

Homework will be graded for content as well as neatness, sloppy or illegible work will not receive full credit. This homework requires the use of Microsoft Excel.

1. Keynesian Cross

Consider a closed economy with consumption given by the following equation.

$$C = 100 + \left(\frac{2}{3}\right)(Y - T)$$

In addition, suppose that planned investment expenditure is 300 and that the government runs a balanced budget with 200 in government spending. Use the Keynesian cross as a starting point to answer the following questions.

- If Y is 1,100, what is planned expenditure? What is the change in inventory level? Given your answer to the last question, would you expect equilibrium Y be higher or lower than 1,100? If you expect equilibrium Y to be different, explain the mechanism by which you would expect Y to change in this economy.
- What is equilibrium Y ?
- What are the equilibrium levels of consumption, private saving, public saving, and national saving, based on the equilibrium level of output you just found?
- Compared to the answer you found in part (b), what is the new equilibrium income when Investment is reduced by 50? What is the Keynesian multiplier for investment spending?
- Compared to the answer you found in part (b), what is the new equilibrium income if taxes are increased by 75? What is the Keynesian multiplier for taxes?

2. IS-LM Model

Consider a closed economy described by the following equations.

$$C = 250 + \left(\frac{5}{7}\right)(Y - T)$$

$$I = 200 - 25r$$

$$G = 150$$

$$T = 70 + \left(\frac{1}{5}\right)Y$$

$$\left(\frac{M}{P}\right)^D = 200 - 10r + 0.1Y$$

$$M^S = 1000$$

$$P = 5$$

- Solve for the IS curve. [Hint: Use the Keynesian Cross equilibrium condition and solve for Y as a function of r .]

- b. Solve for the LM curve.
- c. Rearrange the equations you found in the previous two parts, solving for r , and fill in the table below pertaining to the IS and LM curves. (When appropriate round to the nearest unit, i.e. 3.6 is rounded to 4.) Graph the two curves on one graph using the completed table.

Y	IS	LM
0		
100		
...		
1500		

- d. Find the equilibrium output level using Goal Seek within Excel, and report the equilibrium interest rate. [Hint: Add another column to your created table, finding the difference in the IS and LM values. In Excel 2007, use the Data tab, Data Tools, What-If Analysis to find Goal Seek. In older versions of Excel, Goal Seek is under Tools. Once you have Goal Seek open, “set cell” is the cell containing the difference “to value” of zero (the equilibrium condition that $IS = LM$) “by changing” the output level cell for that line.]

Y	IS	LM	Difference
0	IS_0	LM_0	$IS_0 - LM_0$

- e. Solve for the equilibrium interest rate and output level by hand. Your equilibrium output level should agree with that found in the previous part of the problem.
- f. Use the IS and LM curves that you found earlier to derive the aggregate demand equation. [Hint: The IS curve describes all combinations of output levels Y and real interest rate levels r in which the goods market is in equilibrium. Rearrange the IS curve to solve for r . The LM curve describes all combinations of output levels Y , real interest rate levels r , and aggregate price levels P in which the money market is in equilibrium. Rearrange the LM curve to solve for r also, leaving price level as a variable P . Set the two equations equal to each other and solve for P to arrive at the aggregate demand curve.]
- g. Use Excel to graph the aggregate demand equation, allowing output to range from 200 to 1,000 in 100 unit increments. Does your aggregate demand curve look correct? Graphically verify that the previously found equilibrium output level and price level are on the AD curve.
- h. Suppose that government purchases are raised from 150 to 200. How much does the IS curve shift? Using the original LM curve, what are the new equilibrium interest rate and the new equilibrium level of income? Why does the shift in the IS curve not equal the change in the equilibrium level of income? Describe what happens to the AD curve when you make this change in the IS curve, and graph the new AD curve with the old one.
- i. Suppose instead that the fed increases the money supply from 1,000 to 1,200, leaving government spending at 150. Do we move along or shift the IS and LM curves? What is the new equilibrium interest rate and what is the new level of income? Describe what happens to the AD curve when you make this change in the money supply, and graph the new AD curve with the old one.