**. Good luck!

Please realize that you are essentially creating "your brand" when you submit this homework. Do you want your homework to convey that you are competent, careful and professional? Or, do you want to convey the image that you are careless, sloppy, and less than professional. For the rest of your life you will be creating your brand: please think about what you are saying about yourself when you do any work for someone else!

1) Use the Keynesian Model to answer this set of questions. Suppose that in the economy we are analyzing that the consumption function is given as $C = 36 + .2(Y – T)$ and that taxes are autonomous and equal to $50 million. For this problem assume that the aggregate price level is constant and does not change with the implementation of activist policy. Suppose you know that in this economy government spending is constant (autonomous) and equal to $50 million, investment spending is constant (autonomous) and equal to $10 million, and net exports are constant (autonomous) and equal to $10 million. Assume transfers, TR, are equal to zero in this economy. In this economy assume that there is no inflation and therefore the aggregate price level is constant.

a. What is your interpretation of the slope of the consumption function?

The slope of the consumption function tells us that for every dollar increase in the level of disposable income (Y - T), 0.2 dollars goes to consumption spending, and 0.8 dollars goes to household saving.

b. Given this information, is this country operating with a trade deficit or a trade surplus? Is the government operating with a budget deficit?

Since Net Exports = NX = Exports – Imports = 10 > 0. This country is operating with a trade surplus, and there is capital outflow. Government runs a balanced budget because G = T.

c. Given this information determine the economy's equilibrium level of output. Show how you found this equilibrium level of output.

$Y = C + I + G + NX$------------------------(1)
$C = 20 + 0.2(Y - T)$-----------------------(2)

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We are going to use equation (1) and (2) to get the equilibrium level of output. Plug in C using equation (2) into (1)

$Y = 36 + 0.2(Y - 50) + I + G + NX$
$Y = 36 + 0.2(Y - 50) + 10 + 50 + 10$

$0.8Y = 36 - 10 + 70 = 96$

Then we get Ye =120.

d.   Find the private saving using the following two approaches. Method 1: use the definition of private saving, Sp=disposable income -consumption. Method 2: use the equilibrium condition from the loanable funds market.

Method 1:
Private saving is what is left from the household's disposable income after subtracting out consumption spending.

$Sp = (Y - T) - C$

Then using the consumption function to replace C:
$Sp = (Y - T) - 36 - 0.2(Y - T) = -36 + 0.8(Y - T)$

We have calculated the equilibrium level of Y from the previous question, and we know T = 50.
$Sp = -36 + 0.8(120 - 50) = -36 + 56 = 20$

Method 2: Loanable funds market

The demand curve for loanable funds market: investment and government borrowing (deficit) = $I + (G-T) = 10$

The supply curve of loanable funds market: private saving and trade deficit = $Sp + IM - X = Sp - 10$

Then when we equate the demand and supply curves in the loanable funds market we have:
$10 = Sp - 10$

$Sp = 20$

e.   What is the definition of national savings? At this equilibrium level of output, does national savings equal the level of private saving?

National savings is the sum of private saving and government saving. We know the government is running a balanced budget (T = G), so national savings is equal to the level of private savings in this economy.

f.   Does the sum of private savings, government saving, and capital inflows equal the value of investment when this economy is in equilibrium? Show your work and explain your answer. (Hint: if this is not true, then you have made an error and you need to go back and correct your work!)

There are three sources of savings: private saving, government saving, and capital inflows. Capital inflows = -10 because the country is operating with a trade surplus.

The level of total saving when this economy is in equilibrium is equal to 20 + 0 – 10 = 10, and that equals the level of private investment.

2)   Suppose you are using a Keynesian Model to analyze an economy and you are given the following information:

Autonomous Taxes = T= $100 million

Government spending = G = $80 million

Net Exports = NX = (X – IM) = $30 million

Autonomous Investment = I = $200 million

Aggregate Price Level is fixed and constant: there is no inflation in this economy

At the same time, you are given a report of consumer behavior with a quote, "*For every dollar of tax refunds, households spend 40 cents on consumption goods*".

a.   Fill in the cells in the below table. Write an equation for the consumption function in this economy based on the work you have done and the information you have been given.

C	Y
30	100
	200
	300
	400
	500

Answer

C	Y
30	100
70	200
110	300

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150	400
190	500

From the quote, we know the marginal propensity to consume is 0.4. $C = a + 0.4(Y - T)$. Then using the information from the table, $a = 30$.

The consumption function is $C = 30 + .4(Y - T)$

b.   Given the above information calculate the equilibrium level of real GDP, Y^*, for this economy. Show your work.

$Y^* = C + I + G + NX$
Replace C using the consumption function
$Y^* = 30 + 0.4(Y^* - 100) + I + G + NX$

$0.6Y^* = 30 - 40 + 200 + 80 + 30 = 300$
$Y^* = 500$

c.   Suppose the equilibrium level of real GDP you calculated in (b) is less than the full employment level of output. The government is considering two policies to increase real GDP through either (i) increasing the level of government spending by $20 million, or (ii) cutting the level of taxes by 20%. Analyze the two policies by filling in the cells of the following table. Which policy has a stronger effect on real GDP? (You should use the MPC from your work in answer (a).) Which policy has a stronger effect on the level of consumption?

