

CASE STUDY

Why Do Parents Leave Bequests?

The debate over Ricardian equivalence is partly a debate over how different generations are linked to one another. Robert Barro's defence of the Ricardian view is based on the assumption that parents leave their children bequests because they care about them. But is altruism really the reason that parents leave bequests?

One group of economists has suggested that parents use bequests to control their children. Parents often want their children to do certain things for them, such as phoning home regularly and visiting on holidays. Perhaps parents use the implicit threat of disinheritance to induce their children to be more attentive.

To test this 'strategic bequest motive', these economists examined data on how often children visit their parents. They found that the more wealthy the parent, the more often the children visit. Even more striking was another result: only wealth that can be left as a bequest induces more frequent visits. Wealth that cannot be bequeathed, such as pension wealth which reverts to the pension company in the event of an early death, does not encourage children to visit. These findings suggest that there may be more to the relationships among generations than mere altruism.⁶ ■

Making a Choice

Having seen the traditional and Ricardian views of government debt, you should ask yourself two sets of questions.

First, with which view do you agree? If the government cuts taxes today, runs a budget deficit and raises taxes in the future, how will the policy affect the economy? Will it stimulate consumption, as the traditional view holds? Or will consumers understand that their lifetime income is unchanged and, therefore, offset the budget deficit with higher private saving?

Second, why do you hold the view that you do? If you agree with the traditional view of government debt, what is the reason? Do consumers fail to understand that higher government borrowing today means higher taxes tomorrow? Or do they ignore future taxes, either because they are borrowing-constrained or because future taxes fall on future generations with which they do not feel an economic link? If you hold the Ricardian view, do you believe that consumers have the foresight to see that government borrowing today will result in future taxes levied on them or their descendants? Do you believe that consumers will save the extra income to offset that future tax liability?

We might hope that the evidence could help us decide between these two views of government debt. Yet when economists have examined macroeconomic data in order to analyse these issues, the results have been largely inconclusive. Nevertheless, it is probably true to say that most macroeconomists would not adhere to the proposition of Ricardian equivalence, strictly interpreted. The

⁶ B. Douglas Bernheim, Andrei Shleifer and Lawrence H. Summers, 'The Strategic Bequest Motive', *Journal of Political Economy*, 1985, vol. 93, pp. 1045–1076.

FYI

Ricardo on Ricardian Equivalence

David Ricardo was a millionaire stockbroker and one of the great economists of all time. His most important contribution to the field was his 1817 book, *Principles of Political Economy and Taxation*, in which he developed the theory of comparative advantage, which economists still use to explain the gains from international trade. Ricardo was also a member of the British Parliament, where he put his own theories to work and opposed the Corn Laws, which restricted international trade in grain.

Ricardo was interested in the alternative ways in which a government might pay for its expenditure. In an 1820 article called 'Essay on the Funding System', he considered an example of a war that cost £20 million. He noted that if the interest rate were 5 per cent, this expense could be financed with a one-time tax of £20 million, a perpetual tax of £1 million or a tax of £1.2 million for 45 years. He wrote:

In point of economy, there is no real difference in either of the modes; for twenty million in one payment, one million per annum forever, or 1,200,000 pounds for 45 years, are precisely of the same value.

Ricardo was aware that the issue involved the linkages among generations:

It would be difficult to convince a man possessed of 20,000 pounds, or any other sum, that a perpetual payment of 50 pounds per annum was equally burdensome with a single tax of 1000 pounds. He

would have some vague notion that the 50 pounds per annum would be paid by posterity, and would not be paid by him; but if he leaves his fortune to his son, and leaves it charged with this perpetual tax, where is the difference whether he leaves him 20,000 pounds with the tax, or 19,000 pounds without it?

Although Ricardo viewed these alternative methods of government finance as equivalent, he did not think other people would view them as such:

The people who pay taxes . . . do not manage their private affairs accordingly. We are apt to think that the war is burdensome only in proportion to what we are at the moment called to pay for it in taxes, without reflecting on the probable duration of such taxes.

Thus, Ricardo doubted that people were rational and far-sighted enough to look ahead fully to their future tax liabilities.

As a policy maker, Ricardo took seriously the government debt. Before the British Parliament, he once declared:

This would be the happiest country in the world, and its progress in prosperity would go beyond the powers of imagination to conceive, if we got rid of two great evils – the national debt and the corn laws.

It is one of the great ironies in the history of economic thought that Ricardo rejected the theory that now bears his name!

consensus view is probably that, while there may be *some* offsetting effects of tax changes due to the perceived effect on future tax liabilities, a combination of myopia and borrowing constraints is likely to prohibit full Ricardian equivalence.

