

# 13

# Fiscal Policy

## SPENDING OUR WAY OUT OF A RECESSION

**THE U.S. ECONOMY** entered the downturn that would eventually be dubbed the Great Recession at the end of 2007, but it didn't fall off a cliff until the fall of 2008, when it took a terrifying plunge, losing more than 6 million jobs over the 10 months between August 2008 and June 2009. Policy makers scrambled on multiple fronts to stabilize the situation, such as cutting interest rates and rushing emergency aid to troubled banks.



Jim West/Alamy



Nightman1965/Shutterstock

In making fiscal policy, timing is crucial. Expansionary fiscal policy was appropriate during the deeply depressed economy of 2009. But it is counterproductive if undertaken when the economy is strong, as it was in 2017.

However, advisers to newly elected President Obama believed that these measures were insufficient to do any more than limit the bleeding. They believed that in order to restore the jobs being lost, the economy needed a boost—a *stimulus*—from the federal government's budget, in the form of increased spending and tax cuts.

The president took their advice, and the American Recovery and Reinvestment Act was signed into law on February 17, 2009. It increased federal spending, temporarily expanded federal assistance programs like food stamps and unemployment insurance, provided aid to financially strapped state and local governments, and cut some taxes. It came with a total price tag of about \$840 billion, mostly falling in the first two years, when it peaked at about 10% of the federal budget. Policy makers argued that this stimulus package would provide crucial support to the severely depressed economy and accelerate the pace of recovery.

It was a classic example of *fiscal policy*: changes in taxes and government spending to stabilize the economy by shifting the aggregate demand curve. In this case the fiscal policy was *expansionary*, designed to shift the aggregate demand curve out; fiscal policies that shift the aggregate demand curve in are *contractionary*.

Fiscal policy is often controversial. In 2009, some observers believed it was a mistake to increase government spending at a time of widespread distress. One member of Congress spoke for many when he declared that the government should spend *less* in hard times: "American families are tightening their belts, but they don't see government tightening its belt." There were also concerns that the stimulus would widen the budget deficit. But most economists believe that expansionary fiscal policy is appropriate when the economy is depressed.

The qualification—"when the economy is depressed"—is important. In 2017, eight

years after the Obama stimulus, the new Trump administration proposed measures that in some respects looked similar to the Obama stimulus: tax cuts and additional spending on infrastructure. While some economists supported these proposals, most did not—including many who supported the Obama stimulus. Weren't they being inconsistent? In reality, no: in early 2009 the U.S. economy was deeply depressed and was heading further downward. By contrast, in early 2017 the economy was growing strongly and appeared close to full employment. The economists who declined to support the proposed Trump stimulus knew that stimulus, delivered at the wrong time, was likely to be counterproductive to the economy. They understood that, in making fiscal policy, timing is crucial.

In this chapter we'll see how fiscal policy fits into the models of economic fluctuation we studied in Chapters 11 and 12. We will also see why budget deficits and government debt can be problems, and why short-run and long-run considerations can pull fiscal policy in opposite directions. ●

### WHAT YOU WILL LEARN

- What is fiscal policy and why is it an essential tool in managing economic fluctuations?
- Which policies constitute **expansionary fiscal policy** and which constitute **contractionary fiscal policy**?
- Why does fiscal policy have a multiplier effect and how is this effect influenced by **automatic stabilizers**?
- Why do governments calculate the **cyclically adjusted budget balance**?
- Why can a large **public debt** and **implicit liabilities** of the government be a cause for concern?

## || Fiscal Policy: The Basics

Modern governments in economically advanced countries spend a great deal of money and collect a lot in taxes. Figure 13-1 shows government spending and tax revenue as percentages of GDP for a selection of high-income countries in 2016. As you can see, the French government sector is relatively large, accounting for more than half of the French economy. The government of the United States plays a smaller role in the economy than those of Canada and most European countries. But that role is still sizable, with the government playing a major role in the U.S. economy. As a result, changes in the federal budget—changes in government spending or in taxation—can have large effects on the American economy.

To analyze these effects, we begin by showing how taxes and government spending affect the economy's flow of income. Then we can see how changes in spending and tax policy affect aggregate demand.

### Taxes, Purchases of Goods and Services, Government Transfers, and Borrowing

In Figure 7-1 we showed the circular flow of income and spending in the economy as a whole. One of the sectors represented in that figure was the government. Funds flow *into* the government in the form of taxes and government borrowing; funds flow *out* in the form of government purchases of goods and services and government transfers to households.

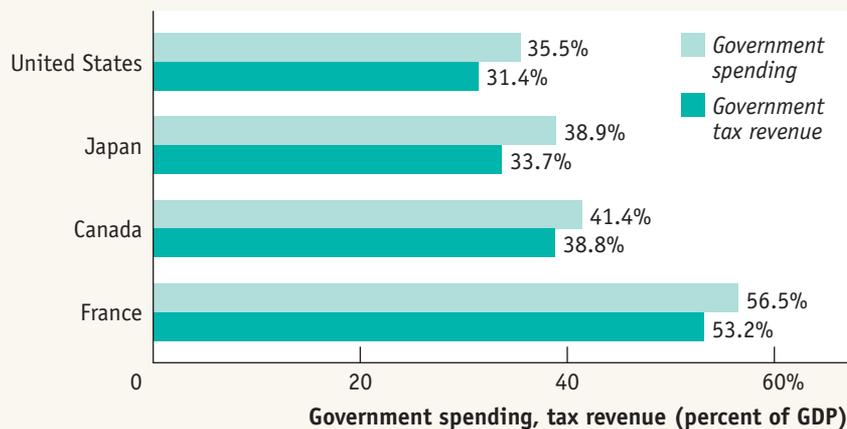
What kinds of taxes do Americans pay, and where does the money go? Figure 13-2 shows the composition of U.S. tax revenue in 2016. Taxes, of course, are required payments to the government. In the United States, taxes are collected at the national level by the federal government; at the state level by each state government; and at local levels by counties, cities, and towns. At the federal level, the taxes that generate the greatest revenue are income taxes on both personal income and corporate profits as well as *social insurance* taxes, which we'll explain shortly. At the state and local levels, the picture is more complex: these governments rely on a mix of sales taxes, property taxes, income taxes, and fees of various kinds.

