Table 20-1	UK consumption and income, 1992–2002, £ bn, at constant 1995 prices	
Year	Households' final consumption expenditure	Real households' disposable income
1992	476 834	522 915
1993	490 594	537 310
1994	505.711	545 269
1995	514 042	557 940
1996	532 735	571 440
1997	552 138	595 043
1998	573 873	596 745
1999	599 185	616 235
2000	626 537	654 649
2001	645 981	685 263
2002	668 994	695 183?

Source: Economic Trends Annual Supplement, UK National Accounts.

you drew in (c)? Do it, and measure its approximate slope.

(g) Assuming this to be a sensible estimate of the marginal propensity to save, what does this imply for the value of the multiplier?

2 Table 20–2 shows some data on consumption and income (output) for the economy of Hypothetica. Planned investment is autonomous and occurs at the rate of H$60 bn per period.

(a) Calculate savings and aggregate demand at each level of income.

(b) For each level of output, work out the unplanned change in inventory holdings and the rate of actual investment.

(c) If, in a particular period, income turned out to be H$100 bn, how would you expect producers to react?

(d) If, in a particular period, income turned out to be H$350 bn, how would you expect producers to react?

(e) What is the equilibrium level of income?

(f) What is the marginal propensity to consume?

(g) If investment increased by H$15 bn, what would be the change in equilibrium income?

3 (a) Using the data of Exercise 2, use graph paper to plot the consumption function and aggregate demand schedule.

(b) Add on the 45° line and confirm that equilibrium occurs at the same point suggested by your answer to 2(e) above.

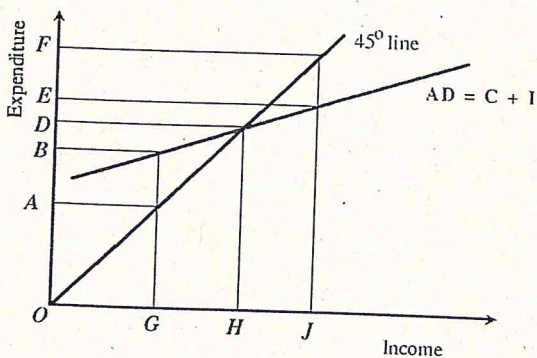(c) Show the effect on equilibrium of an increase in investment of $15 bn.

4 (a) Again using the data on Hypothetica from Exercise 2, use graph paper to plot how savings vary with income.

(b) Add on the investment line and confirm that equilibrium again occurs at the same income level.

(c) Show that an increase in investment of $15 bn leads to a new level of equilibrium income.

(d) Explain the process by which this new equilibrium is attained.

5 Figure 20–1 (overleaf) shows the aggregate demand schedule for an economy, together with the 45° line.

(a) Suppose output is OG: identify the level of aggregate demand and specify whether there is excess demand or excess supply.

(b) What is the size of the unplanned inventory change with output OG?

Table 20-2	Income and consumption in Hypothetica (all in Hypothetical $ bn)					
Income (output)	Planned consumption	Planned investment	Savings	Aggregate demand	Unplanned inventory change	Actual investment
50	35					
100	70					
150	105					
200	140					
250	175					
300	210					
350	245					
400	280					

Figure 20-1 The income-expenditure diagram

(c) How will firms respond to this situation?
(d) Identify equilibrium income and expenditure.
(e) Suppose output is OJ: identify the level of aggregate planned expenditure and specify whether there is excess demand or excess supply.
(f) What is the size of the unplanned inventory change with output OJ – and how will firms react to it?

6 Figure 20-2 shows autonomous investment for an economy, together with the savings function showing how savings vary with income. I_B is the initial level of investment.

Figure 20-2 Savings and investment
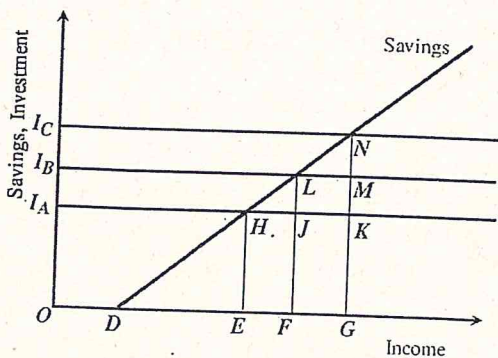
(a) Identify the initial equilibrium levels of income and savings.
(b) Which level of investment represents the effect of an increase in business confidence – a surge in optimistic animal spirits?
(c) What is the new equilibrium level of income?
(d) What is the multiplier?
(e) Which level of investment shows an increase in pessimism on the part of firms?
(f) What would be the new equilibrium level of income?