16-5 Other Perspectives on Government Debt

The policy debates over government debt have many facets. So far we have considered the traditional and Ricardian views of government debt. According to the traditional view, a government budget deficit expands aggregate demand

and stimulates output in the short run, but crowds out capital and depresses economic growth in the long run. According to the Ricardian view, a government budget deficit has none of these effects, because consumers understand that a budget deficit represents merely the postponement of a tax burden. With these two theories as background, we now consider several other perspectives on government debt.

Balanced Budgets versus Optimal Fiscal Policy

Sometimes politicians argue that the government should run a balanced budget. Most economists, however, oppose a strict rule requiring the government to balance its budget. There are three reasons why optimal fiscal policy may at times call for a budget deficit or surplus.

Stabilization A budget deficit or surplus can help to stabilize the economy. In essence, a balanced-budget rule would revoke the automatic stabilizing powers of the system of taxes and transfers. When the economy goes into a recession, taxes automatically fall and transfers automatically rise. Although these automatic responses help to stabilize the economy, they push the budget into deficit. A strict balanced-budget rule would require that the government raise taxes or reduce spending in a recession, but these actions would further depress aggregate demand. Discretionary fiscal policy is more likely to move in the opposite direction over the course of the business cycle. In 2009, for example, US President Barack Obama signed a stimulus bill authorizing a large increase in spending to try to reduce the severity of the recession, even though it led to the largest budget deficit in more than half a century.

Tax Smoothing A budget deficit or surplus can be used to reduce the distortion of incentives caused by the tax system. As we discussed earlier, high tax rates impose a cost on society by discouraging economic activity. A tax on labour earnings, for instance, reduces the incentive that people have to work long hours. Because this disincentive becomes particularly large at very high tax rates, the total social cost of taxes is minimized by keeping tax rates relatively stable, rather than making them high in some years and low in others. Economists call this policy *tax smoothing*. To keep tax rates smooth, a deficit is necessary in years of unusually low income (recessions) or unusually high expenditure (wars).

Intergenerational Redistribution A budget deficit can be used to shift a tax burden from current to future generations. For example, some economists argue that if the current generation fights a war to preserve freedom, future generations benefit as well and should bear some of the burden. To pass on some of the war's costs, the current generation can finance the war with a budget deficit. The government can later retire the debt by levying taxes on the next generation.

Given that it is now more than 60 years since European countries were engaged in a major war, perhaps a more compelling argument for shifting tax burdens

over time is connected with public investment. If the government enhances the economy's infrastructure by building new roads, hospitals and schools, this is investment that will benefit future generations as well as the current generation of taxpayers, since the investments will last many years. Why, then, should the current generation foot the entire bill? Surely future generations should pay their share too? Also, since public investments may raise the future growth rate of the economy, future generations may be richer as a result, and so better able to pay their share of the investment. Hence, the government may wish to pass on some of the costs of public investment to future generations by using debt finance.

These considerations lead most economists to reject a strict balanced-budget rule. At the very least, a rule for fiscal policy needs to take account of the recurring episodes, such as recessions and wars, during which it is reasonable for the government to run a budget deficit; and may also distinguish between government expenditure on current goods and services, and expenditure on public investment, when analysing the budget deficit.

Fiscal Effects on Monetary Policy

We first discussed the possibility of a link between fiscal policy and monetary policy in Chapter 5. As we saw, one way for a government to finance a budget deficit is simply to print money – a policy that leads to higher inflation. Indeed, when countries experience hyperinflation, the typical reason is that fiscal policy makers are relying on the inflation tax to pay for some of their spending. The ends of hyperinflations almost always coincide with fiscal reforms that include large cuts in government spending, and therefore a reduced need for seigniorage.

In addition to this link between the budget deficit and inflation, some economists have suggested that a high level of debt might also encourage the government to create inflation. Because most government debt is specified in nominal terms, the real value of the debt falls when the price level rises. This is the usual redistribution between creditors and debtors caused by unexpected inflation – here the debtor is the government and the creditor is the private sector. But this debtor, unlike others, has access to the monetary printing press. A high level of debt might encourage the government to print money, thereby raising the price level and reducing the real value of its debts.

Despite these concerns about a possible link between government debt and monetary policy, there is little evidence that this link is important in most developed countries. Thus, although monetary policy might be driven by fiscal policy in some situations, such as during the classic hyperinflations, this situation appears not to be the norm in most countries today. There are several reasons for this. First, most governments can finance deficits by selling debt and do not need to rely on seigniorage. Second, central banks often have enough independence to resist political pressure for more expansionary monetary policy. Third, and most important, policy makers in all parts of government know that inflation is a poor solution to fiscal problems.