Overall, taxes on personal income and corporate profits accounted for 47% of total government revenue in 2016; social insurance taxes accounted for 24%; and a variety of other taxes, collected mainly at the state and local levels, accounted for the rest.

**FIGURE 13-1 Government Spending and Tax Revenue for Selected High-Income Countries in 2016**

Government spending and tax revenue are represented as a percentage of GDP. France has a particularly large government sector, representing more than half of its GDP. The U.S. government sector, although sizable, is smaller than those of Canada and most European countries.

*Data from: IMF World Economic Outlook.*



Copyright © 2017 Worth Publishers. Distributed by Worth Publishers. Not for redistribution.

Figure 13-3 shows the composition of total U.S. government spending in 2016, which takes two broad forms. One form is purchases of goods and services. This includes everything from ammunition for the military to the salaries of public school teachers (who are treated in the national accounts as providers of a service—education). The big items here are national defense and education. The category “Other goods and services” consists mainly of state and local spending on a variety of services, from police and firefighters to highway construction and maintenance.

The other form of government spending is government transfers, which are payments by the government to households for which no good or service is provided in return. In the United States, as well as in Canada and Europe, government transfers represent a very large proportion of the budget. Most U.S. government spending on transfer payments is accounted for by four programs:

- Social Security, which provides guaranteed income to older Americans, disabled Americans, and the surviving spouses and dependent children of deceased or retired beneficiaries
- Medicare, which covers much of the cost of health care for Americans over age 65
- Medicaid, which covers much of the cost of health care for Americans with low incomes
- The Affordable Care Act (ACA), which seeks to make health insurance available and affordable to all Americans

The term **social insurance** is used to describe government programs that are intended to protect families against economic hardship. These include Social Security, Medicare, Medicaid, and the ACA, as well as smaller programs such as unemployment insurance and food stamps. The ACA works through a system of regulated private insurance markets, subsidies, and an expansion of Medicaid eligibility, and is much smaller than the other three large programs. Social insurance programs in the United States are largely paid for with special, dedicated taxes on wages—the social insurance taxes mentioned earlier. The ACA is an exception: it is funded mainly by taxes on private health insurance purchases.

How do tax policy and government spending affect the economy? The answer is that taxation and government spending have a strong effect on total aggregate spending in the economy.

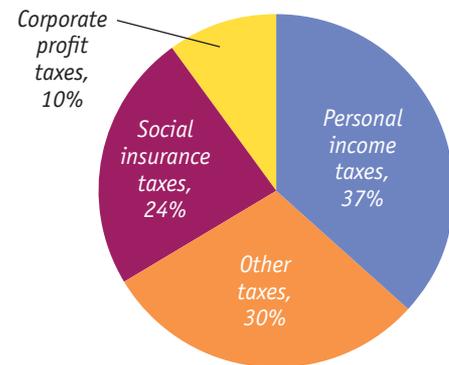
## The Government Budget and Total Spending

Let's recall the basic equation of national income accounting:

$$(13-1) \text{ GDP} = C + I + G + X - IM$$

The left-hand side of this equation is GDP, the value of all final goods and services produced in the economy. The right-hand side is aggregate spending, total spending on final goods and services produced in the economy. It is the sum of consumer spending ( $C$ ), investment spending ( $I$ ), government purchases of goods and services ( $G$ ), and the value of exports ( $X$ ) minus the value of imports ( $IM$ ). It includes all the sources of aggregate demand.

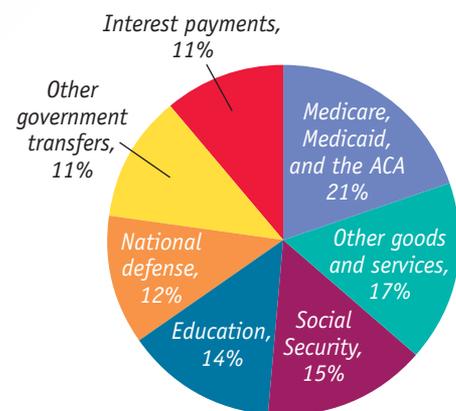
**FIGURE 13-2 Sources of Tax Revenue in the United States, 2016**



Personal income taxes, taxes on corporate profits, and social insurance taxes account for most government tax revenue. The rest is a mix of property taxes, sales taxes, and other sources of revenue. (Percentages do not add to 100 due to rounding.)

Data from: Bureau of Economic Analysis.

**FIGURE 13-3 Government Spending in the United States, 2016**



The two types of government spending are purchases of goods and services and government transfers. The biggest items in government purchases are national defense and education. The biggest items in government transfers are Social Security, Medicare, Medicaid, and the Affordable Care Act. (Percentages do not add to 100 due to rounding.)

