



with emergency situations, such as natural disasters, financial crises and even military actions. If the government debt is too big, the government will have fewer fiscal options available. For example, following the financial crisis of 2008, the US government had a total debt to GDP ratio of around 68%. This meant that the government was able to respond to the crisis by reducing taxes and increasing spending. Whether this would be possible, with much higher debt to GDP ratios is a matter of debate.

What is the multiplier effect?

If a government decides to fill a deflationary gap by increasing its own spending, the final increase in aggregate demand will actually be greater than the amount of spending. In fact, any increase in aggregate demand will result in a proportionately larger increase in national income. This is explained by the *multiplier effect*. In order to understand this concept, it is necessary to remember the concepts of injections and withdrawals introduced in Chapters 1 and 13.

Government spending and business investment are injections into the circular flow of income and any injections are multiplied through the economy as people receive a share of the income and then spend a part of what they receive.

For example, a government spends \$100 million on a school building project. This \$100 million goes to a vast number of people for the factors of production that they provide. The money goes as income for the labour provided by people such as architects, engineers, builders, electricians, plumbers and designers. The providers of the capital and raw materials such as concrete, steel, minerals, water and electricity also receive a share of this spending. So, \$100 million ends up as income in the pockets of people who provide the factors of production for the building project.

What do the people do with this income? Some of it goes back to the government as taxes, some of it is saved, some of it is spent on foreign goods and services and the rest is spent on domestically produced goods and services. You should recognize the first three options as withdrawals from the circular flow of income. The money that is spent goes as income to a new set of recipients, who then behave in the same way – they pay some in taxes, some is saved, some is spent on imports and the rest is spent on domestic goods and services. During each “round”, some income is withdrawn from the circular flow and some stays to be re-spent.

Consider this simplified numerical example. The government spends \$100 million in an economy. In the economy, the average behaviour is observed as follows: 20% of all additional income goes to taxes, 10% is saved, and 10% is used to buy imports of goods and services. This means that the remaining income, which represents 60% of all additional income, is spent on domestic goods and services. This is known as the

Exercise 17.2

ATL Thinking and Communication

Here is an example of two questions and answers:

Question (a): Calculate the multiplier for an economy where the marginal propensity to consume is 0.75.

Answer: The multiplier = $\frac{1}{1 - 0.75} = \frac{1}{0.25} = 4$.

Question (b): By how much will national income increase in total if there is an investment of \$50,000?

Answer: An investment of \$50,000 will result in a final increase in national income of $4 \times \$50,000 = \$200,000$.

Showing your workings, answer the following questions:

1. An economy has a marginal propensity to consume of 0.8. Calculate:
 - a) its marginal propensity to withdraw
 - b) its multiplier
 - c) the amount of injections that would be needed if national income is to rise by \$10 million.
2. In a country, the marginal propensity to save is 0.1, the marginal rate of taxation is 0.3, and the marginal propensity to import is 0.1. How will the value of the multiplier change if the government lowers taxes, such that the marginal rate of taxation drops to 0.2?

marginal propensity to consume (MPC) and is expressed as a decimal. In this particular economy the MPC is 0.6.

When the government spends its \$100 million, it goes to people such as architects, plumbers, engineers, electricians, providers of raw materials etc. They pay \$20 million in taxes, \$10 million leaks from the circular flow as savings and \$10 million is spent on imports. The rest, \$60 million, is spent. They spend it on a wide range of things such as food, clothing, entertainment, books and car repairs, and the recipients of this \$60 million behave in the same way, with 40% leaving the circular flow and 60% remaining to be re-spent as other people's income.

Table 17.2 illustrates the rounds of spending and re-spending.

Initial spending by government in \$millions	100.00
2nd round of spending = 60% of 100	60.00
3rd round of spending = 60% of 60	36.00
4th round of spending = 60% of 36	21.60
5th round of spending	12.96
6th round of spending	7.78
7th round of spending	4.67
8th round of spending	2.80
9th round of spending	1.68
10th round of spending	1.01
11th round of spending	0.60
12th round of spending	0.36
13th round of spending	0.22
14th round of spending	0.13
15th round of spending	0.08
16th round of spending	0.05
17th round of spending	0.03
18th round of spending	0.02
19th round of spending	0.01
20th round of spending	0.01
Total spending, including initial spending by government	\$249.99m

▲ **Table 17.2** The multiplier effect

The final addition to national income, when all the money has been spent and re-spent, amounts to \$250 million, ie 2.5 times the original government spending of \$100 million. In this example, the multiplier is equivalent to the value 2.5. Any injection into the circular flow of this economy would contribute 2.5 times its amount to national income.

Rather than complete a rather complicated table to find the value of the multiplier, there are formulas that can be used. The value of the multiplier can be calculated by using either the marginal propensity to consume (mpc) or the value of the marginal propensity to withdraw (mpw). The mpw is the value of the marginal propensity to save (mps) plus the marginal rate of taxation (mrt) plus the marginal propensity to import (mpm).



Formulas:

$$\text{The multiplier} = \frac{1}{1 - \text{mpc}} \text{ OR } \frac{1}{\text{mps} + \text{mpm} + \text{mrt}} = \frac{1}{\text{mpw}}$$

From the example above, where the $\text{mpc} = 0.6$, the multiplier is:

$$\frac{1}{1 - 0.6} = \frac{1}{0.4} = 2.5$$

or

the $\text{mps} = 0.1$, $\text{mrt} = 0.2$, and the $\text{mpm} = 0.1$, the multiplier is:

$$\frac{1}{0.1 + 0.2 + 0.1} = \frac{1}{0.4} = 2.5$$

Any change in any of the withdrawals from the circular flow will result in a change in the economy's multiplier. If the taxation rate increases, for example, then the value of the multiplier will fall. If the marginal propensity to import falls, then there will be an increase in the multiplier.

If a government is planning to intervene to try to fill a deflationary gap, it must have some idea of two things. First, it must try to estimate the gap between equilibrium output and full employment output. Second, it must have some estimate of the value of the multiplier so as to be able to judge the suitable increase in aggregate demand that is necessary to inject into the economy in order to fill the gap. The difficulties in estimating both of these values illustrate one of the limitations of government fiscal policy aimed at managing aggregate demand in the economy.

What is monetary policy?

Monetary policy is defined as the set of official policies governing the supply of money and the level of interest rates in an economy. Governments use *expansionary monetary policy* to increase aggregate demand and *contractionary, or deflationary, monetary policy* to reduce aggregate demand.

In any economy, there is a vast array of different interest rates. Advertisements offering low mortgage rates or "competitive financing" are examples of the interest rates offered by private profit-making businesses, such as commercial banks. Although banks are regulated by the government, they are mainly free to set these rates themselves.

When we talk about interest rates as a tool of monetary policy we are talking about the *base rate (discount rate or prime rate)* that is set by a country's *central bank*. The central bank is not a private profit-making bank but is essentially the government's bank and the ultimate authority in control of the money supply in an economy. In some countries the government controls the central bank, but in most industrialized countries these days the central bank is an independent body with the primary responsibility of maintaining a low and stable rate of inflation in the economy. Changes in the central bank's base rate ultimately impact upon all borrowing and lending in the economy and are an