International Dimensions

Government debt may affect a nation's role in the world economy. As we first saw in Chapter 6, when a government budget deficit reduces national saving, it often leads to a trade deficit, which in turn is financed by borrowing from abroad. For instance, many observers have blamed US fiscal policy for the relatively recent switch of the United States from a major creditor in the world economy to a major debtor. This link between the budget deficit and the trade deficit leads to two further effects of government debt.

First, high levels of government debt may increase the risk that an economy will experience capital flight – an abrupt decline in the demand for a country's assets in world financial markets. International investors are aware that a government can always deal with its debt simply by defaulting. This approach was used as far back as 1335, when England's King Edward III defaulted on his debt to Italian bankers. More recently, several Latin American countries defaulted on their debts in the 1980s, and Russia did the same in 1998. In 2011, it seemed likely that Greece was heading towards that outcome as well (a topic we discuss in Chapter 20). The higher the level of the government debt, the greater the temptation of default. Thus, as government debt increases, international investors may come to fear default and curtail their lending. If this loss of confidence occurs suddenly, the result could be the classic symptoms of capital flight: a collapse in the value of the currency and an increase in interest rates. As we discussed in Chapter 13, this is precisely what happened to Mexico in the early 1990s when default appeared likely.

Second, high levels of government debt financed by foreign borrowing may reduce a nation's political clout in world affairs. This fear was emphasized by economist Ben Friedman in his 1988 book, *Day of Reckoning*. He wrote: 'World power and influence have historically accrued to creditor countries. It is not coincidental that America emerged as a world power simultaneously with our transition from a debtor nation . . . to a creditor supplying investment capital to the rest of the world.' Friedman suggests that if the United States continues to run large trade deficits, it will eventually lose some of its international influence. So far, the record has not been kind to this hypothesis: the United States has run trade deficits throughout the 1980s, 1990s and the first decade of the 2000s and, nonetheless, remains a leading superpower. But perhaps other events – such as the collapse of the Soviet Union – offset the fall in political clout that the United States would have experienced because of its increased indebtedness.

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Indexed Bonds

In a number of countries – including nine European countries – the government issues bonds that pay a return based on the consumer price index (CPI). These bonds pay a rate of interest linked to the overall price level as measured by the CPI. In addition, when the principal (the price of the bond when it is issued) is repaid, that amount is also adjusted for changes in the CPI. The interest paid

on the bonds, therefore, is a real interest rate. No longer do professors of macroeconomics need to define the real interest rate as an abstract construct. They can just look up the interest rate paid on indexed bonds. Looked at another way, indexed bonds also provide data on expected inflation: since the real interest rate is the nominal rate plus expected inflation, one way to measure the bond market's expected inflation rate is to look at the difference between the yield on nominal bonds and the yield on real bonds. This variable can also be useful for macroeconomic analysis, since many macroeconomic theories point to expected inflation as a key variable to explain the relationship between inflation and unemployment.

Table 16-2 lists the nine European countries that currently issue indexed bonds, as well as the year they first started issuing them and the price indices to which the bonds are linked.

TABLE 16-2**The European Countries that Issue Indexed Government Bonds**

Country	Year of First Issue	Index
France	1998	Domestic CPI minus tobacco
	2001	Euro Area CPI minus tobacco
Greece	1997	Domestic CPI
Germany	2003	Euro Area CPI minus tobacco
	2006	Euro Area CPI minus tobacco
Hungary	1995	CPI
Iceland	1964	CPI
Italy	2003	Euro Area CPI minus tobacco
Poland	1992	CPI
Romania	2003	CPI
Sweden	1994	CPI
UK	1981	RPI

Source: UK Debt Management Office.

Iceland has been issuing indexed bonds since 1964. The UK government began issuing them 17 years later, in 1981. Among the Euro Area countries, Germany and Italy currently issue bonds indexed to the Euro Area CPI (minus tobacco), while France and Greece issue bonds linked to this measure of Euro Area inflation and also bonds indexed to their national CPIs.

Note that indexed bonds are not confined to Europe, however: over 20 countries around the world issue indexed government bonds. The US began issuing them in 1997.

Indexed bonds benefit bondholder and taxpayer alike. They insulate both sides of the transaction from inflation risk. Bondholders should care about the real interest rate they earn, and taxpayers should care about the real interest rate

they pay. When government bonds are specified in nominal terms, both sides take on risk that is neither productive nor necessary. Indexed bonds eliminate this inflation risk.

