

Economics 102
Spring 2018
Homework #5
Due 5/3/2018

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. Please remember the section number for the section **you are registered**, because you will need that number when you submit exams and homework. Late homework will not be accepted so make plans ahead of time. **Please show your work.** Good luck!

Please remember to

- Staple your homework before submitting it.
- Do work that is at a professional level: you are creating your “brand” when you submit this homework!
- Do not submit messy, illegible, sloppy work.

1. Consider the country Romanovia. In 2012 this country is a closed economy and that implies that capital inflows (KI) are therefore equal to zero. The loanable funds market is characterized by the following demand function, DLF, where the demand for loanable funds curve includes only investment demand for loanable funds:

$$\text{Demand for loanable funds: } r = 10 - (1/2000)Q$$

where r is the real interest rate expressed as a percent (e.g., if $r = 10$ then the interest rate is 10%) and Q is the quantity of loanable funds. The relationship between the supply of private savings (S_p) and the interest rate can be expressed by the equation:

$$\text{Supply of loanable funds for private savings: } r = 2 + (1/2000)Q$$

In 2012 the government of Romanovia had government expenditures (G) of \$8000, transfer payments (TR) of \$2000, and collected taxes (T) equal to \$14,000.

a) Calculate the value of government savings (S_g). Is the government running a budget deficit or a budget surplus? Show how you got your answer.

b) Derive an equation that expresses this economy's supply of loanable funds curve. Make sure that you include not only private savings but also government savings in this equation. (In this question we want you to model the supply of loanable funds as including both the private savings as well as the government savings.)

c) Given the demand for loanable funds curve you were given and the supply of loanable funds curve you derived in (b) calculate the equilibrium interest rate and the equilibrium quantity of loanable funds in this market. Show your work.

d) What is the level of private investment (I) in this economy when the loanable funds market is in equilibrium? Is there any crowding out of private investment in this market? Explain your answer.

2013 starts with a natural disaster in Romanovia. A flood brings destruction in the southern part of the country. The government decides to take care of the reconstruction needed due to this flood. The government expenditure (G) in 2013 increases to \$14000, the level of transfers (TR) is unchanged from 2012 and the level of taxes (T) is equal to \$12,000. There is no change in the supply of loanable funds from private savings and there is no change in the demand for loanable funds for private investment.

e) Calculate the value of government savings (S_g) for 2013 in this economy. Is the government running a budget surplus or a budget deficit?

f) Consider your answer in (e). If you wanted to model the government's budget situation on the supply of loanable funds side of the market would your answer in (e) cause the supply of loanable funds curve to shift to the left or to the right? Explain your answer.

g) Consider your answer in (e). If you wanted to model the government's budget situation on the demand for loanable funds side of the market would your answer in (e) cause the demand for loanable funds curve to shift to the left or to the right? Explain your answer.

h) Write an equation expressing the new demand for loanable funds curve in this market assuming that you are modelling both the demand for loanable funds for private investment as well as the demand for loanable funds to finance the government budget deficit.

2. Suppose that you are giving the following information for a certain economy:

Autonomous Taxes = $T = \$50$ million
Government spending = $G = \$70$ million
Exports = $\$60$ million
Imports = $\$20$ million
Autonomous Investment = $I = \$100$ million

Assume that Transfers, TR , are equal to zero in this economy. You are also given the following relationship between household consumption (C) and after-tax income ($Y-T$):

After-tax income	Household consumption
\$100 million	\$30 million
\$150 million	\$70 million
\$200 million	\$110 million
\$250 million	\$150 million

Use the Keynesian Model to answer the following set of questions:

a) Find the marginal propensity to consume (MPC) and the autonomous level of consumption in this economy.

b) Find the equilibrium level of GDP, Y , in this economy. Provide a graph that illustrates this equilibrium. In your graph measure Aggregate Expenditure, AE , on the vertical axis, and real GDP, or Y , on the horizontal axis.

c) Find the equilibrium level of private saving in this economy. Show that the loanable funds market is also in equilibrium.

d) Suppose that the full employment level of output for this economy is 800 million. To boost the GDP to the full employment level, the government decides to increase its spending while holding the tax rate constant. How much should the government spending be increased by?

e) Instead of a government spending increase, the government decides to use a tax cut to increase the GDP to the full employment level while holding the level of government spending fixed. What is the size of the tax cut?

f) Due to a trade dispute with foreign countries, both imports and exports for this economy have fallen to zero. The government still wants to restore the GDP to the full employment level of 800 million using a tax cut. Given this information, and holding everything else constant, can the government still reach its goal through this policy?

g) Continue with the scenario in part f). The government now increases its spending to raise the level of GDP to 800 million. However, it simultaneously raises the tax in order to keep its budget deficit at a constant level. How much should the government spending be increased by?