Case 1. Increase government spending by $20 million.			
Round	Increase in Y	Increase in disposable income	Increase in consumption
1	$20	$20	$20* mpc
2	$20*mpc	$20*mpc	$ 20*mpc^2
3			
4			
After many rounds…..			
Total			

Case 2. Cutting taxes by 20%			
Round	Increase in Y	Increase in disposable income	Increase in consumption
1	0	$20	$20* mpc
2	$20*mpc	$20*mpc	$20*mpc^2
3			
4			
After many rounds…..			
Total			

[Note: Y = C + I + G + NX, so an increase in C leads to an increase in Y.]

Answer

Case 1. Increase government spending by $20 millions.			
Round	Increase in Y	Increase in disposable income	Increase in consumption
1	$20	$20	$20*0.4
2	$20*0.4	$20*0.4	$ 20*0.16
3	$20*0.4^2	$20*0.4^2	$20*0.4^3
4	$20*0.4^3	$20*0.4^3	$20*0.4^4
After many rounds…..			
Total	20/(1-0.4)=33.4	20/(1-0.4)=33.4	20*0.4/(1-0.4)=13.3

Case 2. Cutting taxes by 20%			
Round	Increase in Y	Increase in disposable income	Increase in consumption
1	0	$20	$20* 0.4
2	$20*0.4	$20*0.4	$20*0.16
3	$20*0.16	$20*0.16	$20*0.4^3
4	$20*0.4^3	$20*0.4^3	$20*0.4^4
After many rounds…..			

Total	$20*0.4/(1-0.4)$	$20/(1-0.4)$	$20*0.4(1-0.4)$
	$=80/6=13.3$	$=200/6=33.3$	$=13.3$

For case 1, real GDP increases by $33.4 million, and for case 2, real GDP increases by $13.3 million. Therefore, increasing government spending by $20 million is a more efficient way to increase this economy's level of real GDP. The two policies both increase consumption by $13.3 million.

3)   Use the following graph and the Keynesian Model to answer this question. Assume that the aggregate price level is fixed in this problem.
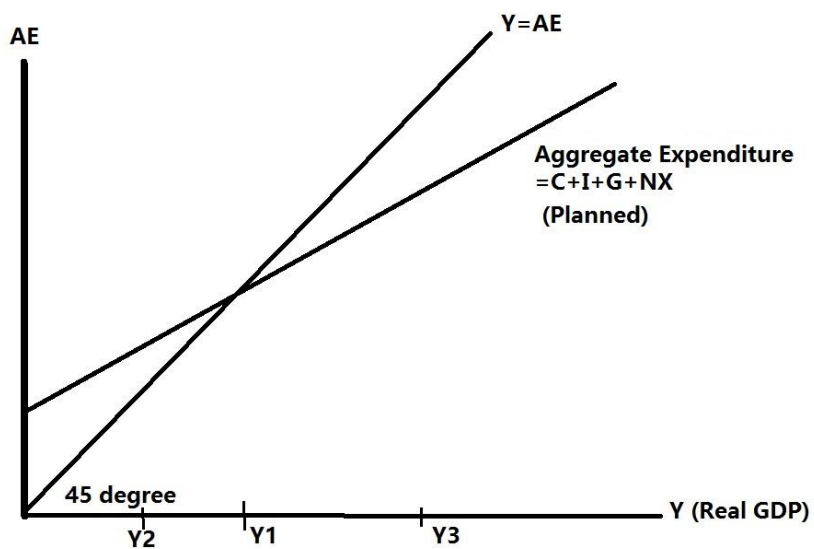
a.   Given the above graph, what is the interpretation of the slope of the planned aggregate expenditure? (Hint: the consumption function depends on the level of real GDP or Y.)

The slope of the aggregate demand curve is the MPC (marginal propensity to consume).

b.   Given the above graph, what is the equilibrium level of output (Y1, Y2 or Y3)?

The equilibrium of output is Y1.

c.   Suppose that the level of aggregate output or production is less than the level of planned aggregate expenditure. Which level of output (Y1, Y2 or Y3) in the above graph best describes this situation? How will inventories adjust for this economy to return back to the equilibrium level of real GDP?

Y2 is the best representation among the labelled points for an output where aggregate expenditure is greater than aggregate production. Because at Y2, the level of output produced is lower than the level of planned aggregate expenditure. When the level of production is below the equilibrium level of output, the change in inventories will be negative telling us that unplanned inventory reductions are occurring in this economy. This unplanned fall in inventories will act as a signal to firms to increase their level of production toward the equilibrium level of real GDP.

d.   Suppose you are told that the full employment level of production is equal to Y2. Given this information and the above graph, how would you describe the current state of this economy? In your answer make sure you describe the current state of unemployment and that you also contrast and compare the unemployment rate at Y1 and Y2.