Other reasons why issuing indexed bonds may be beneficial to government macroeconomic policy include the following. First, indexed bonds reduce the government's incentive to produce surprise inflation in order to reduce the real value of its debt. In contrast to other debtors, governments can print the money they need. The greater the government's nominal debts, the more incentive the government has to inflate away its debt. Issuing indexed debt reduces this potentially problematic incentive.

Second, investors may be willing to accept a lower average real interest rate on indexed debt because they are effectively being insured against inflation. Put another way, if there is a large risk of high inflation eroding the value of nominal debt, investors may demand very high interest rates in order to compensate them for this risk. The effect of issuing indexed bonds, which eliminates the inflation risk for the investor, may therefore be to lower the overall real borrowing costs of the government.

In effect, therefore, issuing indexed bonds allows a government the opportunity to send a message that they intend to stem the tide of inflation – an action that may also result in lower borrowing costs and potentially lower nominal interest rates. It is reasoning like this that made Iceland one of first issuers of indexed bonds: although Iceland has enjoyed low and fairly stable inflation rates that have compared well to those of other European countries since the 1990s, it had relatively high inflation during much of the 1960s, 1970s and 1980s. Similar reasoning underlay the issuance of indexed bonds in Hungary, Poland and Romania, when those countries were experiencing high inflation, as well as Brazil, Chile and Colombia, which began issuing them in the 1960s, and Israel, which began issuing them in 1955.

In the past, economists have proposed a variety of rules that could be used to conduct monetary policy, as we discussed in the preceding chapter. While the issuance of indexed bonds is typically not the major proportion of debt issued by European governments (in the UK, indexed bonds account for about 20 per cent of debt issued by central government), they do nevertheless expand the number of possible monetary policy rules. Here is one idea: the central bank announces a target for the inflation rate. Then, every day, the central bank measures expected inflation as the spread between the yield on nominal debt and the yield on indexed debt. If expected inflation is above the target, the central bank contracts the money supply. If expected inflation is below the target, the central bank expands the money supply. In this way, the central bank can use the bond market's inflation forecast to ensure that the money supply is growing at the rate needed to keep inflation close to its target.⁷ ■

⁷ To read more about indexed bonds, see John Y. Campbell and Robert J. Shiller, 'A Scorecard for Indexed Government Debt', *NBER Macroeconomics Annual*, 1996, pp. 155–197; and David W. Wilcox, 'Policy Watch: The Introduction of Indexed Government Debt in the United States', *The Journal of Economic Perspectives*, winter 1998, vol. 12, pp. 219–227.

16-6 Fiscal Sustainability, Budget Deficits and the Debt-to-GDP Ratio

From an economic point of view, a country is in some ways like a household or an individual, and in other ways it is quite different. One way in which individuals and countries differ is in the analysis of their debt. An individual's debt might be thought of as sustainable if it is feasible for the individual to repay the debt over his or her lifetime. This is why large loans to individuals, such as mortgage loans with which to purchase a house or a flat, are always backed by a claim on the property and based on an analysis of the individual's (or the household's) income, and are usually worked out so that the final payment on the mortgage can be made before the individual retires. An economy is slightly different in this respect. Since an economy in some sense lives forever and never retires, there is no reason why it should ever have to pay off its debts entirely. What is important for an economy is **fiscal sustainability**, which means that the government is able to service its debt (i.e. pay interest on the debt and honour capital repayments when they fall due). For this to be the case, the ratio of government debt to GDP must settle down at some constant level; in other words, government debt and GDP must grow at the same rate. If this is not the case, government debt will become a larger and larger multiple of GDP, and there must come a point at which the government is no longer able to service the debt.

We can formalize our analysis of fiscal sustainability with the help of a little algebra. If the nominal value of government debt is D , we can write an equation for changes in D as follows:

$$\Delta D = iD + G - T,$$

where i , G and T are the nominal interest rate on the debt, and the level of government purchases and tax revenue (expressed in nominal terms), respectively. This equation says that changes in government debt will be equal to interest paid on the debt (iD), plus the increase in debt arising from the excess of government purchases over tax revenue (we assume that the budget deficit is financed entirely by borrowing – as we discussed earlier, very little government spending in developed economies is financed by the seigniorage revenue from printing money).

