

1. Suppose that the economy is characterised by the following behavioural equations:

$$C = 160 + 0.6YD$$

$$I = 150$$

$$G = 150$$

$$T = 100$$

Solve for the following variables.

- a. Equilibrium GDP ( $Y$ ).
  - b. Disposable income ( $YD$ ).
  - c. Consumption spending ( $C$ ).
2. Assume the economy is the same as in Problem 1.
- a. Solve for equilibrium output. Compute total demand. Is it equal to production? Explain
  - b. Assume that  $G$  is now equal to 110. Solve for equilibrium output. Compute total demand. Is it equal to production? Explain.
  - c. Assume that  $G$  is equal to 110, so the output is given by your answer to (b). Compute private plus public saving. Is the sum of private and public savings equal to investment? Explain.
3. 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.
- a. By how much does  $Y$  increase when  $G$  increases by one unit?
  - b. By how much does  $Y$  decrease when  $T$  increases by one unit?
  - c. Why are your answers to (a) and (b) different?

Suppose that the economy starts with a balanced budget:  $G = T$ . If the increase in  $G$  equals 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 (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 (a)? Why?

4. So far in this chapter, we have assumed that the fiscal policy variables  $G$  and  $T$  are independent of income level. In the real world, however, this 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 behavioural equations:

$$C = C_0 + c_1 YD$$

$$T = t_0 + t_1 Y$$

$$YD = Y - T$$

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

- a. Solve for equilibrium output.
  - b. What is the multiplier? Does the economy respond more to changes in autonomous spending when  $t_1$  is zero or when  $t_1$  is positive? Explain.
  - c. Why is fiscal policy, in this case, called an 'automatic stabiliser'?
5. Recall that we define taxes,  $T$ , as net of transfers. In other words,

$$T = \text{taxes} - \text{transfer payments}$$

- a. Suppose that the government increases transfer payments to private households, but tax increases do not finance these transfer payments. Instead, the government borrows to pay for the transfer payments. Show in a diagram 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 a high propensity to consume and those with a low propensity to consume. Suppose the transfer policy increases taxes on those with a low propensity to consume to pay for transfers to people with a 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 directed towards high-income or low-income taxpayers?

6. *This problem examines the implications of allowing investment to depend on output. Chapter 5 takes 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 following behavioural equations characterise the economy:*

$$C = c_0 + c_1 YD$$

$$YD = Y - T$$

$$I = b_0 + b_1 Y$$

- b. *Government spending and taxes are constant. Note that investment now increases with output. Solve for equilibrium output.*
- c. *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.*
- 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 savings?*

7. *The GDP fell by € 104.94.*

- a. *If the propensity to consume were 0.5, how much would government spending have to have increased to prevent a decrease in output?*
- b. *If the propensity to consume were 0.5, how much would taxes have been cut to prevent any decrease in output?*
- c. *Suppose the government had chosen to increase government spending and raise taxes by the same amount. What increase in government spending and taxes would have been required to prevent the decline in output?*

#### **ADDITIONAL QUESTIONS:**

1. *Label each of the following statements true, false or uncertain. Explain briefly*
- a. *In most cases, the most significant component of GDP is consumption.*
- b. *The propensity to consume has to be positive, but otherwise, it can take on any positive value.*
- c. *Fiscal policy describes the choice of government spending and taxes and is treated as exogenous in our goods-market model.*
- d. *The equilibrium condition for the goods market states that consumption equals output.*
- e. *An increase of one unit in government spending leads to an increase of one unit in equilibrium output.*
- f. *An increase in the propensity to consume leads to a decrease in output.*