When the full employment of output is less than the equilibrium level, then we say the economy is in a boom. The unemployment rate atY1 is smaller than the unemployment rate at Y2. When this economy operates at Y1 where Y1 is greater than Yfull employment (Y2), then we know that this economy's unemployment rate is lower than its natural rate of unemployment.

e.   Suppose you know that people in this economy decide to start saving more aggressively for each additional dollar of income that they earn (note: they will still save at a constant rate, but it would be a different constant rate). Would this change in behavior alter the equilibrium level of real GDP you found in (b)? Draw a graph that illustrates the initial situation and then the new situation given this change in saving behavior. Explain in words what you have depicted in your graph.

We are told that people are now saving more of each additional dollar of income: this implies that the MPC is decreasing from its initial level and that the MPS is increasing relative to its initial level. The change in the MPC will alter the slope of the AE curve (it will flatten) and the new equilibrium level of real GDP will be less than the initial equilibrium level of Y1.
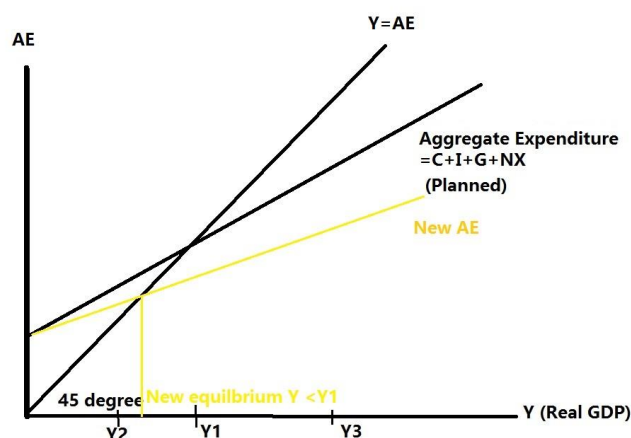
f.   Assume that the changes in (e) are still in effect in this economy. Suppose the government now decides to increase its spending and, in particular, to increase its spending on improving elderly welfare (assume that this does not change the new saving behavior).

How does this policy change affect the planned aggregate expenditure and the level of output in equilibrium relative to the equilibrium you found in (b)?
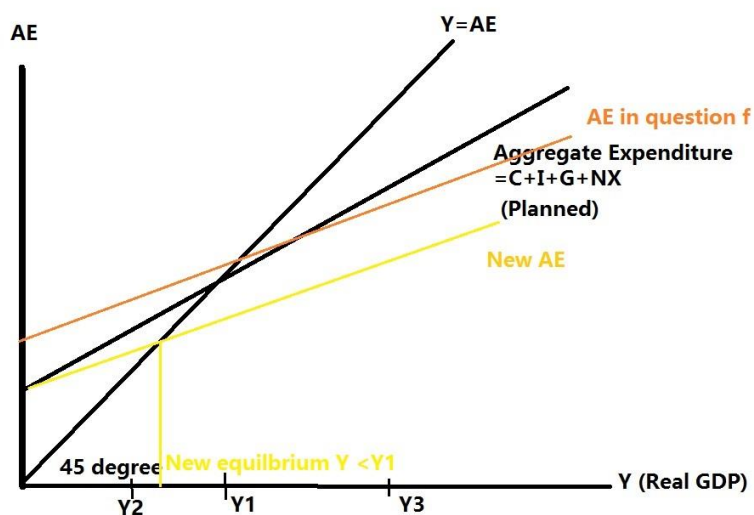
We know that the change in saving behavior alters the slope of the planned AE (see yellow line). With the change in the government spending program this will cause the planned AE line to shift up (the orange line). However we don't know whether the equilibrium level of output would be higher or lower than Y1. It depends on how much the planned AE line shifts up with the change in government spending.

4)   Use the AD/AS Model for this question. Assume that the AD/AS Model for the economy is initially in long-run equilibrium and then analyze the short-run and long-run adjustments for each of the given scenarios. **Illustrate each answer with a graph**.

a.   (2007 financial crisis)
In the credit market, a common practice is that borrowers are asked to pledge collateral in order to get loans. The more valuable the collateral is (for example, the higher the price of housing if using the house as your collateral), the more loans borrowers can obtain from banks.

You know the houses are the most popular type of collateral. Use the AD/AS model to analyze how the collapse of the housing market, with decreases in the price of housing, affected the aggregate economy.

What was the short-run and long-run impact on real GDP and the aggregate price level?

Aggregate Price Level, P   LRAS   SRAS1

SRAS2

P1

P2

P3

AD2   AD1

Y2   Yfe   Real GDP, Y
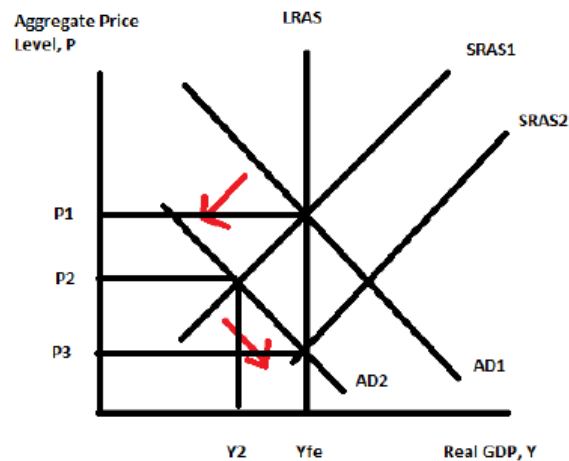
The price of houses dropped (therefore the houses as collateral are less valuable), which in turn limits the amounts of loans that will be approved. Consumption spending (C) and Investment spending (I) will both decrease because it is harder to get loans from banks in the aftermath of the falling housing prices. The AD curve shifts left in the short run from AD1 to AD2, and output declines in the short run (from Yfe to Y2). The aggregate price level changes from P1 to P2. The SRAS doesn't change because wages are sticky.