Now the total budget deficit that a government runs is equal to the excess of government spending on goods and services over tax revenue, $G - T$, plus the interest payment that the government has to make on its debt, iD . Hence, the **total budget deficit** is defined as $B = iD + G - T$. Up until now, we have been referring to the simple excess of government expenditure over tax revenue, $G - T$, as the budget deficit. While this is standard usage, if we want to be more precise, we refer to the excess of government expenditure on goods and services over tax revenue as the **primary budget deficit**. Thus, the total budget deficit is equal to the primary budget deficit plus interest payments on the debt outstanding. Using this definition, our equation for the movements in government debt becomes simply $\Delta D = B$, and so growth in nominal debt must be given by

$$\frac{\Delta D}{D} = \frac{B}{D}.$$

For the level of debt to be sustainable, the ratio of nominal debt to nominal GDP, D/Y , must settle down at some long-run constant value (note that we are thinking of GDP, Y , in nominal or money terms here, since D is also in nominal terms). But if D/Y is a constant in equilibrium, then the numerator (D) and the denominator (Y) must be growing at the same rate. Long-run growth in nominal GDP, Y , will be equal to long-run growth in real GDP (which we analysed in detail in Chapters 8 and 9) plus the long-run rate of inflation. Suppose long-run real GDP growth is g (in Chapters 8 and 9, we determined that the long-run real GDP growth was $g + n$, which we are redefining here as g to keep the notation simple) and the long-run inflation rate is π . For long-run fiscal sustainability, we would need to set the growth in nominal debt equal to the sum of real GDP growth plus inflation:

$$\frac{\Delta D}{D} = g + \pi.$$

Thus, using the previous equation,

$$\frac{B}{D} = g + \pi,$$

and dividing both sides of this last equation by Y and rearranging, we then have

$$\frac{D}{Y} = \frac{1}{(g + \pi)} \frac{B}{Y}.$$

The term on the left-hand side of this equation is the equilibrium **debt-to-GDP ratio**. The equation tells us the stable equilibrium level towards which the debt-to-GDP ratio will head for a given level of nominal GDP growth (i.e. $g + \pi$) and a given total budget deficit as a proportion of GDP.

Note that having a constant equilibrium debt-to-GDP ratio is a necessary but not a sufficient condition for fiscal sustainability. This is because the formula is worked out assuming stable long-run growth, and does not allow for short-run shocks. Thus, an economy may have a constant equilibrium debt-to-GDP ratio according to this formula, and yet this debt-to-GDP ratio may be so large that when a sudden shock occurs – for example a negative supply shock that greatly reduces national income – the government may suddenly find itself unable to service the debt. For this reason, it is necessary to set the equilibrium debt-to-GDP ratio at a level that is thought to be prudent. This then allows us to solve for the appropriate budget deficit for which to aim. Suppose, for example, that a long-run debt-to-GDP ratio of d was thought to be prudent. Then we could solve our equation for the level of the budget deficit that will deliver this in the long run, given the long-run growth rate of GDP and the long-run inflation rate:

$$\frac{B}{Y} = (g + \pi)d.$$

This equation gives us the condition for fiscal sustainability in terms of the total budget deficit (including interest payments) as a proportion of GDP. It tells us that, for a given target long-run debt-to-GDP ratio d , the total budget deficit

may be higher for higher rates of nominal GDP growth, since this will tend to increase the denominator of the debt-to-GDP ratio, and so allow a higher accumulation of debt for a given debt-to-GDP ratio.

We can also get some insight into fiscal sustainability by looking at the *primary* budget deficit (remember that this is just the excess of government spending over tax revenue, $G - T$, and excludes interest payments on government debt). Rewriting our expression for fiscal sustainability using the definition of the total budget deficit (i.e. $B = iD + G - T$),

$$\frac{iD + G - T}{Y} = (g + \pi) \frac{D}{Y},$$

or, rearranging slightly,

$$\frac{G - T}{Y} = (g + \pi - i) \frac{D}{Y}.$$

But $(g + \pi - i) = (g - r)$, where r is the real interest rate, so this last expression can be written as

$$\frac{G - T}{Y} = (g - r) \frac{D}{Y}.$$

Again, suppose that we choose a 'prudent' level, d , for the equilibrium debt-to-GDP ratio. Then we have

$$\frac{G - T}{Y} = (g - r)d.$$

This equation gives us the condition for fiscal sustainability in terms of the *primary* budget deficit. In words, it says that, for fiscal sustainability, the primary deficit as a proportion of GDP must be equal to the excess of real GDP growth over the real interest rate times the equilibrium debt-to-GDP ratio.