Data from: Bureau of Economic Analysis.

**Social insurance** programs are government programs intended to protect families against economic hardship.

The government directly controls one of the variables on the right-hand side of Equation 13-1: government purchases of goods and services ( $G$ ). But that's not the only effect fiscal policy has on aggregate spending in the economy. Through changes in taxes and transfers, it also influences consumer spending ( $C$ ) and, in some cases, investment spending ( $I$ ).

To see why the budget affects consumer spending, recall that *disposable income*, the total income households have available to spend, is equal to the total income they receive from wages, dividends, interest, and rent, *minus* taxes, *plus* government transfers. So either an increase in taxes or a reduction in government transfers *reduces* disposable income. And a fall in disposable income, other things equal, leads to a fall in consumer spending. Conversely, either a decrease in taxes or an increase in government transfers *increases* disposable income. And a rise in disposable income, other things equal, leads to a rise in consumer spending.

The government's ability to affect investment spending is a more complex story, which we won't discuss in detail. The important point is that the government taxes profits, and changes in the rules that determine how much a business owes can increase or reduce the incentive to spend on investment goods.

Because the government itself is one source of spending in the economy, and because taxes and transfers can affect spending by consumers and firms, the government can use changes in taxes or government spending to *shift the aggregate demand curve*. And as we saw in Chapter 12, there are sometimes good reasons to shift the aggregate demand curve.

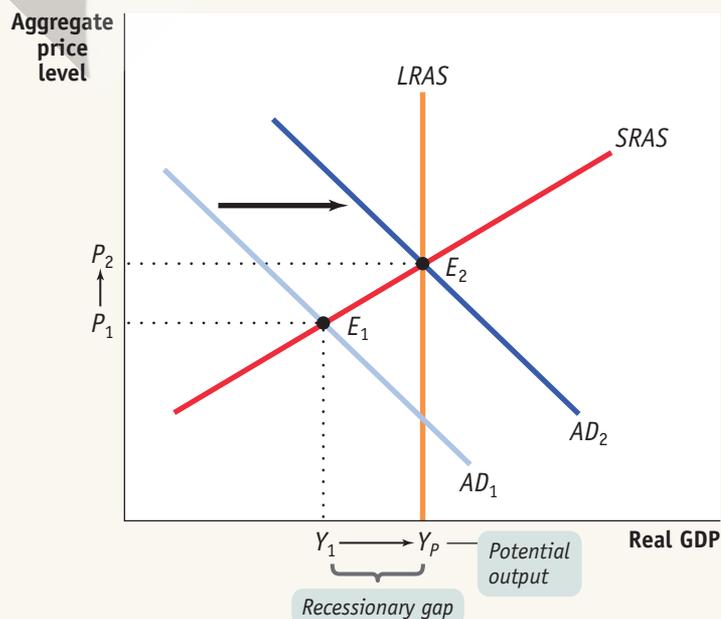
### Expansionary and Contractionary Fiscal Policy

Why would the government want to shift the aggregate demand curve? Because it wants to close either a recessionary gap, created when aggregate output falls below potential output, or an inflationary gap, created when aggregate output exceeds potential output.

Figure 13-4 shows the case of an economy facing a recessionary gap.  $SRAS$  is the short-run aggregate supply curve,  $LRAS$  is the long-run aggregate supply curve, and  $AD_1$  is the initial aggregate demand curve. At the initial short-run

**FIGURE 13-4** Expansionary Fiscal Policy Can Close a Recessionary Gap

The economy is in short-run macroeconomic equilibrium at  $E_1$ , where the aggregate demand curve,  $AD_1$ , intersects the  $SRAS$  curve. However, it is not in long-run macroeconomic equilibrium. At  $E_1$ , there is a recessionary gap of  $Y_P - Y_1$ . An expansionary fiscal policy—an increase in government purchases of goods and services, a reduction in taxes, or an increase in government transfers—shifts the aggregate demand curve rightward. It can close the recessionary gap by shifting  $AD_1$  to  $AD_2$ , moving the economy to a new short-run macroeconomic equilibrium,  $E_2$ , which is also a long-run macroeconomic equilibrium.



Copyright © 2017 Worth Publishers. Distributed by Worth Publishers. Not for redistribution.

macroeconomic equilibrium,  $E_1$ , aggregate output is  $Y_1$ , below potential output,  $Y_p$ . What the government would like to do is increase aggregate demand, shifting the aggregate demand curve rightward to  $AD_2$ . This would increase aggregate output, making it equal to potential output. Fiscal policy that increases aggregate demand, called **expansionary fiscal policy**, normally takes one of three forms:

1. An increase in government purchases of goods and services
2. A cut in taxes
3. An increase in government transfers

The 2009 stimulus (or the Recovery Act) was a combination of all three: a direct increase in federal spending and aid to state governments to help them maintain spending, tax cuts for most families, and increased aid to the unemployed.

