Economics 102 Fall 2007 Homework 4 Answer Key

1. You are given the following information about aggregate expenditures and output as well as the table below describing investment and savings behavior for a small open economy with a balanced budget.

GDP = 50,000
C = 25,000
X = 8,000
M = 12,000

i	I	S_p
8	7,900	30,000
3	21,900	15,000

  a. Assume a linear relationship, and find the demand equation for the loanable funds market.

We have two points of (I,i), so we can find the slope equal to
    $m = (i_2 - i_1) / (I_2 - I_1) = (8 - 3) / (7,900 - 21,900) = -5/14,000 = -1/2,800$
Then we can plug into the slope intercept form, $i = mI + b$
    $8 = -1/2,800 * 7,900 + b$
    $8 = -79/28 + b$
    $b = 303/28$

$i = -1/2800 * I + 303/28$
or if we rearrange we get the linear relationship of
$I = 30,300 - 2,800 * i$

double check to make sure both points work

$8 = -1/2800 * 7,900 + 303/28 = -79/28 + 303/28$ *Checks*
$3 = -1/2800 * 21,900 + 303/28 = -219/28 + 303/28$ *Checks*

  b. Assume a linear relationship, and find the supply equation for the loanable funds market. (Note: Check capital inflows (KI))

We have two points of (S_p,i), so we can find the slope equal to
    $m = (i_2 - i_1) / (S_{p2} - S_{p1}) = (8 - 3) / (30,000 - 15,000) = 5/15,000 = 1/3000$
Then we can plug into the slope intercept form, $i = mI + b$
    $8 = 1/3000 * 30,000 + b$
    $8 = 10 + b$
    $b = -2$

$i = 1/3000 * S_p - 2$

or if we rearrange we get the linear relationship of
$S_p = 3000*i + 6000$

double check to make sure both points work

$8 = 1/3000 * 30,000 - 2 = 10 - 2$ *Checks*
$3 = 1/3000 * 15,000 -2 = 5 - 2$ *Checks*

This however is only the private savings function, which is only part of the loanable funds supply curve as we have capital inflows equal to KI = M – X = 12,000 – 8,000 = 4,000, which we know is horizontally added to the private savings function we just found.

$S_p = 3000i + 10,000$ or $i = 1/3000 * S_p – 10/3$

  c. What is the equilibrium investment spending in this economy?

Set supply equal to demand in the loanable Funds Market which implies $I = S_p$
        Demand   : *(Private Investment)* $I = 30,300 – 2,800 * i$
        Supply   : *(Private Savings plus Kapital Inflows)* $S_p = 3,000i + 10,000$
$30,300 – 2,800 * i = I = S_p = 3,000 * i + 10,000$
$20,300 = 5,800*i$
$i = 203/ 58 = 3.5$
$I = 20,500 = 30,300 – 2,800*3.5 = 30,300 – 9,800$

  d. What is private savings in this economy?

Use the information above, from parts c and b to calculate from the private savings function, or use the fact that private savings is equal to total investment less capital inflows.
$S_p = 16,500 = 3000*i + 6000 = 3,000 * 3.5 + 6,000 = 20,500 – 4,000$

  e. What is government expenditure for this economy?

We know that $Y = C + S_p + (T\text{-}TR)$ *and that the budget is balanced, or* $G = (T\text{-}TR)$, *implying*
$G = Y – C – S_p = 50,000 – 25,000 – 16,500 = 8,500 = G$

Alternatively, we could have calculated government expenditure from the GDP relationship, $Y = C + I + G + X – M$, *implying*
$G = Y – C – I – X + M = 50,000 – 25,000 – 20,500 – 8,000 + 12,000 = 8,500$

2. If you were a classical economist, what would your opinion be if you overheard the following statements? Do you agree or disagree with the statements and why?

  a. "The interest rate is rising too fast; we should increase government spending to reduce it!"

Disagree, an increase in government spending will lead to a deficit, everything else held constant, which will drive up the interest rate and crowd out private investment.

b. "We are heading toward a recession; the government could slow this if they were to only spend less."

Agree, a decrease in government spending will lead to a surplus, everything else held constant, which will drive down the interest rate, induce more private investment at the same time decrease private savings and increase consumption. The increase in current consumption will add to current GDP measures, as will the increase in private investment as output will increase as capital levels increase.

c. "Classical economist cannot be correct; otherwise you would have never seen people standing in line to get the latest Play station version and having a few go home empty handed."

Disagree, classical economist believe all markets clear in the long run. They cannot explain short run phenomenon.

d. "Our current trade deficit is reducing the rate of return on my savings!"

Agree, the trade deficit is causing a positive capital inflow, resulting in a lowering of the equilibrium interest rate in the loanable funds market.

3. The following data (in millions) was gathered for Whyme in 2006, and provides insight into household, business, and government activities that year. Use this information for the following questions.

Consumption spending	1000
Government transfer payments	10
Government expenditures on goods and services	50
Private Savings	$S_p = 280 + 20i$
Private Investment	$I = 400 - 5i$
Government Surplus	10

a. According to the classical model, what are the equilibrium interest rate, private savings, and private investment in the loanable funds market? (Hint: The government surplus needs to be added to the supply for loanable funds!)

