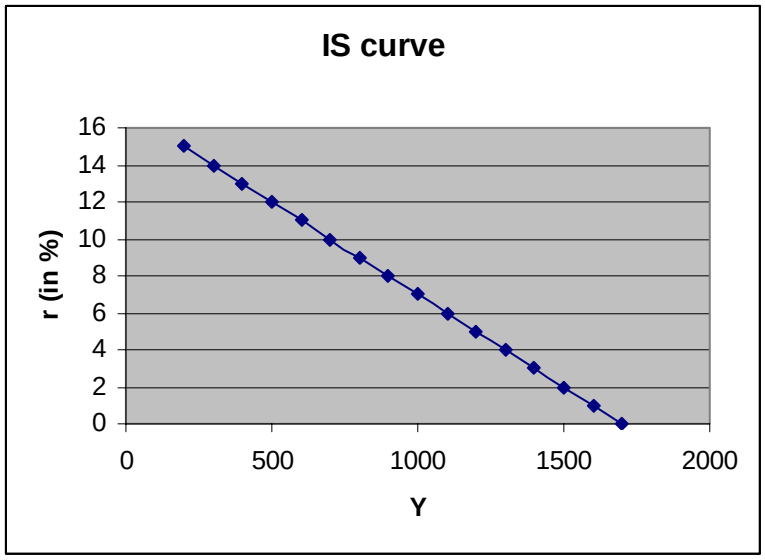
Economics 302
Spring 2007
Homework #5

Homework will be graded for content as well as neatness. Sloppy or illegible work will not receive full credit.

1. Consider a closed economy with consumption given by the equation C=200+2/3(Y-T). In addition, suppose that planned investment expenditure is 300 and the government runs a balanced budget with government spending equal to 300. Use your understanding of the Keynesian cross as a starting point to answer the following questions.

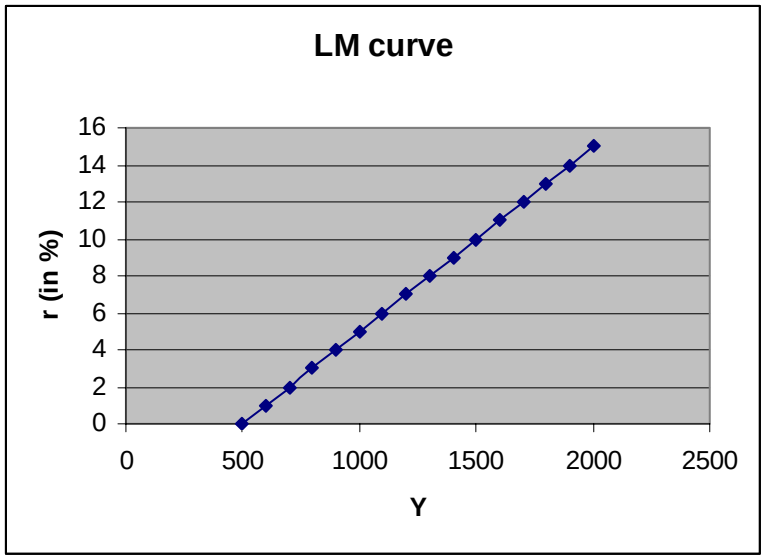
a. If Y is 1,500, what is planned expenditure? What is inventory accumulation or decumulation? Given your answer to the last question, would you expect equilibrium Y be higher or lower than 1,500? If you expect equilibrium Y to be different, explain the mechanism by which you would expect Y to change in this economy.
Planned expenditure is 1,600. Inventory deculmulation is 100. Equilibrium Y should be higher than 1,500. Finally, since planned expenditure is greater than actual production, firms must draw down existing inventories in order to meet demand. They will respond to this by hiring more workers and producing more (thus driving Y up towards the equilibrium level).
b. What is equilibrium Y?
To solve for equilibrium Y, set Y equal to planned expenditure (as a function of Y) then solve for Y. Equilibrium Y is 1,800.
c. What are equilibrium consumption, private savings, public savings, and national savings? [Hint: first solve for equilibrium consumption, then use the definitions that you already know.]
Equilibrium consumption follows from plugging 1,800 for Y into the formula for C. This gives C=1,200. Using familiar definitions, private savings is 300, public savings is 0, and national savings is 300.
d. Now, recalculate equilibrium income when G is reduced to 200, but T stays the same as above. What is the multiplier for government spending?
Equilibrium Y becomes 1,500 (i.e., it is lowered by 300). The multiplier on government spending is 3.