Figure 13-5 shows the opposite case—an economy facing an inflationary gap. Again,  $SRAS$  is the short-run aggregate supply curve,  $LRAS$  is the long-run aggregate supply curve, and  $AD_1$  is the initial aggregate demand curve. At the initial equilibrium,  $E_1$ , aggregate output is  $Y_1$ , above potential output,  $Y_p$ . As we'll explain in later chapters, policy makers often try to head off inflation by eliminating inflationary gaps. To eliminate the inflationary gap shown in Figure 13-5, fiscal policy must reduce aggregate demand and shift the aggregate demand curve leftward to  $AD_2$ . This reduces aggregate output and makes it equal to potential output. Fiscal policy that reduces aggregate demand, called **contractionary fiscal policy**, is the opposite of expansionary fiscal policy. It is implemented in three possible ways:

1. A reduction in government purchases of goods and services
2. An increase in taxes
3. A reduction in government transfers

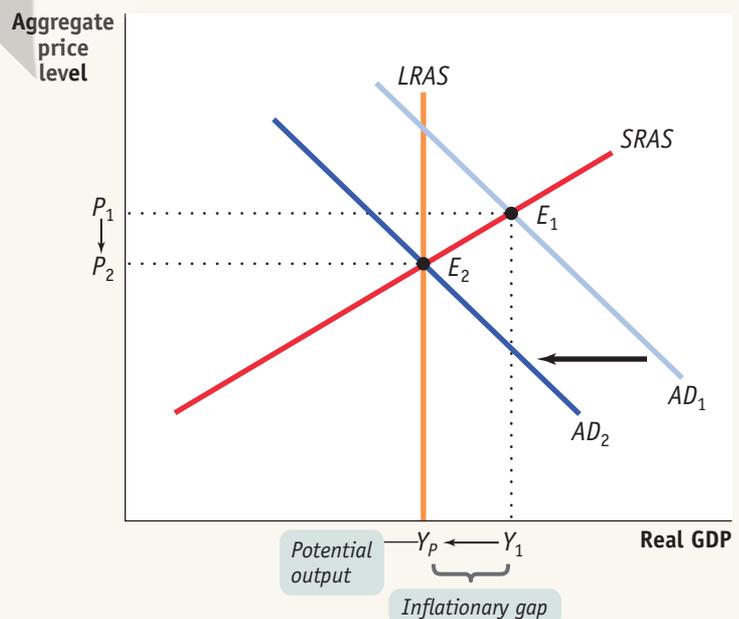
A classic example of contractionary fiscal policy occurred in 1968, when U.S. policy makers grew worried about rising inflation. President Lyndon Johnson imposed a temporary 10% surcharge on taxable income—everyone's income taxes

**Expansionary fiscal policy** is fiscal policy that increases aggregate demand.

**Contractionary fiscal policy** is fiscal policy that reduces aggregate demand.

**FIGURE 13-5** Contractionary Fiscal Policy Can Close an Inflationary Gap

The economy is in short-run macroeconomic equilibrium at  $E_1$ , where the aggregate demand curve,  $AD_1$ , intersects the  $SRAS$  curve. But it is not in long-run macroeconomic equilibrium. At  $E_1$ , there is an inflationary gap of  $Y_1 - Y_p$ . A contractionary fiscal policy—such as reduced government purchases of goods and services, an increase in taxes, or a reduction in government transfers—shifts the aggregate demand curve leftward. It closes the inflationary gap by shifting  $AD_1$  to  $AD_2$ , moving the economy to a new short-run macroeconomic equilibrium,  $E_2$ , which is also a long-run macroeconomic equilibrium.



Copyright © 2017 Worth Publishers. Distributed by Worth Publishers. Not for redistribution.

were increased by 10%. He also tried to scale back government purchases of goods and services, which had risen dramatically because of the cost of the Vietnam War.

### Can Expansionary Fiscal Policy Actually Work?

In practice, the use of fiscal policy—in particular, the use of expansionary fiscal policy in the face of a recessionary gap—is often controversial. We'll examine the origins of these controversies in detail in Chapter 17. But for now, let's quickly summarize the major points of the debate over expansionary fiscal policy, so we can understand when the critiques are justified and when they are not.

There are three main arguments against the use of expansionary fiscal policy.

- Government spending always crowds out private spending
- Government borrowing always crowds out private investment spending
- Government budget deficits lead to reduced private spending

The first of these claims is wrong in principle, but it has nonetheless played a prominent role in public debates. The second is valid under some, but not all, circumstances. The third argument, although it raises some important issues, isn't a good reason to believe that expansionary fiscal policy doesn't work.

#### Claim 1: "Government Spending Always Crowds Out Private Spending"

Some claim that expansionary fiscal policy can never raise aggregate spending and therefore can never raise aggregate income, with reasons that go something like this: "Every dollar that the government spends is a dollar taken away from the private sector. So any rise in government spending must be offset by an equal fall in private spending." In other words, every dollar spent by the government *crowds out*, or displaces, a dollar of private spending.

But the statement is wrong because it assumes that resources in the economy are always fully employed and, as a result, the aggregate income earned in the economy is always a fixed sum—which isn't true. In reality, whether or not government spending crowds out private spending depends upon the state of the economy. In particular, when the economy is suffering from a recessionary gap, there are unemployed resources in the economy, and output, and therefore income, is below its potential level. Expansionary fiscal policy during these periods puts unemployed resources to work and generates higher spending and higher income. Government spending crowds out private spending only when the economy is operating at full employment. So the argument that expansionary fiscal policy always crowds out private spending is wrong in principle.

#### Claim 2: "Government Borrowing Always Crowds Out Private Investment Spending"

In Chapter 10, we discussed the possibility that government borrowing uses funds that would have otherwise been used for private investment spending—that is, it crowds out private investment spending. So how valid is the argument that government borrowing always reduces private investment spending?