In the long run, the nominal wage falls due to unemployed labor recognizing that they must accept a lower wage in order to join the employed ranks (the labor market has a high unemployment rate at Y2). The SRAS shifts right because at cheaper nominal wages, the firms hire more units of labor to produce a higher level of output. In the long run, the equilibrium output adjusts back to the full employment level Yfe, and the aggregate price level falls even further from from P2 to P3.

b.   (1973 oil crisis)
In 1973, the members of the Organization of Arab Petroleum Exporting Countries (OPEC) proclaimed an oil embargo. Due to this embargo the price of oil rose from $3 per barrel to nearly $12 per barrel globally. Since oil is a major input used in the manufacture of other outputs, this meant that firms faced higher costs of production.

Use the AD/AS model to analyze how this embargo affected the aggregate economy in the short run as well as the long run. In your answer provide a graph and describe the short-run and long-run impact on real GDP and the aggregate price level.
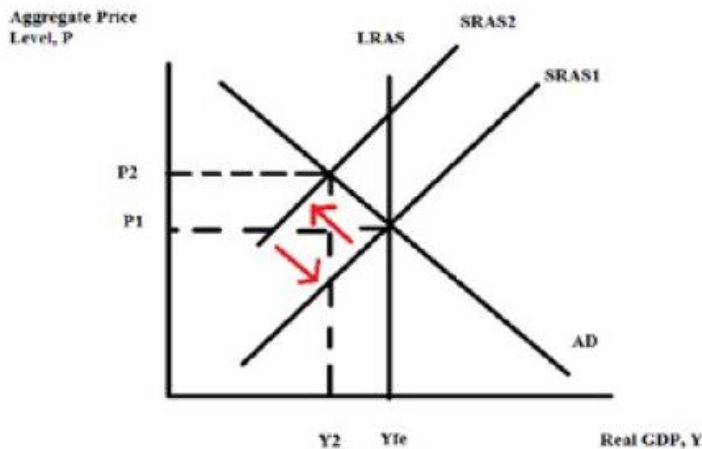
The embargo resulted in a steep rise in the price of oil in the early 1970s, and the higher costs that firms experienced because of this rise in the price of oil discouraged firms from producing as much output. In the short run the SRAS curve shifted left from SRAS1 to SRAS2 resulting in a lower level of real GDP (Y2 instead of Yfe) and a higher aggregate price level (P2 versus P1) in the short run. In the long run, unemployed workers accept lower nominal wages in order to find employment and this causes the SRAS curve to shift back to the right. The economy in the long run returns to its initial equilibrium with output at Yfe and the aggregate price level at P1.
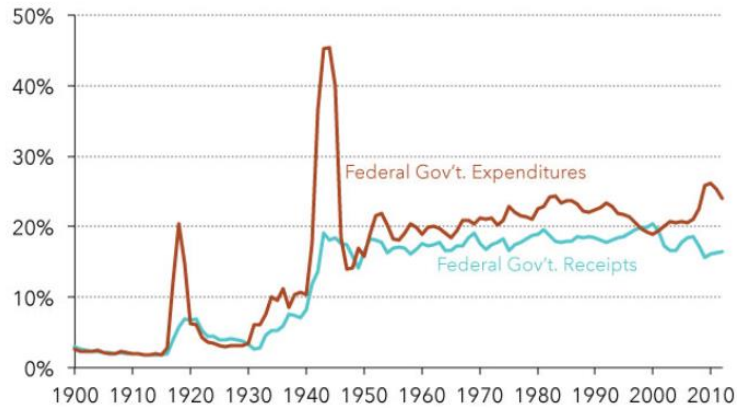
c.   (Government Spending in World War Two)

The figure below provides historical data on Federal Government Receipts (think taxes) and Federal Government Spending (think G) from 1900 to 2012. From the provided data it is easy to see that government spending skyrocketed during the World War II. Use the AD/AS model to analyze how this increase in government spending during the war period affected the aggregate economy.

What was the short-run and long-run impact on real GDP and the aggregate price level? [Note: for historical accuracy your instructor wants to assert that the economy at the beginning of WWII was not at Yfe: the economy was producing at Y<Yfe. But, in order to simplify your analysis here we will assume that the economy was at Yfe. You might want to think about doing the analysis for your own interest based on starting at a level of output where Ye<Yfe and see what happens!]