2. Next consider an economy with consumption function C=200+0.75(Y-T) and investment function I=200-25r, and where fiscal policy is summarized by G=T=100.
a. Use Excel to graph the IS curve for values of r ranging from 0 to 15. [Hint: plug in the given expressions for C, I and G into the equation Y=C+I+G. Then solve for Y as a function of only r. Use the resulting expression as an Excel formula which takes r from a neighboring cell. Have your 0 through 15 values of r in a column, so you can then copy your formula down.]
Solving for Y as suggested in the hint gives Y=1700-100r. Graphing gives:



b. Suppose the money demand curve is given by $(M/P)^d = Y-100r$. In addition, the money supply is 1000 and the price level is 2. Use Excel to graph the LM curve for values of r ranging from 0 to 15.

Solving the resulting money market equation for Y gives Y=500+100r. The graph is:



c. Find the equilibrium interest rate r and equilibrium level of income Y.

Equating the two equations (or looking very carefully at the above graphs) gives the equilibrium. r=6.0 and Y=1100.

d. Suppose that government purchases are raised from 100 to 150. How much does the IS curve shift? What is the new equilibrium interest rate? What is the new equilibrium level of income?

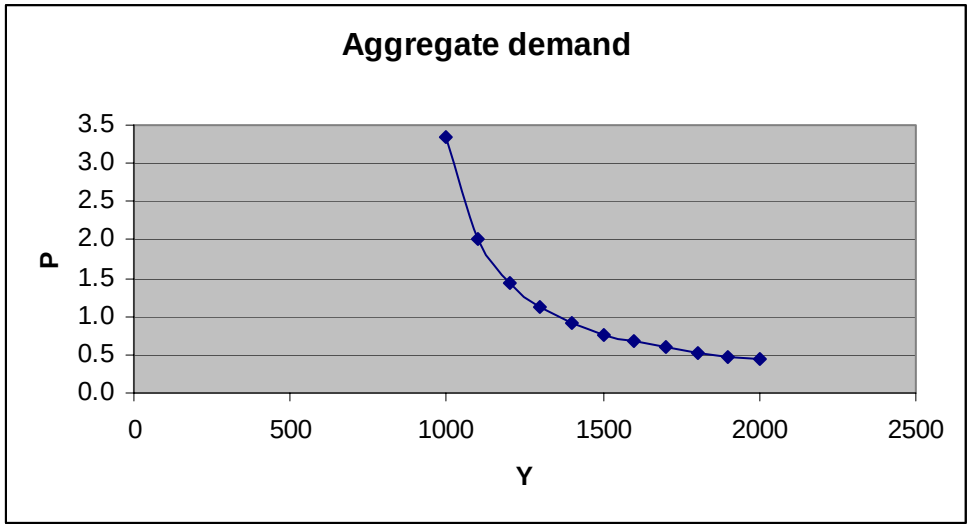
An increase in G shifts the IS curve to the right and has no effect on the LM curve. The new equilibrium interest rate solves Y=1900-100r=500+100r. Thus, r=7.0 and Y=1200.

e. Suppose instead that the money supply is raised from 1,000 to 1,200. How will the LM curve shift? What is the new equilibrium interest rate and what is the new level of income?