Suppose, for example, that $g = r$. Then $g - r = 0$, implying that $G - T = 0$, and the expression implies that fiscal sustainability requires the primary budget to balance. This means that the government is not adding to the stock of debt through its expenditure, and the government can 'roll over' its debt interest without the debt-to-GDP ratio growing, because the real value of government debt will then grow exactly in line with real national income.⁸

⁸ Note that, when we analysed fiscal sustainability in terms of the total budget deficit, we found it convenient to think of the debt-to-GDP ratio as the ratio of *nominal* government debt to nominal GDP, while when analysing sustainability in terms of the primary deficit, we are implicitly thinking of the debt-to-GDP ratio as the ratio of the *real* value of government debt (which grows at the real rate of interest, r) to the *real* value of national income (which grows at the real rate of GDP growth, g). In fact, the ratio of two variables expressed in nominal terms is exactly the same as the ratio of the two corresponding real terms, because the price level cancels out. For example, if X and Z are two macroeconomic quantities expressed in nominal terms, then we can convert them to real terms by dividing them by the price level P , to get X/P and Z/P . But when we take the ratio of the real terms, $[X/P]/[Z/P]$, the P s cancel and so $[X/P]/[Z/P] = (X/Z)$. Thus, the ratio of nominal government debt to nominal GDP is the same as the ratio of real government debt to real GDP.

What if $g < r$? In that case, $g - r < 0$, and so fiscal sustainability requires $G - T < 0$, and the government must run a primary surplus for fiscal sustainability (i.e. $G < T$). This is because the real interest rate is greater than the rate of real GDP growth, and so the real value of the debt will rise faster than real income unless the government uses some of its tax revenue to pay the debt service, rather than spending it.

The third possible case is $g > r$, or $g - r > 0$, so that fiscal sustainability can be achieved with a primary budget deficit, $G - T > 0$. This is because the real value of national income is growing faster than the real value of public debt, so the government can afford to increase debt a little (by running a primary deficit) while still keeping the equilibrium debt-to-GDP ratio constant, so long as the resulting increase does not exceed the amount by which real growth exceeds the real interest rate.

You may wonder why we have set out two conditions for fiscal sustainability, one in terms of the total budget deficit and the other in terms of the primary budget deficit. If the two conditions are equivalent, you might reasonably point out, why not just use one of them and make everyone's life easier?

The simple answer is that, in practice, some policy makers talk about fiscal sustainability in terms of primary deficits and others talk about it in terms of total budget deficits. As a macroeconomist, you need to understand both these equivalent ways of viewing fiscal sustainability – and why they are equivalent.

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The Stability and Growth Pact: A Sneak Preview

In the next chapter, we shall discuss the economics of monetary union (i.e. adopting a single currency among a group of countries), including the implications for fiscal policy and the management of government debt. For now, however, we can get a sneak preview of what is to come, and at the same time see an application of our rules for fiscal sustainability.

At the outset of the European Economic and Monetary Union (EMU), a set of fiscal rules was drawn up and agreed to by EMU members. This set of rules was known as the Stability and Growth Pact (SGP). We will discuss the economic rationale for the SGP in the next chapter, but it is sufficient to note for now that the SGP laid down a rule that the *total* budget deficit of EMU member countries should not exceed 3 per cent of GDP per year. Where did this 3 per cent rule come from? It is in fact governed by our rule for fiscal sustainability.

According to the Treaty of Maastricht, candidates for entry into EMU should have a level of general government gross debt that is no more than 60 per cent of GDP.⁹ Effectively, therefore, the Maastricht Treaty set the 'prudent' debt-to-GDP ratio at 60 per cent. Given long-run European growth rates of the order of 2.5–3 per cent per year, and allowing for long-run inflation of 2–2.5 per cent per

⁹ Note the use of general government gross debt as the measure of public debt. In the event, at the outset of the EMU, several countries did not meet the 60 per cent debt-to-GDP ratio criterion (in Italy and Belgium the ratio exceeded 120 per cent), but they were still allowed to join on the grounds that they had taken significant steps to reduce their government debt.

year (as we discussed in Chapter 15, the European Central Bank has an inflation target of 2 per cent per year), the average Euro Area (Eurozone) country could presumably expect long-run nominal GDP growth of about 5 per cent a year. In terms of our fiscal arithmetic that we developed above, therefore, we have $x + \pi = 0.05$ and the equilibrium debt-to-GDP ratio, $d = 0.6$. Using the formula for fiscal sustainability in terms of the total budget deficit, $(B/Y) = (x + \pi) d$, we therefore have

$$\frac{B}{Y} = 0.05 \times 0.6,$$

which implies a maximum total budget deficit of 0.03, or 3 per cent – exactly as laid down in the Stability and Growth Pact. ■

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The ‘Golden Rule’ of UK Public Finance

The UK government announced in 1998 that, according to the guidelines of its *Code for Fiscal Stability*, it would adhere to two fiscal rules on its spending, the first of which it referred to as the *Golden Rule*. (Beware! The Golden Rule of public finance has nothing to do with the Golden Rule level of capital that we analysed in Chapter 8. The similarity in names is purely coincidental.)