Much like Claim 1, Claim 2 is wrong because whether crowding out occurs depends upon whether the economy is depressed or not. If the economy is not depressed, then increased government borrowing, by increasing the demand for loanable funds, can raise interest rates and crowd out private investment spending. However, if the economy is depressed, crowding out is much less likely to occur. When the economy is at far less than full employment, a fiscal expansion will lead to higher incomes, which in turn leads to increased savings at any given interest rate. This larger pool of savings allows the government to borrow without driving up interest rates. The stimulus of 2009 was a case in point: despite high levels of government borrowing, U.S. interest rates stayed near historic lows. In the end, government borrowing crowds out private investment spending only when the economy is operating at full employment (which is why most economists declined to endorse the Trump administration's 2017 fiscal expansion proposals).

**Claim 3: “Government Budget Deficits Lead to Reduced Private Spending”** Other things equal, expansionary fiscal policy leads to a larger budget deficit and greater government debt. And higher debt will eventually require the government to raise taxes to pay it off. So, according to the third argument against expansionary fiscal policy, consumers, anticipating that they must pay higher taxes in the future to pay off today’s government debt, will cut their spending today in order to save money. This argument, first made by nineteenth-century economist David Ricardo, is known as *Ricardian equivalence*. It is an argument often taken to imply that expansionary fiscal policy will have no effect on the economy because far-sighted consumers will undo any attempts at expansion by the government. (And will also undo any contractionary fiscal policy, for that matter.)

In reality, however, it’s doubtful that consumers behave with such foresight and budgeting discipline. Most people, when provided with extra cash (generated by the fiscal expansion), will spend at least some of it. So even fiscal policy that takes the form of temporary tax cuts or transfers of cash to consumers probably does have an expansionary effect.

Moreover, it’s possible to show that even with Ricardian equivalence, a temporary rise in government spending that involves direct purchases of goods and services—such as a program of road construction—would still lead to a boost in total spending in the near term. That’s because even if consumers cut back their current spending in anticipation of higher future taxes, their reduced spending will take place over an extended period as consumers save over time to pay the future tax bill. Meanwhile, the additional government spending will be concentrated in the near future, when the economy needs it.

So although the effects emphasized by Ricardian equivalence may reduce the impact of fiscal expansion, the claim that it makes fiscal expansion completely ineffective is neither consistent with how consumers actually behave nor a reason to believe that increases in government spending have no effect. So, in the end, it’s not a valid argument against expansionary fiscal policy.

**In Sum** The extent to which we should expect expansionary fiscal policy to work depends upon the circumstances. Recall our conclusion in the chapter opening story: in making fiscal policy, timing is critical. When the economy has a recessionary gap—as it did when the 2009 stimulus was passed—economics tells us that this is just the kind of situation in which expansionary fiscal policy helps the economy. However, when the economy is already at full employment, as it was very close to in 2017, expansionary fiscal policy is the wrong policy and will lead to crowding out, an overheated economy, and higher inflation.

### A Cautionary Note: Lags in Fiscal Policy

Looking back at Figures 13-4 and 13-5, it may seem obvious that the government should actively use fiscal policy—always adopting an expansionary fiscal policy when the economy faces a recessionary gap and always adopting a contractionary fiscal policy when the economy faces an inflationary gap. But many economists caution against an extremely active stabilization policy, arguing that a government that tries too hard to stabilize the economy—through either fiscal policy or monetary policy—can end up making the economy less stable.

We’ll leave discussion of the warnings associated with monetary policy to Chapter 15. In the case of fiscal policy, one key reason for caution is that there are important *time lags* between when the policy is decided upon and when it is implemented. To understand the nature of these lags, consider the three things that have to happen before the government increases spending to fight a recessionary gap.

1. The government has to realize that the recessionary gap exists: economic data take time to collect and analyze, and recessions are often recognized only

months after they have begun. As we've seen, the Great Recession is generally considered to have begun in December 2007, but as late as September 2008 some economists were still questioning whether the recession was real.

2. The government has to develop a spending plan, which can itself take months, particularly if politicians take time debating how the money should be spent and passing legislation.
3. It takes time to spend money. For example, a road construction project begins with activities such as surveying that don't involve spending large sums. It may be quite some time before the big spending begins. The Recovery Act was passed in the first quarter of 2009, but much of its effect on federal spending, especially purchases of goods and services, didn't come until 2011.

Because of these lags, an attempt to increase spending to fight a recessionary gap may take so long to get going that the economy has already recovered on its own. In fact, the recessionary gap may have turned into an inflationary gap by the time expansionary fiscal policy takes effect. In that case, expansionary fiscal policy will make things worse instead of better.

This doesn't mean that fiscal policy should never be actively used. In early 2009 there was good reason to believe that the slump facing the U.S. economy would be both deep and long and that a fiscal stimulus designed to arrive over the next year or two would almost surely push aggregate demand in the right direction. In fact, as we'll see later in this chapter, the 2009 stimulus arguably faded out too soon, leaving the economy still deeply depressed when it ended. But the problem of lags makes the actual use of both fiscal and monetary policy harder than you might think from a simple analysis like the one we have just given.