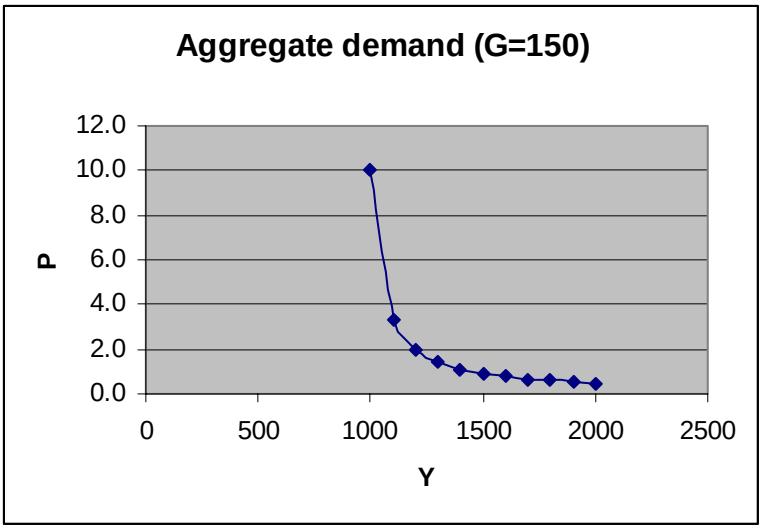
A monetary expansion shifts the LM curve to the right, resulting in a lower interest rate and higher Y. The new equation for r solves: 1700-100r=600+100r. Thus, r= 5.5% and Y=1150.

f. With the initial values for monetary and fiscal policy, suppose that the price level rises from 2 to 4. What is the new equilibrium interest rate? What happens to the level of income in equilibrium?
The new equation is 1700-100r=250+100r. Thus, r=7.5%, and Y=1000.

g. Build on your algebra from parts (a) and (b) to derive an equation for the aggregate demand curve. [Hint: Part (a) gave you an equation in terms of Y and r. Solve that equation for r. Part (b) gave you an equation in terms of P, r and Y. Solve this equation also for r. Now set the two equations equal and solve for P.] Now use Excel to graph the aggregate demand curve. Do this for values of Y equal to 1000, 1100, 1200, etc., up to 2000.
Solving part a for 100r gives the expression: 100r=1700-Y. Similarly, part b gives 100r=Y-1000/P. Setting the 100r's equal and solving for P gives:
P = 1000 / (2Y-1700). Finally, graphing in Excel gives:



h. Next, modify your Excel formula from part (g) to show what happens to the aggregate demand curve if fiscal policy changes as it did in part (d) (i.e., government purchases increase from 100 to 150). Use Excel to graph the new aggregate demand curve for the same values of Y as in part (g). Explain in words what happens to the aggregate demand and why.
The new equation is:
P=1000/(2Y-1900)
The resulting graph shifts right to give:

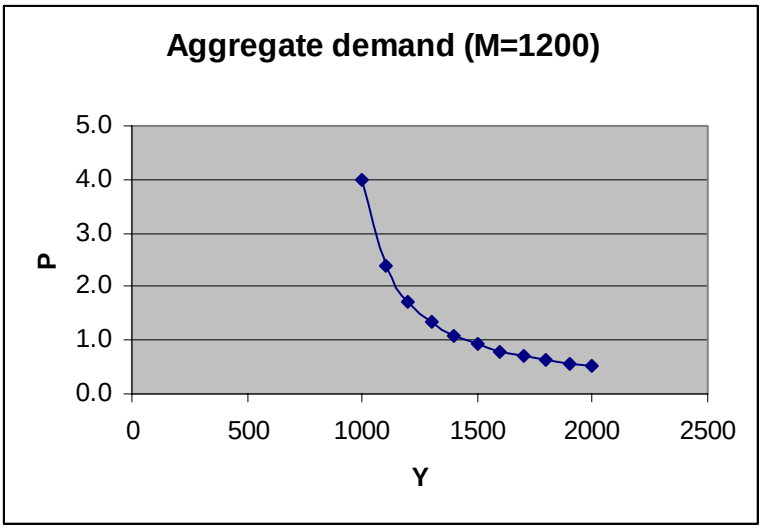


i. Similar to the last question, show what happens to aggregate demand monetary policy changes as it did in part (e) (i.e., the money supply increases from 1000 to 1200). Again, use Excel to graph the modified aggregate demand curve for the same values of Y as in part (g). Explain in words what happens to the aggregate demand and why.

The new equation is:

P=1200/(2Y-1700).

The new demand curve is:



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Which involves a shift to the left vis a vis the curve in part g.