The Golden Rule states that over the economic cycle, the government will borrow only to invest. This means that the cyclically adjusted budget deficit on current expenditure (i.e. the excess over tax revenue of government spending on current goods and services, not taking into account public investment) must balance or be in surplus.

On its own, however, the Golden Rule would allow the government to undertake huge amounts of public investment and run up correspondingly huge amounts of public debt. Hence, the Golden Rule is coupled with another rule, the *Sustainable Investment Rule*, which states that public sector net debt as a proportion of GDP will be held over the economic cycle at a stable and prudent level, which the government has defined as ‘below 40 per cent of GDP over the economic cycle’.¹⁰

The Golden Rule and its twin, the Sustainable Investment Rule, seem to be good fiscal rules. The Golden Rule allows for the current budget deficit (i.e. excluding investment) to vary over the business cycle, so that it can be used for macroeconomic stabilization, but it allows the costs of public investment to be spread over current and future generations, who will be the beneficiaries of the investment, rather than simply requiring the current generation to foot the bill. The Sustainable Investment Rule, meanwhile, ensures that the public debt does not get out of hand as a result of public investments financed by issuing government bonds.

Critics of these fiscal rules have argued that they are not as rigid as they seem, for two reasons. First, the Chancellor is free to define the economic or business

¹⁰ Note the use of public sector net debt as the measure of public debt by the UK authorities.

FYI

Ponzi Finance

Have you ever received an email or Facebook post that asked you to forward that message to several of your friends? These so-called *chain-letter schemes* may be a bit of a nuisance or just harmless fun. But you might receive one that asks you to send money, with the promise that within a few weeks you will receive large amounts of money from the ever-multiplying friends of the friends of the friends to whom the email has since been forwarded. As an economist, you should recognize that instances of getting something for nothing are rare, and this is no exception.

A chain-letter scheme is an example of a *Ponzi game*. It works by recruiting larger and larger numbers of people to send the cheques (or emails). Eventually, there will not be enough recruits and the process will stop. The losers will be the (by now large) number of people who sent the last set of cheques, but received nothing back.

Ponzi games are named after an Italian, Charles Ponzi, who carried out a similar set of investment swindles, also known as *pyramid investment schemes*, in Boston in the US, in the 1920s. The typical pyramid investment scheme is a Ponzi game that asks you to invest in the scheme by putting some money up front, and then to recruit other investors to do the same. The scheme only pays out dividends so long as more and more investors are recruited. The recruitment process eventually stops and the last group of people to put money in lose their money.

In the late 1990s, a number of pyramid investment schemes were started in some of the former

communist countries of Eastern Europe; they were able to do so because of the lack of appropriate financial regulation, and perhaps also because of the lack of experience of the general public of those countries at that time with the capitalist system. This problem became particularly acute in Albania in 1997, where the government, remarkably, had appeared to approve a series of pyramid investment schemes. When the schemes inevitably collapsed, the citizens of Albania, who collectively had lost about 1 billion, took their protest to the streets in a revolt that toppled the government. Even as recently as 2009 Bernard Madoff, a US financier, was sentenced to 150 years in prison for masterminding what was in effect a large-scale Ponzi scheme, thought to be the largest in history.

Another reason why a constant equilibrium debt-to-GDP ratio is a sound rule of public finance is that it rules out Ponzi finance. Ponzi finance is a Ponzi game applied to the public debt, whereby the government issues public debt in order to service its debt (i.e. to pay the interest on its debt and repay capital when bonds mature). This requires greater and greater amounts of debt to be issued (and consequently higher and higher debt-to-GDP ratios), and eventually investors get worried about the size of the total public debt outstanding and stop buying government bonds. At this point, the government has no option but to default on its debt. Ponzi finance, like all Ponzi games, ends in tears.

cycle, since there is no official business cycle-dating committee in the UK (as there is, for example, in the US). Second, the government may define some of its spending as investment expenditure and therefore allow itself to borrow in order to finance this expenditure, when others might define it as current expenditure. For example, government expenditure on physical infrastructure such as school buildings is clearly investment, since it leads to an accumulation of physical capital. But what about an increase in spending on teachers' salaries? It could be argued that this is expenditure on a current service – teaching – and so is not investment. On the other hand, it might be argued that by using the money to

pay for more teachers (or better qualified teachers), the government has helped school students to learn more and to accumulate more human capital. According to that argument, spending more on teachers is investment. ■

16-7 Conclusion

Fiscal policy and government debt are central to macroeconomic policy. This chapter has discussed some of the economic issues that lie behind fiscal policy decisions. As we have seen, economists are not in complete agreement about the measurement or effects of government indebtedness. Nor are economists in agreement about the best budget policy. Given the profound importance of this topic, there seems little doubt that the debates will continue in the years to come.