Chart 1: Federal Government Receipts and Expenditures as Percent of GDP*, 1900-2012

This figure is taken from

https://taxfoundation.org/short-history-government-taxing-and-spending-united-states/

In the short-run the AD curve will shift to the right from AD1 to AD2 and there will be a movement along the short run AS curve to Y2 and P2. In the short run, we can see that the level of real GDP increases to Y2 and the aggregate price level increases from P1 to P2. In the long run the increase in the aggregate price level leads workers to demand higher paid jobs and this causes the nominal wage to increase. Due to this increase in nominal wages the SRAS curve shifts to the left from SRAS1 to SRAS2. In the long run the economy returns to the full employment level of real GDP, Yfe, while the aggregate price level increases to P3.
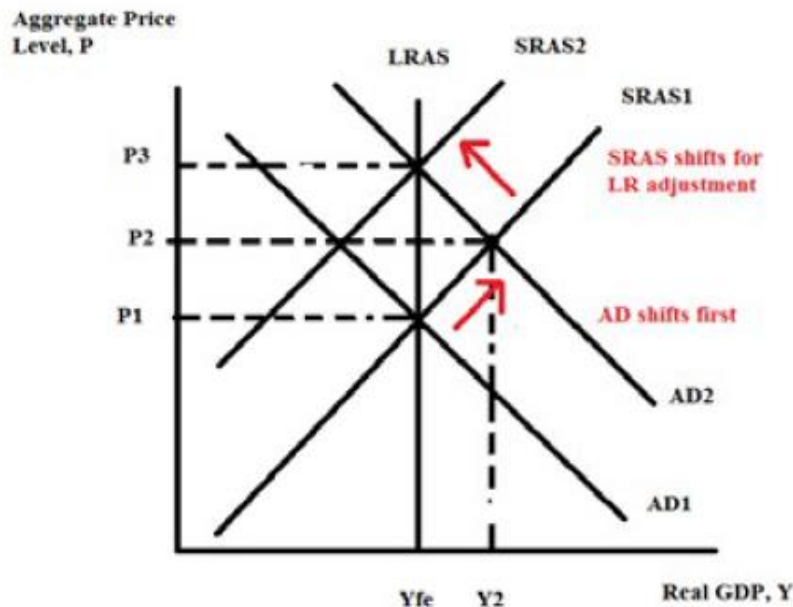
d.   (Continuing this question from (c)) Find the U.S. data on the "US Real GDP Growth Rate per Year using the annual percentage change in US Real GDP, chained 2009 dollars (inflation-adjusted)" and the aggregate price level (use the inflation rate based upon CPI data) for the time period 1935 through 1945. Does the data on the level of real GDP and the inflation rate substantiate the short run predictions for the economy that you made in question (c)?

The data reveal that the level of real GDP increased a lot during the period from 1935 through 1945. You can find this data at the website: http://www.multpl.com/us-real-gdp-growth-rate/table/by-year .

U.S. Real GDP Growth Rate	
1945	48.82%
1944	76.87%
1943	78.21%
1942	64.41%
1941	33.71%
1940	19.39%
1939	23.92%
1938	24.99%
1937	43.21%
1936	34.55%
1935	3.78%

The inflation rate based upon the CPI for this period reveals that inflation was positive during the war years (1941-1945). The source of this data is the website: https://inflationdata.com/Inflation/Inflation_Rate/HistoricalInflation.aspx.

U.S. CPI inflation rate	
1946	8.43%
1945	2.27%
1944	1.64%
1943	6.00%
1942	10.97%
1941	5.11%
1940	0.73%
1939	-1.30%
1938	-2.01%

1937	3.73%
1936	1.04%
1935	2.56%

5)   This is a complicated problem using your knowledge of the AD/AS Model as well as you knowledge of the Keynesian Model. Suppose you are given the following information about an economy:

$C = 155 + .80(Y - T) - 10 P$
$T = \$50$ million
$TR = \$0$
$G = \$80$ million
$I = \$20$ million
Net Exports $= NX = (X - IM) = -\$15$ million

AD equation: $AD = Y = C + I + G + (X - IM)$
SRAS equation: $Y = 50 P$
LRAS equation: $Y = Yfe$

Yfe = real GDP at full employment = $600 million

The full employment unemployment rate (the natural rate of unemployment) is 5% and you are told that for every $100 million that real GDP is less than full employment real GDP that the unemployment rate increases by 1%.

a.   Given the above information, find the equation for the AD curve for this economy. Write this equation in x-intercept form (where Y or real GDP is measured on the horizontal axis and P, the aggregate price level, is measured on the vertical axis). Show your work in its entirety here.