Set supply equal to demand in the loanable Funds Market

      Demand   : (Private Investment) $I_d = 400 - 5i$

      Supply   : (Private Savings plus Government Surplus) $I_s = 290 + 20i$

                         $S_p = 280 + 20i$ horizontally added with $I = 10$

      $400 - 5i = I_d = I_s = 290 + 20i$

      $110 = 25i$ or $i = 4.4$*

$$I* = 378 = 400 - 5(4.4) = 400 - 22 = I_d = I_s = 290 + 20(4.4) = 290 + 88$$

*The equilibrium interest rate, **i* = 4.4%**.*

*Equilibrium private investment, is the value demanded at the equilibrium interest rate **I***, which we found above to be **I* = 378**.*

Equilibrium private savings is the supply (without the government surplus) at the equilibrium interest rate, which we know is equal to 10 million less than the quantity invested. Thus private savings is $S_p =$ **368 million**.*

b. With the classical model that includes a foreign sector we know that leakages must equal injections. What must be true in Whyme in 2006 for this to hold?

Leakages $= S_p + (T - TR) + M = 368 + (70 - 10) + M = 428 + M$
Injections $= I + G + X = 378 + 50 + X = 428 + X$
In order for leakages to equal injections we must have that X = M, or that KI (capital inflows) equal zero.

c. What is GDP for Whyme in 2006?

We just found in part b that X- M = 0
$Y = C + I + G + X - M = 1000 + 378 + 50 + 0 = 1428$ million

Alternatively, we know that government surplus = 10, which implies that $(T - TR) - G = 10$, or $(T- TR) = 10 + 50 = 60$ or $T = 60 + TR = 60 + 10 = 70$

Y = 1428 million $= C + S_p + (T - TR) = 1000 + 368 + (70 - 10)$

d. The government of Whyme is contemplating a policy of a one-time gift to its neighboring country Whynot that would result in Whyme having a balanced budget. The government is concerned as to what would happen to its citizens and businesses, and has asked you to do an analysis for them. Assuming the relationship that describes private savings and private investment remain the same, output from the economy does not change, and that capital inflow and net taxes remain the same what would be the new level and percentage change (rate of change) compared to the levels without the policy in each of the following for Whyme if they make this one-time gift to Whynot?

       i. The interest rate

Set supply equal to demand in the loanable Funds Market
    Demand   *: (Private Investment)* $I_d = 400 - 5i$
    Supply   *: (Private Savings plus Government Surplus)* $I_s = 280 + 20i$
                     The budget is balanced, so no shift in either curve.
    $400 - 5i = I_d = I_s = 280 + 20i$

*120 = 25i or **i**** = 4.8*
I* = 376 = 400 – 5(4.8) = 400 – 24 = I_d = I_s = 280 + 20(4.8) = 280 + 96*

*The new equilibrium interest rate, **i****, is **4.8%**.*
*This is a (4.8 – 4.4)/4.4 *100 = **9.09%** percentage change.*

    ii. Private investment

*Equilibrium private investment is equal to **I****, which we found above to be **376**.*
*This is a (376– 378)/378 *100 = **-0.53%** percentage change.*

    iii. Private savings

*With a balanced budget, equilibrium private savings equals private investment, thus it is **376** million.*
*This is a (376– 368)/368 *100 = **2.17%** percentage change.*

    iv. Government Spending

*As the budget is now balanced, we know that G = (T-TR) = **60**, an **increase in 10 million**.*
*This is a (60– 50)/50 *100 = **20%** percentage change.*

    v. Consumption

*Total output remains the same, so Y= 1428 = C + S_p + (T- TR) = C + 376 + 60 = C + 436, which implies **C = 992** which is a **decrease in 8 million**, equal to the negative increase in private savings.*
*This is a (992– 1000)/1000 *100 = **-0.8%** percentage change.*

    vi. Is this a policy you would recommend if you were a consumer, why or why not?

As a consumer I am indifferent between the policies, since there is no change in real GDP or GDP per capita. Instead I am postponing consumption today for future consumption in later periods and in addition I am saving more today.

    vii. Is this a policy you would recommend if you were a business, why or why not?

As a business I do not enjoy this policy, as it has increased the interest rate, thus forcing me to postpone investment that I could have made without the policy in place.

  e. Rather than giving a onetime gift to Whynot, Whyme is considering a government spending program that changes the incentive to purchased goods from Whynot. The program would result in a balanced budget, and a 10 million dollar increase in imports.

Once again the government is concerned about its citizens and businesses, and has asked you to do an analysis for them. Assume the relationship that describes private savings and private investment remain the same, output from the economy does not change, exports and net taxes remain the same. What are the new levels of consumption, investment spending, private savings and the interest rate under this program?

There is no change under this program, *so the levels remain the same as before. The budget is balanced, but it results in a dollar for dollar change in capital inflowsc(KI). As capital inflows (KI) affect the loanable funds market the same way as a government surplus, we have the same results and no change.*

Kapital Inflow = M' – X' = (M + 10) – M = 10, as new imports equals old imports plus 10 million and new exports equal old exports, which we previously found to be equal to old imports.

Set supply equal to demand in the loanable Funds Market

Demand	*: (Private Investment)*	$I_d = 400 – 5i$
Supply	*: (Private Savings plus Kapital Inflows)*	$I_s = 290 + 20i$
	The budget is balanced now, but Kapital Inflows equal 10.	
	$I = 280 + 20i$ *horizontally added with* $I = 10$	

As the supply and demand equations are the same, we know that the equilibrium interest rate, level of private investment, and level of private savings are the same as before.

$400 – 5i = I_d = I_s = 290 + 20i$
*$110 = 25i$ or $i*** = i* = 4.4$*
*$I*** = I* = 378 = 400 – 5(4.4) = 400 – 22 = I_d = I_s = 290 + 20(4.4) = 290 + 88$*

Since private savings, output, and net taxes remain the same, we also know that consumption remained the same.