## ECONOMICS >> *in Action*

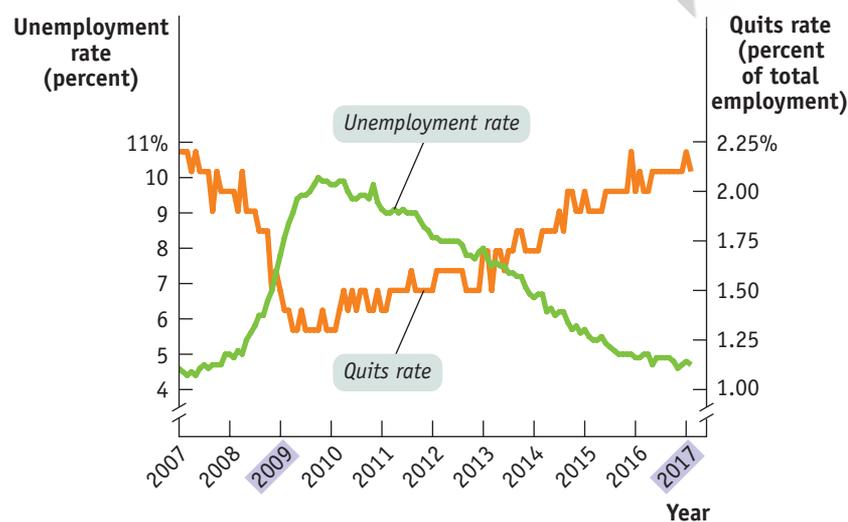
### A Tale of Two Stimuli

There were some broad similarities between the Obama stimulus of 2009 and proposals that were floated by the Trump administration soon after it took office in early 2017. We touch on both stimulus plans in the opening story. In both cases, a new administration was suggesting tax cuts (although not increased transfers) and

increased spending on infrastructure. Yet many economists who supported the Obama stimulus were dubious about the Trump plan, because the state of the economy had changed.

Figure 13-6 shows two indicators that played an important role in policy discussions at both times. One is the unemployment rate. The other is the *quits rate*, the fraction of workers voluntarily leaving their jobs each month. This rate is widely viewed as an indication of how good the labor market is: workers are reluctant to quit if they believe new jobs are very hard to find. For this reason, the quits rate is a useful backup to the unemployment rate: if you're unsure whether the unemployment rate is giving an accurate read on the situation, you can check whether the quits rate is telling the same story.

FIGURE 13-6 Comparing the State of the U.S. Economy in 2009 and 2017



Data from: Federal Reserve Bank of St. Louis.

Copyright © 2017 Worth Publishers. Distributed by Worth Publishers. Not for redistribution.

What you can see from Figure 13-6 is that in early 2009 the United States showed all the signs of a deeply depressed economy, in the grip of an accelerating plunge, with unemployment high and rising and the quits rate low and falling. By early 2017, however, the data were telling the opposite story: a low unemployment rate and a high quits rate indicated that jobs were relatively plentiful.

This difference meant that the case for expansionary fiscal policy was much weaker in 2017 than it has been in 2009: under 2017 conditions it was, in fact, likely that increased government spending would crowd out private spending, and that increased government borrowing would crowd out private investment. It was possible to favor the Trump administration's proposals for a variety of reasons. But the macroeconomics of fiscal policy made the potential downside much higher than in 2009.

### >> Check Your Understanding 13-1

Solutions appear at back of book.

- In each of the following cases, determine whether the policy is an expansionary or contractionary fiscal policy.
  - Several military bases around the country, which together employ tens of thousands of people, are closed.
  - The number of weeks an unemployed person is eligible for unemployment benefits is increased.
  - The federal tax on gasoline is increased.
- Explain why federal disaster relief, which quickly disburses funds to victims of natural disasters such as hurricanes, floods, and large-scale crop failures, will stabilize the economy more effectively after a disaster than relief that must be legislated.
- Is the following statement true or false? Explain. "When the government expands, the private sector shrinks; when the government shrinks, the private sector expands."

## || Fiscal Policy and the Multiplier

An expansionary fiscal policy, like the 2009 stimulus, pushes the aggregate demand curve to the right. A contractionary fiscal policy pushes the aggregate demand curve to the left. For policy makers, however, knowing the direction of the shift isn't enough: they need estimates of *how much* a given policy will shift the aggregate demand curve. To get these estimates, they use the concept of the multiplier, which we learned about in Chapter 11.

### Multiplier Effects of an Increase in Government Purchases of Goods and Services

Suppose that a government decides to spend \$50 billion building bridges and roads. The government's purchases of goods and services will directly increase total spending on final goods and services by \$50 billion. But as we learned in Chapter 11, there will also be an indirect effect: the government's purchases will start a chain reaction throughout the economy. The firms that produce the goods and services purchased by the government earn revenues that flow to households in the form of wages, profits, interest, and rent. This increase in disposable income leads to a rise in consumer spending. The rise in consumer spending, in turn, induces firms to increase output, leading to a further rise in disposable income, which leads to another round of consumer spending increases, and so on.

As we know, the *multiplier* is the ratio of the change in real GDP caused by an autonomous change in aggregate spending to the size of that autonomous change. An increase in government purchases of goods and services is a prime example of such an autonomous increase in aggregate spending.

### >> Quick Review

- The main channels of fiscal policy are taxes and government spending. Government spending takes the form of purchases of goods and services as well as transfers.
- In the United States, most government transfers are accounted for by **social insurance** programs designed to alleviate economic hardship—principally Social Security, Medicare, Medicaid, and the Affordable Care Act (ACA).
- The government controls  $G$  directly and influences  $C$  and  $I$  through taxes and transfers.
- Expansionary fiscal policy** is implemented by an increase in government spending, a cut in taxes, or an increase in government transfers. **Contractionary fiscal policy** is implemented by a reduction in government spending, an increase in taxes, or a reduction in government transfers.
- Arguments against the effectiveness of expansionary fiscal policy based upon crowding out are valid only when the economy is at or close to full employment. The argument that expansionary fiscal policy won't work because of Ricardian equivalence—that consumers will cut back spending today to offset expected future tax increases—appears to be untrue in practice. What is clearly true is that time lags can reduce the effectiveness of fiscal policy, and potentially render it counterproductive.