$Y = C + I + G + NX$
Replace C with the consumption function:
$Y = 155 + 0.8(Y - T) - 10P + 20 + 80 - 15$
$0.2Y = 155 - 0.8*50 - 10P + 100 - 15$
$0.2Y = 200 - 10P$

The AD curve is $Y = 1000 - 50P$

b.   Given your equation for AD you found in (a), and the short-run AS equation you were given, find the short-run equilibrium level of real GDP, Ye, for this economy. Then, find the aggregate price level for this economy. Finally, draw a graph depicting this economy's short-run equilibrium as well as the AD curve, the SRAS curve, the LRAS

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curve, and Yfe. Measure the aggregate price level, P, on the vertical axis and real GDP, Y, on the horizontal axis. Make sure your graph is completely and carefully labeled.
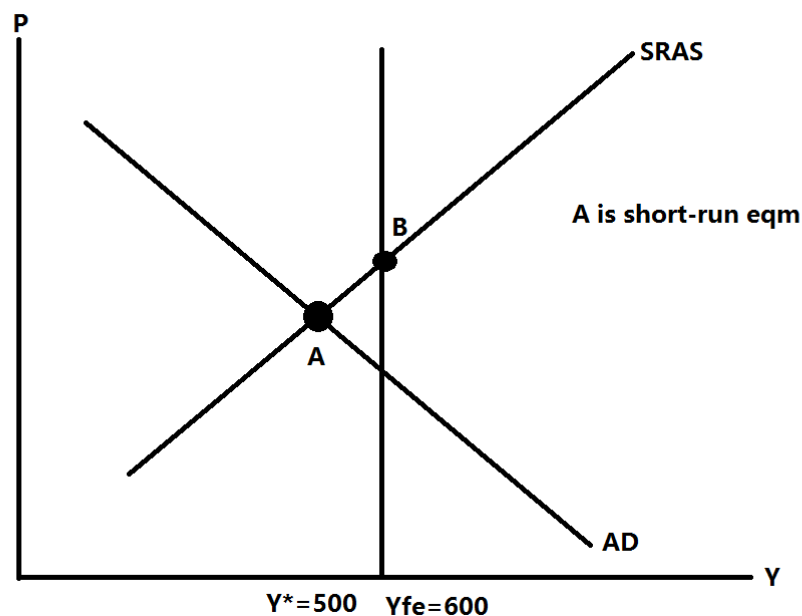
We equate AD and SRAS to get short-run equilibrium.
1000 - 50P = 50P
P* = 10
Y* = 500

The short-run real GDP is below the GDP at full employment level. This economy is therefore in a recession with unemployment rates above the natural rate of unemployment.

c.   Given your answer in (b), what is the actual unemployment rate in this economy in the short-run? What is the cyclical unemployment rate in the short run?

The short run Y is smaller than the full employment GDP by $100 million, so the actual unemployment rate is 6%.

From the definition of natural unemployment rate: frictional + structural unemployment rate = 5%, so the 1% of unemployment must be cyclical unemployment.

d.   Given your answer in (b), calculate the value of C and Sp in the short-run.

Plug in P* and Y* we solved in (b) to the consumption function:
C* = 155 + 0.8(500 - 50) - 10*10
C* = 155 + 400 - 40 - 100 = $415 million

Sp = Y - T - C = 500 - 50 - 415 = $35 million

e.   Suppose that the political leader in this economy wishes to return this economy to Yfe through government spending policy. First, will government spending need to be increased or decreased given the current economic situation? Then, calculate what the value of government spending will need to be in order to get this economy back to full employment. WARNING: THE MULTIPLIER WILL NOT WORK HERE BECAUSE THE AGGREGATE PRICE LEVEL IS NOT CONSTANT! Show your work and then prove that your answer will do the trick! [Hint: this is a multi-step calculation: so provide the step-by-step analysis you are using.] Assume that the SRAS and LRAS curves are not changing and that the slope of the new AD curve after the implementation of the fiscal policy is the same as the initial AD curve's slope.

To get the economy to Yfe we need more spending and the proposal to get that additional spending is to increase government spending. We will need to get enough additional spending to shift the AD curve to the right so that it intersects both the SRAS and the LRAS curve at their point of intersection.

To get the economy to Yfe we must be at the point where the LRAS curve and the SRAS curve intersect (point B in the graph below). And we want to shift the AD curve to the right by increasing G.
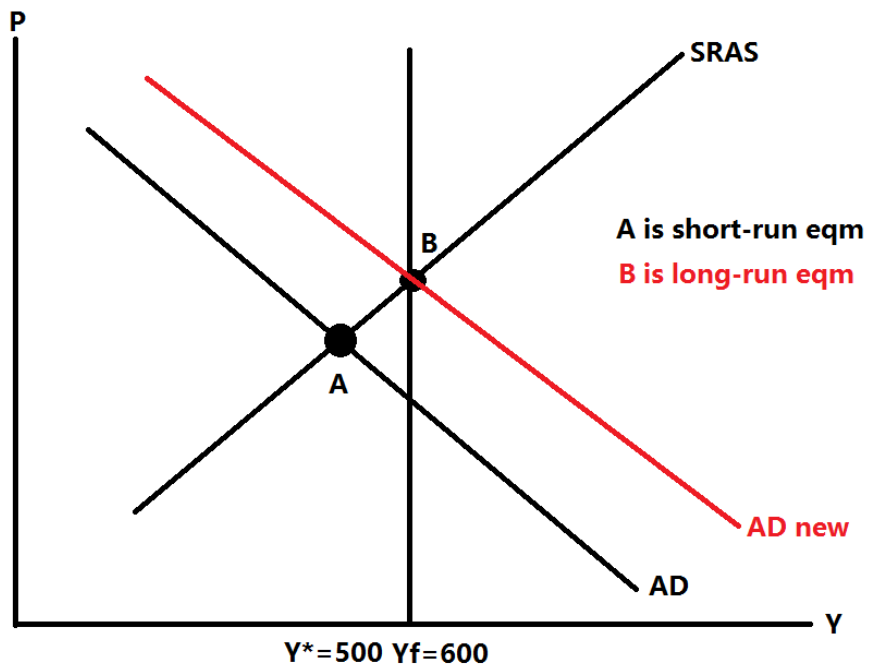
Assume GG is the government spending level we want to solve for.

