Lecture 2 - Recommended Problems

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☆☆☆ Problem 5, Chapter 3

In this chapter, we have assumed that the fiscal policy variables G and T are independent of the level of income. In the real world, however, that is not the case. Taxes typically depend on the level of income and so tend to be higher when income is higher. In this problem, we examine how this automatic response of taxes can help reduce the impact of changes in autonomous spending on output.

Consider the following behavioral equations:

$$C = c_0 + c_1 Y_D$$
$$T = t_0 + t_1 Y$$
$$Y_D = Y - T$$

G and I are both constant. Assume that t_1 is between 0 and 1.

a. Solve for the equilibrium output.

b. What is the multiplier? Does the economy respond more to changes in autonomous spending when t_1 is 0 or when t_1 is positive? Explain.

c. Why is fiscal policy in this case called an automatic stabilizer?

☆☆☆ Problem 6, Chapter 3

It is often argued that a balanced budget amendment would actually be destabilizing. To understand this argument, consider the economy in Q3-5.

a. Solve for equilibrium output.

b. Solve for taxes in equilibrium.

Suppose that the government starts with a balanced budget and that there is a drop in c_0.

c. What happens to Y? What happens to taxes?

d. Suppose that the government cuts spending in order to keep the budget balanced. What will be the effect on Y? Does the cut in spending required to balance the budget counteract or reinforce the effect of the drop in c_0 on output? (Don't do the algebra. Use your intuition and give the answer in words.)

☆☆☆ Problem 7, Chapter 3

Recall that we define taxes, T, as net of transfers. In other words,

$$T = \textbf{Taxes} - \textbf{Transfer Payments}$$

a. Suppose that the government increases transfer payments to private households, but these transfer payments are not financed by tax increases. Instead, the government borrows to pay for the transfer payments. Show in a diagram (similar to Figure 3-2) how this policy affects equilibrium output. Explain.

b. Suppose instead that the government pays for the increase in transfer payments with an equivalent increase in taxes. How does the increase in transfer payments affect equilibrium output in this case?

c. Now suppose that the population includes two kinds of people: those with high propensity to consume and those with low propensity to consume. Suppose the transfer policy increases taxes on those with low propensity to consume to pay for transfer to people with high propensity to consume. How does this policy affect equilibrium output?

d. How do you think the propensity to consume might vary across individuals according to income? In other words, how do you think the propensity to consume compares for people with high income and people with low income? Explain. Given your answer, do you think tax cuts will be more effective at stimulating output when they are directed toward high-income or toward low-income taxpayers?

☆☆ Problem 4, Chapter 3

The balanced budget multiplier.
For both political and macroeconomic reasons, governments are often reluctant to run budget deficits. Here, we examine whether policy changes in G and T that maintain a balanced budget are macroeconomically neutral. Put another way, we examine whether it is possible to affect output through changes in G and T so that the government budget remains balanced. Start from equation (3.8).

a. By how much does Y increase when G increase by one unit?

b. By how much does Y decrease when T increases by one unit?

c. Why are your answers to parts a and b different?

Suppose that the economy starts with a balanced budget $G = T$. If the increase in G is equal to the increase in T, then the budget remains in balance. Let us now compute the balanced budget multiplier.

d. Suppose that G and T increase by one unit each. Using your answers to parts a and b, what is the change in equilibrium GDP? Are balanced budget changes in G and T macroeconomically neutral?

e. How does the specific value of the propensity to consume affect your answer to part a? Why?

☆☆ Problem 8, Chapter 3

This problem examines the implications of allowing investment to depend on output. Chapter 5 carries this analysis much further and introduces an essential relation—the effect of the interest rate on investment—not examined in this problem.

a. Suppose the economy is characterized by the following behavioral equations:

$$C = c_0 + c_1 Y_D$$
$$Y_D = Y - T$$
$$I = b_0 + b_1 Y$$

Government spending and taxes are constant. Note that investment now increases with output. (Chapter 5 discusses the reasons for this relation.) Solve for equilibrium output.

b. What is the value of the multiplier? How does the relation between investment and output affect the value of the multiplier? For the multiplier to be positive, what condition must $(c_1 + b_1)$ satisfy? Explain your answers.

c. What would happen if $(c_1 + b_1) > 1$? (Trick question. Think about what happens in each round of spending.)

d. Suppose that the parameter b_0, sometimes called *business confidence*, increases. How will equilibrium output be affected? Will investment change by more or less than the change in b_0? Why? What will happen to national saving?

☆☆ Problem 9, Chapter 3

You should be able to complete this question without doing any algebra, although you may find making a diagram helpful for part a. For this problem, you do not need to calculate the magnitudes of changes in economic variables—only the direction of change.

a. Consider the economy described in Problem 8 (Q3-8 above). Suppose that consumers decide to consume less (and therefor to save more) for any given amount of disposable income. Specifically, assume that consumer confidence (c_0) falls. What will happen to output?

b. As a result of the effect on output you determined in part a, what will happen to investment? What will happen to public saving? What will happen to private saving? Explain. (*Hint*: Consider the savings-equals-investment characterization of equilibrium.) What is the effect on consumption?

c. Suppose that consumers had decided to increase consumption expenditure, so that c_0 had increased. What would have been the effect on output, investment, and private saving in this case? Explain. What would have been the effect on consumption?

d. Comment on the following logic: "When output is too low, what is needed is an increase in demand for goods and services. Investment is one component of demand, and saving equals investment. Therefore, if the government could just convince households to attempt to save more, then investment, and output, would increase."

☆ Problem 10, Chapter 3

Using fiscal policy in this first (and simplest) model to avoid the recession of 2009:
GDP in 2009 was roughly \$15,000 billion (aka \$15 trillion). You learned in Chapter 1 that GDP fell by approximately 3 percentage points in 2009.

a. How any billion dollars is 3 percentage points of \$15,000 billion?

b. If the propensity to consume were 0.5, by how much would government spending have to have increased to prevent a decrease in output?

c. If the propensity to consume were 0.5, by how much would taxes have to have been cut to prevent any decrease in output?

d. Suppose Congress had chosen to both increase government spending and raise taxes by the same amount in 2009. What increase in government spending and taxes would have been required to prevent the decline in output in 2009?