Name: _____

Cosumnes River College
Principles of Macroeconomics
Problem Set 5
Due March 27, 2017

Spring 2017   Prof. Dowell

Instructions: Write the answers clearly and concisely on these sheets in the spaces provided. Do not attach extra sheets. Note that this problem set is long and requires lots of algebra. Overall the performance on questions on the last test which require simple algebra was very poor – even though algebra is a prerequisite for this class! The only way to overcome this is through practice. Hence, future problem sets will give you numerous opportunities to practice your algebra skills.

1. a. You are given the following data on a hypothetical economy. Note that in this economy there is no government sector so there are neither government purchases nor taxes.

Income	Consumption	Investment	Exports	Imports
6,600	5,900	700	700	600
6.800	6,050	700	700	600
7,000	6,200	700	700	600
7,200	6,350	700	700	600
7,400	6,500	700	700	600
7,600	6,650	700	700	600
7,800	6,800	700	700	600
8,000	6,950	700	700	600

   i. Using the above data, derive the consumption function and identify autonomous consumption. Hint: Find the MPOC, then use the point slope formula.

   ii. Using the above data and your result from part a, graph an expenditure schedule clearly labeling the vertical intercept and then use the income-expenditure (45 degree) line to illustrate the equilibrium level of GDP. Also label the equilibrium level of income and clearly indicate the amount.

b. Now there is a slight change and you are given the following new data. Everything is as before, except that now imports are also a function of income.

Income	Consumption	Investment	Exports	Imports
6,600	5,900	700	700	500
6.800	6,050	700	700	550
7,000	6,200	700	700	600
7,200	6,350	700	700	650
7,400	6,500	700	700	700
7,600	6,650	700	700	750
7,800	6,800	700	700	800
8,000	6,950	700	700	850

i. Using the above data, derive the import function and identify autonomous imports which may be a negative number. (Negative autonomous imports has no economic meaning ; it just "puts the import function in the right place.")

ii. Using the above data and your result from part a, graph an expenditure schedule clearly labeling the vertical intercept and then use the income-expenditure (45 degree) line to illustrate the equilibrium level of GDP. Also label the equilibrium level of income and clearly indicate the amount.

c. Now there is another change. Imports have returned to a constant value of 600 as they were in part a, but now investment is a function of income. :

Income	Consumption	Investment	Exports	Imports
6,600	5,900	680	700	600
6.800	6,050	690	700	600
7,000	6,200	700	700	600
7,200	6,350	710	700	600
7,400	6,500	72	700	600
7,600	6,650	730	700	600
7,800	6,800	740	700	600
8,000	6,950	750	700	600

i. Using the above data, derive the investment function and identify autonomous investment.

ii. Using the above data and your result from part a, graph an expenditure schedule clearly labeling the vertical intercept and then use the income-expenditure (45 degree) line to illustrate the equilibrium level of GDP. Also label the equilibrium level of income and clearly indicate the amount.

d. In each of the three cases above, suppose investment rises uniformly by 200. That is, at each income level, investment is 200 units higher that stated in the tables for parts a, b, and c. Find the new equilibrium GDP in each case and calculate the multiplier.

For part a:

Income	Consumption	Investment	Exports	Imports
6,600	5,900	900	700	600
6.800	6,050	900	700	600
7,000	6,200	900	700	600
7,200	6,350	900	700	600
7,400	6,500	900	700	600
7,600	6,650	900	700	600
7,800	6,800	900	700	600
8,000	6,950	900	700	600

For part b:

Income	Consumption	Investment	Exports	Imports
6,600	5,900	900	700	500
6.800	6,050	900	700	550
7,000	6,200	900	700	600
7,200	6,350	900	700	650
7,400	6,500	900	700	700
7,600	6,650	900	700	750
7,800	6,800	900	700	800
8,000	6,950	900	700	850

For part c:

Income	Consumption	Investment	Exports	Imports
6,600	5,900	880	700	600
6.800	6,050	890	700	600
7,000	6,200	900	700	600
7,200	6,350	910	700	600
7,400	6,500	920	700	600
7,600	6,650	930	700	600
7,800	6,800	940	700	600
8,000	6,950	950	700	600

d. Comment on your answers in part d. What do you observe about the multipliers and what explains your observation?

2. A closed economy has a consumption function:

$$C = 100 + 0.8(Y - T)$$

The government budget is balanced with purchases and taxes both fixed at 500. Investment is 400. Find equilibrium GDP.

3. Find the equilibrium level of GDP in an open economy in which investment is always 400, net exports is always 150, the government budget is balanced with purchases and taxes both equal to 600 and the consumption function is as follows:

4. Ivyland has the consumption function, $C = 50 + 0.8(Y - T)$. Firms in Ivyland always invest 350 and net exports are initially zero. The government budget is balanced with spending and taxes both equal to 250.

    a. Find the equilibrium level of GDP.

    b. <u>Derive</u> the expenditure multiplier.

    c. How much is saved in this economy? Is saving equal to investment?

    d. New, suppose that an export promotion drive succeeds in raising net exports to 50. Answer parts a, b, and c again under these circumstances.

        For a:

For b:

For c:

5. In Hawksville, consumers spend (consume) according to the equation $C = 100 + 0.8(Y - T)$. Investment is 500, government purchases are 500, exports are 300, imports are 400 and taxes are fixed at 500.

   a. Find the equilibrium level of GDP. If full employment comes at $Y^{POT} = 3,450$, is there a recessionary or an inflationary gap? How large is the gap?

   b. Now, suppose neighboring countries increase their demand for Hawksville's exports from 300 to 400. Find the new equilibrium level of GDP. Is there a recessionary or an inflationary gap and how large is it?

   c. Find the multiplier.

d. Now the citizens of Hawksville change their spending habits on imports from M = 400 (that is imports fixed at 400) to M =250 + 0.05Y (that is imports are 250 plus five percent of income or GDP). Exports, investment and the government budget are all as in part a. Answer questions a and b again sing this new import function. Are your conclusions different that be for? If yes, explain.

e. Find the multiplier from part d. Please derive it algebraically. Don't just write it down.

6. We will now allow the price level in Hawksville to vary. Go back to all the conditions at the beginning of the previous question (question #5), except change the consumption function to $C = 0.04(\omega/P) + 0.8(Y - T)$ where ω is the nominal or money value of wealth and P is the price level: hence, ω/P is real wealth. The money value of wealth is fixed at $\omega = 2,500$ throughout this problem, but P will change.

   a. Assume first that $P = 1$. Find equilibrium GDP.

   b. Repeat your calculations from part a, but first with $P == 1.25$ and then with $P = 0.8$

   c. Plot the above results on a diagram with price on the vertical axis and income on the horizontal axis and write out an equation for the resulting line. What have you drawn?