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?

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

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

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.

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

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!)

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

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

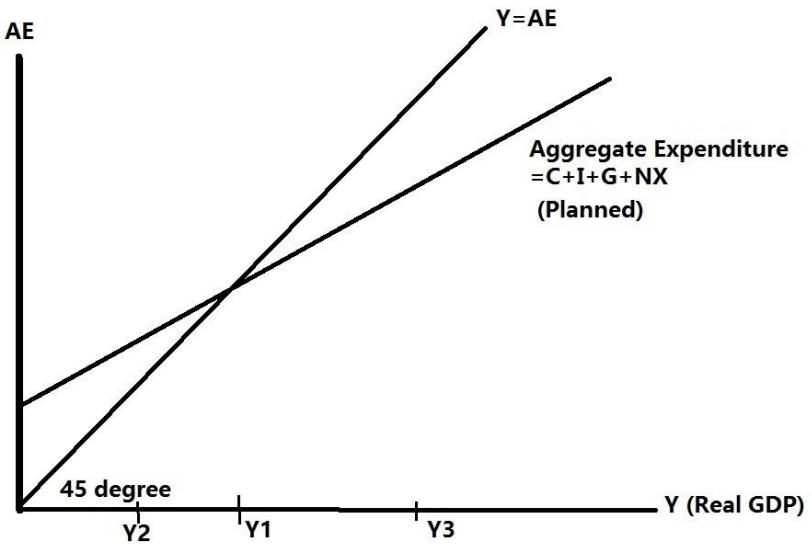
c. Suppose the equilibrium level of real GDP you calculated in (b) is less than the full employment level of output. The government is considering two policies to increase real GDP through either (i) increasing the level of government spending by $20 million, or (ii) cutting the level of taxes by 20%. 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.]

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.)

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

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?

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.

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.

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)?

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?

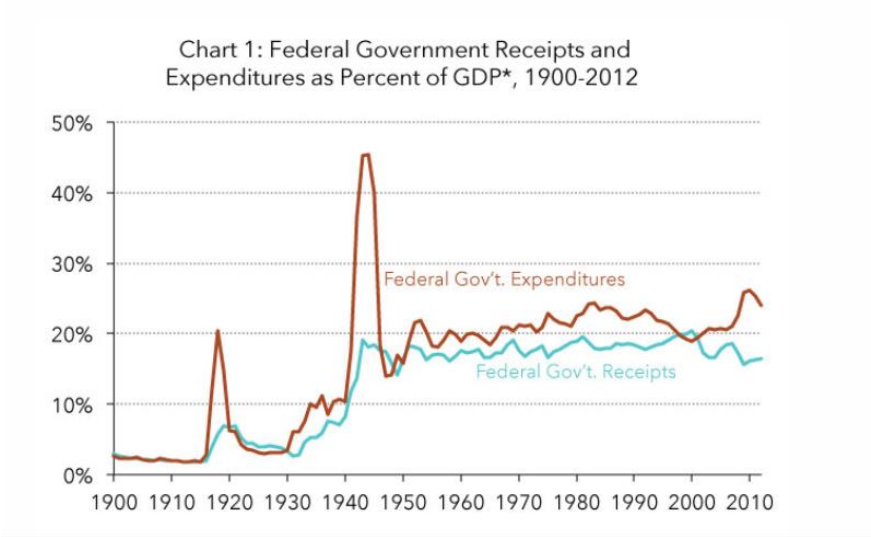
b. (1973 oil crisis)
In 1973, the members of the Organization of Arab Petroleum Exporting Countries (OPEC) proclaimed an oil embargo. Due to this embargo the price of oil rose from $3 per barrel to nearly $12 per barrel globally. Since oil is a major input used in the manufacture of other outputs, this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

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!]



This figure is taken from

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

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)?

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.

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 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.

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?

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

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.

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.

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.

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.

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)

<u>Goods Market</u>

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.

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.

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.

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.

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.

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.

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.

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).