Expansionary or contractionary fiscal policy will start a chain reaction throughout the economy.

Grafissimo/Getty Images

In Chapter 11 we considered a simple case in which there are no taxes or international trade, so that any change in GDP accrues entirely to households. We also assumed that the aggregate price level is fixed, so that any increase in nominal GDP is also a rise in real GDP, and that the interest rate is fixed. In that case the multiplier is  $1/(1 - MPC)$ . Recall that *MPC* is the *marginal propensity to consume*, the fraction of an additional dollar in disposable income that is spent. For example, if the marginal propensity to consume is 0.5, the multiplier is  $1/(1 - 0.5) = 1/0.5 = 2$ . Given a multiplier of 2, a \$50 billion increase in government purchases of goods and services would increase real GDP by \$100 billion. Of that \$100 billion, \$50 billion is the initial effect from the increase in *G*, and the remaining \$50 billion is the subsequent effect arising from the increase in consumer spending.

What happens if government purchases of goods and services are instead reduced? The math is exactly the same, except that there's a minus sign in front: if government purchases of goods and services fall by \$50 billion and the marginal propensity to consume is 0.5, real GDP falls by \$100 billion.

### Multiplier Effects of Changes in Government Transfers and Taxes

Expansionary or contractionary fiscal policy need not take the form of changes in government purchases of goods and services. Governments can also change transfer payments or taxes. In general, however, a change in government transfers or taxes shifts the aggregate demand curve by *less* than an equal-sized change in government purchases, resulting in a smaller effect on real GDP.

To see why, imagine that instead of spending \$50 billion on building bridges, the government simply hands out \$50 billion in the form of government transfers. In this case, there is no direct effect on aggregate demand, as there was with government purchases of goods and services. Real GDP goes up because households spend some of that \$50 billion—but they won't spend it all.

Table 13-1 shows a hypothetical comparison of two expansionary fiscal policies assuming an *MPC* equal to 0.5: one in which the government directly purchases \$50 billion in goods and services and one in which the government makes transfer payments instead, sending out \$50 billion in checks to consumers. In each case there is a first-round effect on real GDP, either from purchases by the government or from purchases by the consumers who received the checks, followed by a series of additional rounds as rising real GDP raises disposable income.

However, the first-round effect of the transfer program is smaller. Because we have assumed that the *MPC* is 0.5, only \$25 billion of the \$50 billion is spent, with the other \$25 billion saved. And as a result, all the further rounds are smaller, too. In the end, the transfer payment increases real GDP by only \$50 billion, equal to  $MPC \times 1/(1 - MPC)$ . In comparison, a \$50 billion increase in government purchases produces a \$100 billion increase in real GDP, equal to  $1/(1 - MPC)$ .

Overall, when expansionary fiscal policy takes the form of a rise in transfer payments, real GDP may rise by either more or less than the initial government outlay—that is, the multiplier may be either more or less than 1 depending upon the size of the *MPC*. In Table 13-1, with an *MPC* equal to 0.5, the multiplier is exactly 1: a \$50 billion rise in transfer payments increases real GDP by \$50 billion. If the *MPC* is less than 0.5, so that a smaller share of the initial transfer is spent, the multiplier

**TABLE 13-1** Hypothetical Effects of a Fiscal Policy When *MPC* = 0.5

Effect on real GDP	\$50 billion rise in government purchases of goods and services	\$50 billion rise in government transfer payments
First round	\$50 billion	\$25 billion
Second round	\$25 billion	\$12.5 billion
Third round	\$12.5 billion	\$6.25 billion
•	•	•
•	•	•
•	•	•
Total effect	\$100 billion	\$50 billion
<b>Total effect in terms of multiplier</b>	$\Delta Y = \Delta G \times 1/(1 - MPC)$	$\Delta Y = \Delta TR \times MPC \times 1/(1 - MPC)$

on that transfer is *less* than 1. If a larger share of the initial transfer is spent, the multiplier is *more* than 1.

A tax cut has an effect similar to the effect of a transfer. It increases disposable income, leading to a series of increases in consumer spending. But the overall effect is smaller than that of an equal-sized increase in government purchases of goods and services: the autonomous increase in aggregate spending is smaller because households save part of the amount of the tax cut.

We should also note that taxes introduce a further complication—they typically change the size of the multiplier. That’s because in the real world governments rarely impose **lump-sum taxes**, in which the amount of tax a household owes is independent of its income. With lump-sum taxes there is no change in the multiplier. Instead, the great majority of tax revenue is raised via taxes that are not lump-sum, and so tax revenue depends upon the level of real GDP. As we’ll discuss shortly, and analyze in detail in this chapter’s appendix, non-lump-sum taxes reduce the size of the multiplier.

In practice, economists often argue that the size of the multiplier determines *who* among the population should get tax cuts or increases in government transfers. For example, compare the effects of an increase in unemployment benefits to a cut in taxes on profits distributed to shareholders as dividends. Consumer surveys suggest that the average unemployed worker will spend a higher share of any increase in his or her disposable income than would the average recipient of dividend income. That is, people who are unemployed tend to have a higher *MPC* than people who own a lot of stocks because the latter tend to be wealthier and tend to save more of any increase in disposable income. If that’s true, a dollar spent on unemployment benefits increases aggregate demand more than a dollar’s worth of dividend tax cuts.