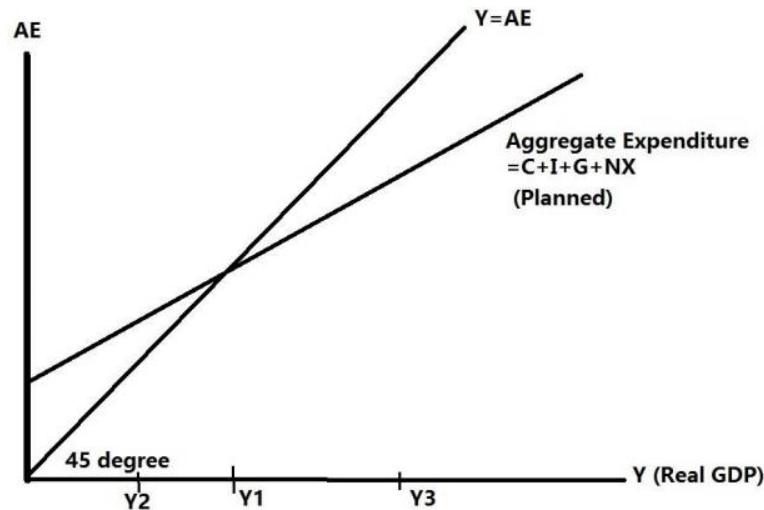
3. The balance sheets (sometimes called T-Accounts) of the Central Bank and the private banking system in Prelimania are provided below. In this economy we assume that no one holds currency (i.e., money doesn't leave our circular flow framework) and all purchases are made via debit cards or checks. We also assume that private banks do not hold excess reserves and fully adjust their holdings after a change in monetary policy. Use this information to answer the following questions:

Central Bank			
ASSETS		LIABILITIES	
T-BILLS	\$15,000	Reserves	\$15,000
Private Banking System			
ASSETS		LIABILITIES	
RESERVES	\$15,000	Demand Deposits	\$60,000
T-BILLS	\$32,500		
LOANS	\$12,500		

a. Given the above information, what is the required reserve ratio in Prelimania?

- b. Now, suppose that the Central Bank makes an Open Market Purchase of \$5,000 worth of Treasury Bills (also called T-bills) from the banking system. Show how this impacts the t-accounts before the banking system adjusts to the required reserve level.
- c. Immediately after the Open Market Operations in part (b), does the banking system have excess reserves or insufficient reserves?
- d. Starting from the T-account in part (c), show how the banking system adjusts its reserve holdings to eliminate insufficient or excess reserves.
- e. What will happen to the money supply of the economy after the Open Market Operation described in part (b)? Holding everything else constant, what happens to the equilibrium market interest rate?

4. 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 line?

- 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 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)?

5. Suppose you are given the following information about an economy:

Required reserve ratio is 10%

Money Demand (Md): $Md = 30,000 - 500r$ where r is the interest rate (When the interest rate is 3%, it means $r = 3$)

Investment Spending (I): $I = 700 - 20r$

Aggregate Expenditure (AE): $AE = C + I + G + (X - IM)$

Consumption Spending (C): $C = 3600 + 0.2(Y - T) - 100P$ where P is the aggregate price level

Government Spending (G): $G = 450$

Net Exports (NX): $NX = X - IM = -350$

Autonomous Taxes (T): $T = 100$

Assume that Transfers (TR) = 0

Aggregate Demand (AD): $AD = AE = Y = C + I + G + (X - IM)$

Long run Aggregate Supply (LRAS): $LRAS = Y_{fe} = 4,000$

Short run Aggregate Supply (SRAS): $Y = 600P - 1,875$

a. Given the above information and that the equilibrium level of Investment Spending (I) is 620, what is the equilibrium interest rate in this economy?

b. If the money market clears (i.e. the supply of money equals the demand of money), what is the level of the money supply in the economy?

c. Given the above information, find the equation that expresses this economy's Aggregate Demand for goods and services.

d. In the short run, what is the equilibrium level of real GDP (Y) and the aggregate price level (P)? Show your calculations in finding this value of Y . Draw a graph illustrating this short run equilibrium. In your graph include the LRAS curve as well. In your graph measure the aggregate price level on the vertical axis and real GDP on the horizontal axis.

e. What is the equilibrium price (P) and output (Y) level in the long run? Assume that the government does not intervene in this market in order to get to the long run equilibrium. How does the short run equilibrium output calculated in Part (d) compare to the long run equilibrium level? How does the short run unemployment rate compare to the natural rate of unemployment?

f. The economy is current at the short run equilibrium. Suppose the government sets the goal to “cool down” the economy and achieve full employment through fiscal policies (changing the level of government spending). To achieve full employment and holding everything else constant, how much should the level of government spending be decreased by? Hint: you will need to first find the aggregate price level for this economy when it returns to full employment through the use of fiscal policy. It is okay to approximate this aggregate price level to two places past the decimal.