To find the new AD equation:

$Y = C + I + GG + NX$

Y = 155 + 0.8(Y - 50) - 10P + 20 + GG - 15

0.2Y = 155 - 40 - 10P + 20 + GG - 15 = 120 - 10P + GG

Y = 600 - 50P + 5GG

We also know that Ye = Yfe = 600. So we can write the AD relationship as: 600 = 600 - 50P + 5GG or 50P = 5GG or P = (1/10)GG

We also know the SRAS curve as Y = 50P and if Ye = Yfe = 600 then P = 12

So, if P = 12 then P = (1/10)GG or 120 = GG.

The government spending should be 120 for the economy moves from point A to point B. Therefore, the government spending should increase by $40 million ($120 million - $80 million).

6)   Suppose that the required reserve ratio is 10% of demand deposits and that the financial system we are analyzing here has no currency drains (that is, all monies are held as demand deposits in the financial system and no one holds currency) and that banks do not have excess reserves. Answer this set of questions based on this information. Assume that the net worth for the banks in the financial system is equal to $0 (this simplifies our calculations a lot!).

a.   If the banking system has $400 million in demand deposits, what level of reserves did the central bank put into the monetary system in order to support this level of demand deposits? Explain your answer.

If the level of demand deposits is $400 million in the financial system and the required reserve ratio is 10%, then we know the following:

Money Supply = (1/rr) *(reserves)
$400 million = (1/0.1)*(reserves)

$400 million = 10*(reserves)

Reserves = $40 million

b.   If the banking system has $400 million in demand deposits, what is the level of loans in the banking system? Explain your answer and in your answer provide a T-account.

Required Reserve 400*0.1=40 million	Demand Deposits 400 million
Loan 400-40= 360 million	

c.   Suppose that the central bank decides to buy $20 million in T-bills from the banks in the financial system. How will this transaction affect the banking system's overall T-account (we are just using one T-account here), what happens to the money supply in this economy, and what happens to the interest rate (predict whether the interest rate increases or decreases given the central bank's policy action). Show all calculations and provide the modified T-account depicting the overall impact of this policy.

The central bank buys $20 million in T-bills from the banking system.

The initial money supply increases by $20 million.

The total change in money supply is $\dfrac{20\ million}{required\ reserve\ ration} = \$200$ million

Then imagine we deposit this extra money into banks.

The interest rate would fall because when the central bank increases the supply of money this shifts the supply of money curve to the right and causes a movement down the demand for money curve to a lower interest rate.

Required Reserve 400*0.1=40 million
                              + 200*0.1
                              =60 million

Demand Deposits 400 million
                              + 200 million
                              =600 million

Loan

600 -60
=540 million

Interest rate

Money Supply

⟹ **Money supply shifts right**
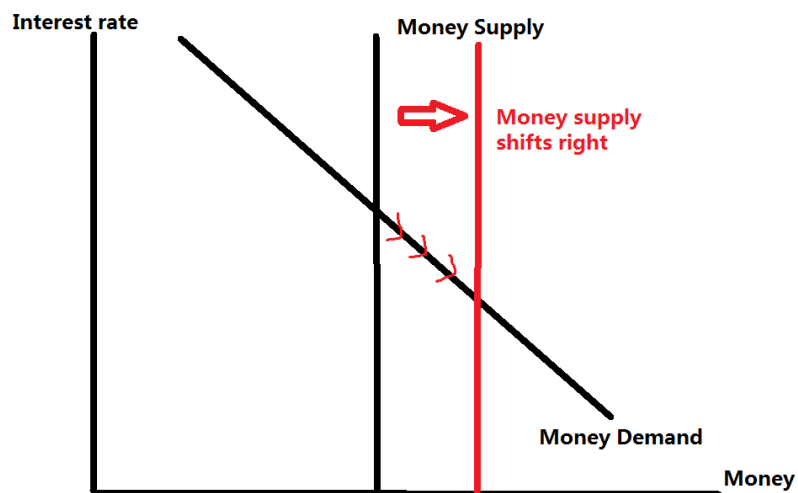
Money Demand

Money

7)   A final big problem using all sorts of things we have studied this semester! Suppose you are given the following information about an economy.

