

Economics 102
Fall 2017
Homework #5
Due 12/12/2017

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. 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.
- Show your work to get full credit.

1. The following table gives some information regarding GDP (Y), Consumption (C), and Taxes in the nation of Gondor. Assume that transfers (TR) are equal to zero in this nation.

	Y	C	T
2016	600	350	75
2017	700	400	75

a. Given the above information, assuming that autonomous consumption and the marginal propensity to consume are constant, find an equation for consumption as **a function of disposable income** (Disposable Income = $Y_d = Y - T$).

b. Now, write the equation for consumption as **a function of total income** (GDP or Y).

c. Finally write the private savings functions: first, **as a function of disposable income**, and then as **a function of total income**.

d. Given the information about this economy described in the table below, find the equation for Aggregate Expenditure (that is, $AE = C + I + G + NX$). What is the equilibrium level of GDP in this economy in 2016? Also, what was the change in inventories in 2016?

Other Expenditure Levels in 2016	
Investment (I)	\$150
Government Spending (G)	\$100
Export (X)	\$100
Import (IM)	\$75

2. [Continued from Question 1] Suppose now that you are an economist working for the government of Gondor. In 2016, you know that the full employment output in this economy (Y_{fe}) is equal to \$700.

a. From your result from No.1 and the given information regarding the full employment output in this economy, determine whether the economy of Gondor in 2016 is at FE (the full employment level of output) or not.

Now, you are supposed to come up with an idea for leading the economy to reach FE in 2016. You can implement some government policy packages: a change in government spending (G), or a change in taxes (T).

b. Calculate the change in government spending needed in order to reach FE in 2016. Can this policy consideration lead the economy to reach FE during this year?

c. Suppose that instead of a change in government spending to reach the FE level of output that this government implements a change in autonomous taxes in order to reach the same FE level of output in 2016. For this problem assume there is no change in the level of autonomous consumption with respect to disposable income (you found this value in (a) of problem #1) and there is no change in the marginal propensity to consume. All other levels of spending stay constant in this economy: what must the new level of autonomous taxes be in order to reach the FE level of output in 2016?

3. Suppose we have a loanable funds market in equilibrium, where the government has a balanced budget and trade is balanced. The equations for the quantity of loanable funds demanded and the quantity of loanable funds supplied are given by the following equations:

$$Q^D = 4000 - 50r$$

$$Q^S = 100r + 1000$$

where r is the interest rate in percent (i.e. $5 = 5\%$).

a. Which of the above equations represents the relationship between the interest rate and the level of private savings? Which of the above equations represents the relationship between the interest rate and the level of private investment?

b. Holding everything else constant, suppose the government runs a deficit. Model this as a shift in the supply curve of loanable funds curve. What happens to the equilibrium interest rate relative to its initial level because of this change? What happens to the quantity of loanable funds relative to its initial level because of this change?

c. Now, model the same government deficit as a shift in the demand for loanable funds curve. What happens to the equilibrium interest rate relative to its initial level because of this change? What happens to the quantity of loanable funds relative to its initial level because of this change?

d. Are your answers for the direct of the changes in the interest rate and quantity of loanable funds from (b) and (c) the same? Why or why not?

e. Consider the same government deficit. What happens to the level of private savings relative to its initial level, the level of private investment relative to its initial level, and the level of consumption spending relative to its initial level? Does it alter your answer to this question whether you model the government deficit on the supply of loanable funds side of the market or the demand for loanable funds side of the market? Why or why not?

f. Now, suppose the government is back to its initial situation where it has a balanced budget again. What is the equilibrium interest rate in this economy? What is the equilibrium quantity of loanable funds? Show your work.

g. Suppose that holding everything else constant, the economy increases imports by \$2000 and decreases exports by \$500. Given this information, does the economy have a trade surplus or a trade deficit? Does it have positive or negative net capital inflows?

h. Given the changes in exports and imports described in (g), what is the new equilibrium interest rate in this economy? What are the new levels of private investment and private savings?