Summary

1. The size of the government debt as a proportion of GDP varies greatly across European countries. The government debt of the United Kingdom – around 90 per cent of GDP – is just above the EU-27 median level of around 85 per cent.
2. Standard measures of the budget deficit are imperfect measures of fiscal policy because they do not correct for the effects of inflation, do not offset changes in government liabilities with changes in government assets, omit some liabilities altogether, and do not correct for the effects of the business cycle.
3. According to the traditional view of government debt, a debt-financed tax cut stimulates consumer spending and lowers national saving. This increase in consumer spending leads to greater aggregate demand and higher income in the short run, but it leads to a lower capital stock and lower income in the long run.
4. According to the Ricardian view of government debt, a debt-financed tax cut does not stimulate consumer spending because it does not raise consumers' overall resources – it merely reschedules taxes from the present to the future. The debate between the traditional and Ricardian views of government debt is ultimately a debate over how consumers behave. Are consumers rational or short-sighted? Do they face binding borrowing constraints? Are they economically linked to future generations through altruistic bequests? Economists' views of government debt hinge on their answers to these questions, but the consensus is probably that full Ricardian equivalence does not hold.

5. Most economists oppose a strict rule requiring a balanced budget. A budget deficit can sometimes be justified on the basis of short-run stabilization, tax smoothing or intergenerational redistribution of the tax burden.
6. Government debt can potentially have other effects. Large government debt or budget deficits may encourage excessive monetary expansion and, therefore, lead to greater inflation. The possibility of running budget deficits may encourage politicians to unduly burden future generations when setting government spending and taxes. A high level of government debt may risk capital flight and diminish a nation's influence around the world. Economists differ in which of these effects they consider most important.
7. Fiscal sustainability – the ability of a government to service its debt – requires that the debt-to-GDP ratio settle down at a constant equilibrium level, and that this equilibrium level be set at a 'prudent level', in order to allow for short-term shocks. The equilibrium level of the debt-to-GDP ratio multiplied by the rate of growth of nominal GDP gives the maximum total budget deficit (including interest payments), as a percentage of GDP, with which it is consistent.

KEY CONCEPTS

Capital budgeting

Cyclically adjusted budget deficit

Ricardian equivalence

Fiscal sustainability

Total budget deficit

Primary budget deficit

Debt-to-GDP ratio

QUESTIONS FOR REVIEW

1. What is the range of public debt-to-GDP ratios among developed countries?
2. Describe four problems affecting measurement of the government budget deficit.
3. According to the traditional view of government debt, how does a debt-financed tax cut affect public saving, private saving and national saving?
4. According to the Ricardian view of government debt, how does a debt-financed tax cut affect public saving, private saving and national saving?
5. Do you believe the traditional or the Ricardian view of government debt? Why?
6. Give three reasons why a budget deficit might be a good policy choice.
7. Why might the level of government debt affect the government's incentives regarding money creation?
8. Give two conditions for fiscal sustainability, one in terms of the primary budget deficit and one in terms of the total budget deficit.

PROBLEMS AND APPLICATIONS

1. In the 1990s, Italy underwent a massive privatization of its public-sector corporations, including its public utility and telecom companies. As a result, its debt-to-GDP ratio fell by around 10 percentage points in the mid to late 1990s. Would this reduction in national debt have been effected if Italy had adopted capital budgeting?
2. Draft a letter to the Finance Minister as described in Section 16-3, explaining and evaluating the Ricardian view of government debt.
3. Social security systems levy a tax on workers and pay benefits to the elderly. Suppose that the government increases both the tax and the benefits. For simplicity, assume that the government announces that the increases will last for one year only.
 - a. How do you suppose this change would affect the economy? (*Hint:* Think about the marginal propensities to consume of the young and the old.)
 - b. Does your answer depend on whether generations are altruistically linked?
4. Some economists have proposed the rule that the cyclically adjusted budget deficit always be balanced. Compare this proposal to a strict balanced-budget rule. Which is preferable? What problems do you see with the rule requiring a balanced cyclically adjusted budget?
5. Using the library or the Internet, find some recent projections for the future path of government debt in your country as a percentage of GDP. What assumptions are made about government spending, taxes and economic growth? Do you think these assumptions are reasonable? If the country experiences a productivity slowdown, how will reality differ from this projection?