Lecture 4 - Recommended Problems

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☆☆☆ Problem 2, Chapter 5

Consider first the goods market model with constant investment that we saw in Chapter 3. Consumption is given by:

$$C = c_0 + c_1 (Y - T)$$
and I, G, **and** T **are given.**

a. Solve for equilibrium output. What is the value of the multiplier for a change in autonomous spending?

   Now let investment depend on both sales and the interest rate:

$$I = b_0 + b_1 Y - b_2 i$$

b. Solve for equilibrium output using the methods learned in Chapter 3. At a given interest rate, why is the effect of a change in autonomous spending bigger than what it was in part (a)? Why? (Assume $c_1 + b_1 < 1$.)

c. Suppose the central bank chooses an interest rate of $\bar{i}$. Solve for equilibrium output at that interest rate.

d. Draw the equilibrium of this economic using an IS/LM diagram.

☆☆☆ Problem 3, Chapter 5

The response of the economy to fiscal policy.

a. Using an IS/LM diagram, show the effect on output of a decrease in government spending. Can you tell what happens to investment? Why?

   Now consider the following IS/LM model:

$$\begin{aligned} C &= c_0 + c_1 (Y - T) \\ I &= b_0 + b_1 Y - b_2 i \\ Z &= C + I + G \\ i &= \bar{i} \end{aligned}$$

b. Solve for equilibrium output when the interest rate is $\bar{i}$. Assume $c_1 + b_1 < 1$. (Hint: You may want to rework through Problem 2 if you are having trouble with this step).

c. Solve for equilibrium level of investment.

d. Let's go behind the scene in the money market. Use the equilibrium in the money market $M/P = d_1 Y - d_2 i$ to solve for the equilibrium level of the real money supply when $i = \bar{i}$. How does the real money supply vary with government spending?

☆☆ Problem 11, Chapter 5

Consumption, investment, and the recession of 2001

This question asks you to examine the movements of investment and consumption before, during and after the recession of 2001. It also asks you to consider the events of September 11, 2001.

Go to the website of the Bureau of Economic Analysis (`www.bea.gov`). Find the NIPA tables, in particular the quarterly versions of Table 1.1.1, which shows the percentage change in real GDP and its components, and Table 1.1.2, which shows the contribution of the components of GDP to the overall percentage change in GDP. Table 1.1.2 weighs the percentage change of the components by their size. Investment is more variable than consumption, but consumption is much bigger than investment, so smaller percentage changes in consumption can have the same impact on GDP as much larger percentage changes in investment. Note that the quarterly percentage changes are annualized (i.e. expressed as annual rates). Retrieve the quarterly data on real GDP, consumption, gross private domestic investment, and nonresidential fixed investment for years 1999 to 2002 from Tables 1.1.1 and 1.1.2.

a. Identify the quarters of negative growth in 2000 and 2001.

b. Track consumption and investment around 2000 and 2001. From Table 1.1.1 which variable has the bigger percentage change around this time? Compare nonresidential fixed investment with overall investment. Which variable had the bigger percentage change?

c. From Table 1.1.2, get the contribution to GDP growth of consumption and investment for 1999 to 2001. Calculate the average of the quarterly contributions for each variable for each year. Now calculate the change in the contribution of each variable for 2000 and 2001 (i.e., subtract the average contribution of consumption in 1999 from the average contribution of consumption in 2000, subtract the average contribution of consumption in 2000 from the average contribution of consumption in 2001, and do the same for investment in both years.) Which variable had the largest decrease in its contribution to growth? What do you think was the proximate cause of the recession of 2001? (Was it a fall in investment demand or a fall in consumption demand?)

d. Now look at what happened to consumption and investment after the events of September 11th in the third and fourth quarters of 2001 and in the first two quarters of 2002. Does the drop in investment at the end of 2001 make sense to you? How long did this drop in investment last? What happened to consumption about this time? How do you

explain, in particular, the change in consumption in the fourth quarter of 2001? Did the events of September 11, 2001 cause the recession of 2001? Use the discussion in the chapter and your own intuition as guides in answers these questions.

☆ Problem 5, Chapter 5

Consider the following numerical example of the IS/LM model:

$$\begin{aligned} C &= 200 + 0.25Y_D \\ I &= 150 + 0.25Y - 1000i \\ G &= 250 \\ T &= 200 \\ \bar{i} &= .05 \end{aligned}$$

a. Derive the IS relation. (Hint: You want an equation with Y on the left side and everything else on the right.)

b. The central bank sets an interest rate of 5%. How is that decision represented in the equations?

c. What is the level of the real money supply when the interest rate is 5%? Use the expression:

$$(M/P) = 2Y - 8000i$$

d. Solve for the equilibrium value of C and I, and verify the value you obtained for Y by adding C, I, and G.

e. Now suppose that the central bank cuts the interest rate to 3%. How does this change the LM curve? Solve for Y, I, and C, and describe in words the effects of an expansionary monetary policy. What is the new equilibrium value of M/P supply?

f. Return to the initial situation in which the interest rate set by the central bank is 5%. Now suppose that governent spending increases to $G = 400$. Summarize the effects of an expansionary fiscal policy on Y, I, and C. What is the effect of the expansionary fiscal policy on the real money supply?