4. Consider the AS-AD model to answer the following questions. Suppose for each scenario that we start in long-run equilibrium.

a. Suppose that the government raises taxes, holding everything else constant. What happens to real GDP and aggregate price level in the short run? What happens to real GDP and aggregate price level in the long run?

b. Suppose a widespread survey of consumers and businesses indicates that there is increased optimism for the future. What do you expect to happen to real GDP and aggregate price level in the short run and long run?

c. Suppose that the government passes regulations that require workers in retail to fill out daily forms based on their sales for the day. What happens to real GDP and the aggregate price level in the short run and long run?

d. Suppose the government increases spending and at the same time increases taxes. What happens to real GDP and the aggregate price level in the short run and long run given these changes?

5. The balance sheets (also known as the T-Account) of the central bank and the private banking system in Utopia are provided below. In this economy no one holds currency (i.e., there are no currency drains) and all purchases are made by writing checks (or using debit cards). Furthermore, private banks never hold excess reserves after the banks make full adjustment for any monetary policy change. Use this information to answer the following questions.

Central Bank				Banking System			
Assets		Liabilities		Assets		Liabilities	
T-bills	\$12,500	Reserves	\$12,500	Reserves	\$12,500	Demand Deposits	\$50,000
				T-bills	\$27,500		
				Loans	\$10,000		

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

b. The central bank now makes an Open Market Purchase of \$2,500 worth of Treasury Bills (T-bill) from the banking system. Show how this decision first impacts these t-accounts before any adjustment with regard to returning to the required reserve levels has been made (show just the first round effects of this transaction and not the final full adjustment to this transaction).

c. Immediately after the central bank’s Open Market Operation described in part (b), does the banking system have insufficient or excess reserves? Quantify the level of these reserves relative to the required amount for the given amount of demand deposits.

d. Holding excess reserves is costly for the banks because banks could have lent out the excess reserves and earned interest from these loans. Starting from the T-account you provided in (c), show how the banking system adjusts its reserve holdings to eliminate any insufficient or excess reserves they have given this open market purchase. Show clearly how this decision impacts these t-accounts.

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 will happen to the equilibrium market interest rate?

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

Required reserve ratio is 10%

Money Supply (Ms): $M_s = 20,000$

Money Demand (Md): $M_d = 25,000 - 1000r$ where r is the interest rate (When the interest rate is 3%, it means $r = 3$)

Investment Spending (I): $I = 350 - 10r$

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

Consumption Spending (C): $C = 2400 + 0.5(Y - T) - 100P$ where P is the aggregate price level

Government Spending (G): $G = 500$

Net Exports (NX): $NX = X - IM = -100$

Autonomous Taxes (T): $T = 200$

Assume that Transfers (TR) = 0

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

Long run Aggregate Supply (LRAS): $LRAS = Y_{fe} = 4,500$

Short run Aggregate Supply (SRAS): $Y = 500P - 1,000$

a. Given the above information, what is the equilibrium interest rate in this economy?

b. Given the above information, what is the level of investment spending in this economy?

c. Given the above information, calculate an equation that expresses this economy's aggregate demand for goods and services.

d. Find the short run equilibrium level of real GDP (Y) and the short run aggregate price level (P). Then 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. The government now sets a goal of using monetary policy to reach full employment. Can the government reach this goal using only monetary policy? In your answer remember that it is not possible to have the nominal interest rate go below 0% (the “Zero Lower Bound”).

HINT: Holding everything else constant, what is the highest level of real GDP in the short run this economy can attain if the government engages in activist monetary policy?

f. The government now sets a goal of using fiscal policy to reach full employment. Can the government reach this goal using only fiscal policy? To make this as simple as possible, assume that the fiscal policy is a change in the level of government spending holding everything else constant? Calculate what the new level of government spending would need to be if this economy was to reach full employment using fiscal policy only. Show your work.