7 Consider a closed economy with no government sector in which consumption (C) is related to income (Y) by the equation:

$$C = A + cY$$

(a) What is the marginal propensity to consume?
(b) How is the level of savings related to income in this economy?

Suppose that $A = 400$, $c = 0.75$ and the level of investment is 500:

(c) At what level of national income would savings be zero?
(d) What would be the equilibrium level of income?

8 Figure 20-3 represents a closed economy with no government sector. At the equilibrium level of income, how would you interpret:
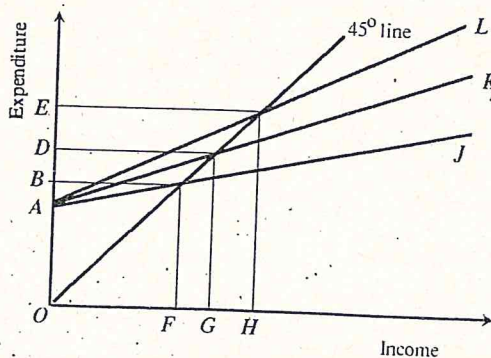
(a) XY/UX
and
(b) WY/OW?

Figure 20-3 A closed economy with no government
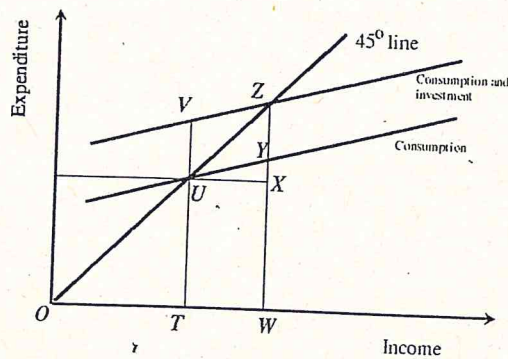
9 Figure 20-4 shows an economy which initially has an aggregate demand schedule given by AK.

Figure 20-4 Equilibrium and the marginal propensity to consume

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11 A calculation of the government budget deficit under the assumption of full employment: a cyclically-adjusted indicator of fiscal stance.

12 The use of active fiscal policy in response to economic conditions.

Exercises

1 Table 21-1 carries us back to the kingdom of Hypothetica, which we visited in Chapter 21. As then, planned consumption is 70 per cent of disposable income, but now the government imposes net taxes amounting to 20 per cent of gross income. Planned investment is still $60 billion and the government plans to spend $50 billion.
   (a) For each level of income in Table 21-1, calculate disposable income, planned consumption, savings, and net taxes.
   (b) Calculate aggregate demand, showing it at each level of aggregate supply.
   (c) If, in a particular period, income turned out to be $350 billion, how would you expect producers to react?
   (d) What is the equilibrium level of income?
   (e) Calculate the government budget deficit at equilibrium income.

   Suppose government expenditure is increased by $22 billion:
   (f) What is the new equilibrium income?

   (g) Calculate the government budget deficit at this new equilibrium position.
   (h) What is the value of the multiplier?

2 (a) Using the data of exercise 1, plot the consumption function and aggregate demand schedule.
   (b) Add on the 45° line and confirm that equilibrium occurs at the same point suggested by your answers to 1(d) above.
   (c) Show the effect on equilibrium income of an increase in government spending of $22 billion.

3 This exercise concerns the multiplier under different circumstances in a closed economy with and without government. Consumption is determined as 80 per cent of the income available to households. Investment is autonomous at a level of 450, as shown in Table 21-2.
   (a) Calculate consumption 1 and aggregate demand 1, assuming there is no government.
   (b) What is the equilibrium level of income?
   (c) What would be equilibrium income if investment increased by 50?
   (d) Calculate the value of the multiplier.

   Suppose now that the government levies direct taxes of 10 per cent of income and undertakes expenditure of 250, with investment back at 450:
   (e) Calculate disposable income, consumption 2, and aggregate demand 2.
   (f) What is the equilibrium level of income?
   (g) What is the size of the government budget deficit?

Table 21-1   Government comes to Hypothetica (All values in Hypothetical $ billion)

Income/output	Disposable income	Planned consumption	Planned investment	Government spending	Savings	Net taxes	Aggregate demand
50							
100							
150							
200							
250							
300							
350							
400							

Table 21-2   The multiplier with and without government

Income/output	Consumption 1	Investment	Aggregate demand 1	Disposable income	Consumption 2	Government spending	Aggregate demand 2
2000		450					
2250		450					
2500		450					
2750		450					
3000		450					

(h) Use your answers to parts (b), (e), and (f) to explain the balanced budget multiplier.