<u>Money Market</u>

Required reserve ratio = 10%

Ms (Money Supply) = 5,000

Md (Money Demand) = 10,000 - 500 r

r is the interest rate expressed as a percentage (e.g., if r = 5% then it would appear in the equation as 5 rather than .05)

Goods Market

C = 50 + .75(Y − T) − 2P where P is the aggregate price level

I = 1000 − 80r

Net Exports = NX = X − IM = 25

AD (Aggregate Demand): Y = C + I + G + (X − IM)

SRAS (short-run aggregate supply): Y = 12P

LRAS (long-run aggregate supply) : Yfe = 680

Fiscal Policy

T = 100

G = 50

Let's start by analyzing the data you have been given. Answer the following questions based on this data you initially have.

a.   What is the level of government saving, Sg, for this economy? Is this economy currently operating with a balanced budget, a budget deficit, or a budget surplus? Explain your answer.

The government saving is T - G = 50. The economy is currently operating with a budget surplus.

b.   What is the level of capital inflow, KI, into this economy? Is this economy currently operating with a trade balance, a trade deficit, or a trade surplus? Explain your answer.

The capital inflow is IM - EX = -25

Imports are less than Exports, so we have a trade surplus.

c.   Given the above information, find the equilibrium interest rate in the money market. Show your work. Then, compute the equilibrium level of investment spending for this economy.

Money supply = Money Demand

5000 = 10,000 - 500*r

r = 10
The equilibrium interest rate is 10%.

I = 1000 - 80*r = 1,000 - 80*10 = 200

d.   Make a prediction of what the value of private savings, Sp, is for this economy if it is operating at its short-run equilibrium. Show your work.

The demand for loanable funds is: I + government borrowing = 200 + (G - T)= 200 -50 = 150

The supply for loanable funds is: Private saving + capital inflow = Sp - 25

We equate the demand curve and supply curve for loanable funds:

150 = Sp - 25

Sp = 175

e.   Given the above information, find the equation for the AD curve for this economy. Write this equation in x-intercept form (where Y or real GDP is measured on the horizontal axis and P, the aggregate price level, is measured on the vertical axis). Show your work in its entirety here.

Y = C + I + G + X - M
Y = 50 + 0.75(Y - 100) - 2P + 200 + 50 + 25
Y = 50 + 0.75Y - 75 - 2P + 200 + 75

0.25Y = 250 - 2P
AD: Y = 1000 - 8P

f.   Given your equation for AD (see (e)), and the short-run AS equation you were given, find the short-run equilibrium level of real GDP, Ye, for this economy. Then, find the aggregate price level for this economy in the short run. Finally, draw a graph depicting this economy's short-run equilibrium as well as the AD curve, the SRAS curve, the LRAS curve, and Yfe. Measure the aggregate price level, P, on the vertical axis and real GDP, Y, on the horizontal axis. Make sure your graph is completely and carefully labeled.

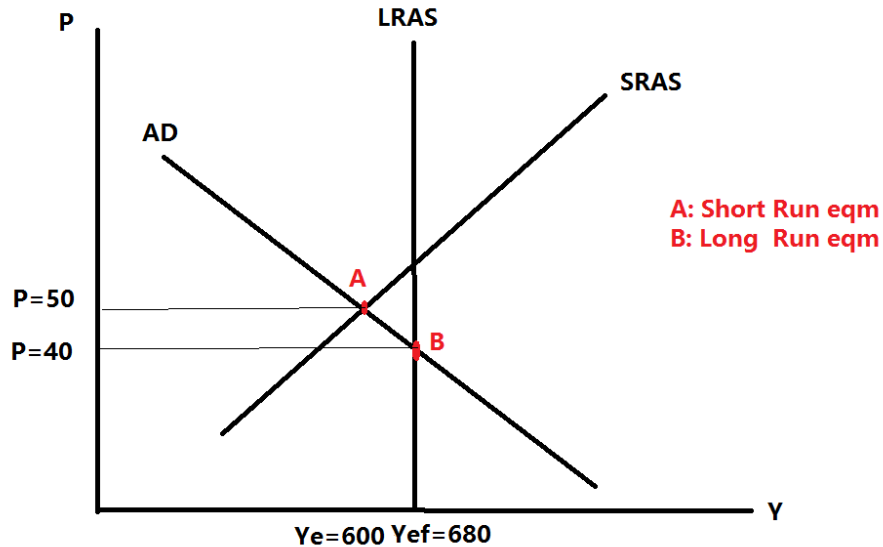The short run equilibrium is the intersection of AD and SRAS. So,

1000 - 8P = 12P

P* = 50, Ye in the short run = 600.

The long run equilibrium is the intersection of AD and LRAS. So,

1000 - 8P = 680

P* = 40,   Yfe in the long run = 680.

g.   Given your answer in (f): what do you know about the actual level of unemployment relative to the full employment level of unemployment or the natural rate of unemployment? Explain your answer.

This economy is in an economic contraction (a recession) and its current level of output is less than its full employment level of output. This implies that the actual unemployment rate is higher than the natural unemployment rate: we would anticipate that this is not sustainable for long!

h.   Given your answer in (f), calculate the value of consumption spending (C) in the short-run. Then calculate the value of Sp in the short-run and verify that your answer is the same as the one you gave in (c).

C = 50 + 0.75(600 - 100) - 2*50
C = 50 + 375 - 100 = 325

Sp = Y - T - C
Sp = 600 - 100 - 325 = 175