Problem Solving Questions:

1. **C1 of Assignment # 5**

2. **Consider the following simple model of an economy operating with fixed wages, prices, and interest rates, and excess capacity (operating below the full-employment level):**

$$C = 400+0.8Y_d \qquad I = 500$$

   where *C* is consumption, Y_d is disposable income (equal to national income, *Y*, in the absence of a government sector), and *I* is investment.

   (a) **Solve for aggregate expenditures (*AE*) as a function of *Y*, and calculate the equilibrium level of national income. Illustrate your equilibrium in a diagram with *AE* on the vertical and *Y* on the horizontal axis. What is the value of the multiplier? [5]**

   $Y_d=Y$

   $AE = C+ I = 400+0.8Y+500 = 900 + 0.8Y$

    In Equilibrium Y = AE, so:

   $Y = 900+0.8Y$

   $0.2Y = 900$

   $Y = 4500$

   Multiplier=1/(1-MPC)=1/0.2=5

   To illustrate the equilibrium we need to plot the *AE* function with Y on the horizontal axis and Y on the vertical axis. Since *AE* is a linear function, all we need are two points through which the line will go. If *Y* is 0, *AE* is 900. So, one point is (0, 900). From the above calculation we know that if *Y=4500*, *AE=4500*. That means, at the point (4500, 4500), *AE* line will intersect the 45-degree line (*Y=AE* line).
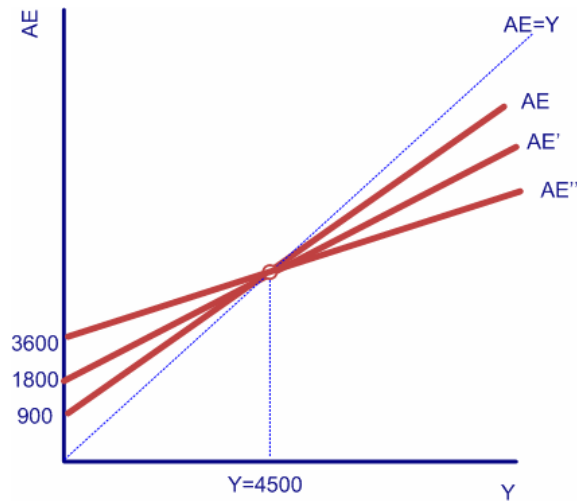
(b) Now, suppose we add a government sector with:
$$T = 100+0.25*Y \qquad G = 980$$
where T is taxes (net of transfers) and G is government spending on goods and services. Calculate the new equilibrium level of national income. Illustrate in your diagram. What is the new value of the multiplier? Is the government running a surplus or a deficit? [5]

$Y_d=Y-T$
$Y_d=Y-100-0.25*Y$
$Y_d=Y(1-0.25)-100$

$AE = C+ I + G = 400+0.8((1 - .25)Y-100)+500 + 980$
$AE=900-80+980+0.8*0.75Y$
$AE=1800+0.6*Y$

In Equilibrium Y = AE, so:

$Y = 1800+0.6Y$

$0.4Y = 1800$

$Y =4500$

Follow the same method explained in part (a) to show the equilibrium on the graph.

Multiplier = $1/(1-(1-t)MPC)=2.5$

Government budget balance:

    Revenues (T) = 100+0.25*Y=100+1125=1225

    Expenditures (G) = 980

    Therefore the budget has a surplus of 1225-980 = 245

(c) Now suppose we expand the model to include a foreign sector with:

$$M = 0.4Y \qquad\qquad X = 1800$$

where *M* is imports and *X* is exports. Calculate the new equilibrium level of national income. Illustrate the new *AE* function and equilibrium in your diagram. What is the new value of the multiplier? Does the country have a trade surplus or deficit? (ie. what is value of net exports?) [5]

    *AE = C+ I + G + (X − M) = 400+0.8((1 - .25)Y-100)+500 + 980+1800-0.4*Y*

    *AE=1800+0.6*Y-0.4*Y+1800*

    *AE=3600+0.2*Y*

 In Equilibrium Y = AE, so:

    Y = 3600+0.2Y

    0.8Y = 3600

    Y = 4500

Follow the same method explained in part (a) to show the equilibrium on the graph.

    Multiplier = 1/(1-(1-t)MPC+MPI)=1/0.8=1.25

    Trade balance = exports – imports

    *Trade balance = 1800-0.4*4500=1800-1800=0.*

    A country is running a balanced trade (no deficit/surplus)

(d) Explain why the multiplier decreases in value through parts (a) to (c). [5]

    In each successive model the number of "leakages" from the system increase (originally just to savings, then to taxes, then to imports). This means that after the initial effect of an increase in autonomous spending, less is put back into the system to produce national income in each "round" of the multiplier process. Therefore, the sum of all these increases (the multiplier) is smaller.

"True/ False/ Uncertain Explain" Type Questions

1. Questions from Part B of Assignment 6.
2. Other Questions will be discussed if time allows.