(i) What would equilibrium income be if investment increased by 70?

(j) Calculate the value of the multiplier.

4 The government in an economy undertakes expenditure on goods and services of £100 million and makes transfer payments amounting to 10 per cent of national income. The rate of direct taxation is 30 per cent.

(a) Draw a diagram showing autonomous government expenditure and the way in which net taxes vary with national income.

(b) At what level of income does the government have a balanced budget?

(c) Within what range of income does the government run a budget deficit?

(d) Within what range of income does the government run a budget surplus?

(e) What would be the government deficit/surplus if equilibrium income were £400 million?

(f) If full-employment income is £750 million, what is the full-employment budget?

5 A government has £100 billion of outstanding debt, on which it must make interest payments at the current nominal rate of 8 per cent. Inflation is running at 6 per cent per annum.

(a) Nominal interest payments are included in government expenditure and thus contribute to the government deficit. What is the nominal interest burden?

(b) What is the real interest rate? (*Note*: this was discussed in Chapter 12.)

(c) What is the real interest burden?

(d) If you have followed this line of reasoning through, you may feel suspicious that we have just been manipulating the figures. After all, holders of government bonds must be paid their (nominal) 8 per cent return. How in practice will the government be able to meet the payments?

6 An economy exports £150 million worth of goods each period, this quantity being autonomous. Imports, however, vary with national income such that imports always comprise 20 per cent of income.

(a) Draw a diagram which shows imports and exports against national income.

(b) What is the trade balance when income is £1000 million?

(c) What is the trade balance when income is £500 million?

(d) At what level of income are imports equal to exports?

(e) If full-employment income is £1000 million, explain how the balance of trade may act as a constant on government policy.

7 This exercise explores the balanced budget multiplier in a closed economy. Investment expenditure is fixed at 450, consumption is 80 per cent of

disposable income. Initially, government expenditure is 250 and direct taxes are 10 per cent of income.

(a) Identify the initial equilibrium income for the economy.

(b) Calculate the amount of consumption expenditure, tax revenue, and the government budget deficit/surplus.

Suppose now that government expenditure is increased by 500 and the tax rate raised from 10 to 25 per cent.

(c) Before output has had time to adjust, by how much is disposable income reduced?

(d) Calculate the resulting change in consumption expenditure and the net effect on aggregate demand, remembering the increase in government expenditure.

(e) What is the new equilibrium income level for the economy?

(f) What is the government budget deficit/surplus?

(g) Calculate the balanced budget multiplier.

8 Figure 21-1 shows aggregate demand schedules with and without foreign trade, together with the 45° line.

(a) AB and CD represent aggregate demand schedules with and without foreign trade. (Assume that imports are proportional to income, but exports are autonomous.) Which is which?

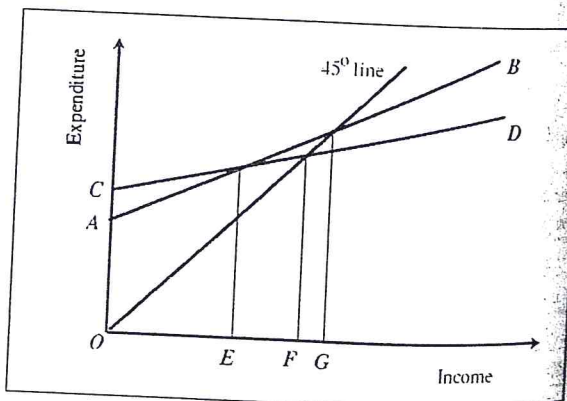(b) Identify equilibrium income in the absence of foreign trade.
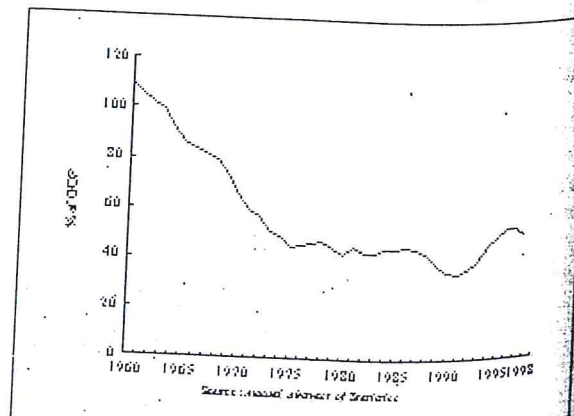

Figure 21-1   Equilibrium in an open economy

Figure 21-2   UK national debt as a percentage of GDP

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