**Lump-sum taxes** are taxes that don’t depend on the taxpayer’s income.

### How Taxes Affect the Multiplier

When we introduced the analysis of the multiplier in Chapter 11, we simplified matters by assuming that a \$1 increase in real GDP raises disposable income by \$1. In fact, however, government taxes capture some part of the increase in real GDP that occurs in each round of the multiplier process, since most government taxes depend positively on real GDP. As a result, disposable income increases by considerably less than \$1 once we include taxes in the model.

The increase in government tax revenue when real GDP rises isn’t the result of a deliberate decision or action by the government. It’s a consequence of the way the tax laws are written, which causes most sources of government revenue to increase *automatically* when real GDP goes up. For example, income tax receipts increase when real GDP rises because the amount each individual owes in taxes depends positively on his or her income, and households’ taxable income rises when real GDP rises. Sales tax receipts increase when real GDP rises because people with more income spend more on goods and services. And corporate profit tax receipts increase when real GDP rises because profits increase when the economy expands.

The effect of these automatic increases in tax revenue is to reduce the size of the multiplier. Remember, the multiplier is the result of a chain reaction in which higher real GDP leads to higher disposable income, which leads to higher consumer spending, which leads to further increases in real GDP. The fact that the government siphons off some of any increase in real GDP means that at each stage of this process, the increase in consumer spending is smaller than it would be if taxes weren’t part of the picture. The result is to reduce the multiplier.

In fact, the effect of taxes on the multiplier is very similar to the effect of international trade, which also reduces the multiplier. In one case the multiplier process is weakened because at each stage some spending “leaks” into imports; in the other case, income “leaks” into taxes. The appendix to this chapter shows how to derive the multiplier when taxes that depend positively on real GDP are taken into account.

**Automatic stabilizers** are government spending and taxation rules that cause fiscal policy to be automatically expansionary when the economy contracts and automatically contractionary when the economy expands.

**Discretionary fiscal policy** is fiscal policy that is the result of deliberate actions by policy makers rather than rules.

Many macroeconomists believe it's a good thing that taxes reduce the multiplier. In the previous chapter we argued that most, though not all, recessions are the result of negative demand shocks. The same mechanism that makes tax revenue increase when the economy expands makes tax revenue decrease when the economy contracts. Since tax receipts decrease when real GDP falls, the effects of these negative demand shocks are smaller than in a world in which there were no taxes. The decrease in tax revenue reduces the adverse effect of the initial fall in aggregate demand.

The automatic decrease in government tax revenue generated by a fall in real GDP—caused by a decrease in the amount of taxes households pay—acts like an automatic expansionary fiscal policy implemented in the face of a recession. Similarly, when the economy expands, the government finds itself automatically pursuing a contractionary fiscal policy—a tax increase. Government spending and taxation rules that cause fiscal policy to be automatically expansionary when the economy contracts and automatically contractionary when the economy expands, without requiring any deliberate action by policy makers, are called **automatic stabilizers**.

The rules that govern tax collection aren't the only automatic stabilizers, although they are the most important ones. Some types of government transfers also play a stabilizing role. For example, more people receive unemployment insurance when the economy is depressed than when it is booming. The same is true of Medicaid and food stamps. So transfer payments tend to rise when the economy is contracting and fall when the economy is expanding. Like changes in tax revenue, these automatic changes in transfers tend to reduce the size of the multiplier because the total change in disposable income that results from a given rise or fall in real GDP is smaller.

As in the case of government tax revenue, many macroeconomists believe that it's a good thing that government transfers reduce the multiplier. Expansionary and contractionary fiscal policies that are the result of automatic stabilizers are widely considered helpful to macroeconomic stabilization because they blunt the extremes of the business cycle.

But what about fiscal policy that *isn't* the result of automatic stabilizers? **Discretionary fiscal policy** is the direct result of deliberate actions by policy makers rather than automatic adjustment. For example, during a recession, the government may pass legislation that cuts taxes and increases government spending in order to stimulate the economy. In general, economists tend to support the use of discretionary fiscal policy only in the case of a severe recession or sustained economic weakness.



AP Images

During the Great Depression, the Works Progress Administration (WPA), an example of discretionary fiscal policy, put millions of unemployed Americans to work constructing bridges, roads, buildings, dams, and parks.

## ECONOMICS >> *in Action*

### Austerity and the Multiplier

We've explained the logic of the fiscal multiplier, but what empirical evidence do economists have about multiplier effects in practice? Until a few years ago, the answer would have been that we didn't have nearly as much evidence as we'd like.

The problem was that large changes in fiscal policy are fairly rare, and usually happen at the same time other things are taking place, making it hard to separate the effects of spending and taxes from those of other factors. For example, the U.S. government drastically increased spending during World War II. But it also instituted rationing of many consumer goods and restricted construction of new homes in order to conserve resources for the war effort. So it is hard to

Copyright © 2017 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. WCN 02-200-203

distinguish the effects of the increase in government spending from the transformation of a peacetime economy to a war economy.

However, recent events offer considerable new evidence. In the wake of the Global Financial Crisis of 2009, several European governments found themselves facing debt crises. As loans they had taken out came due, these governments were either unable to raise new funds or were forced to pay extremely high interest rates. As a result, they had to turn to the rest of Europe for aid. In an attempt to reduce budget deficits, a condition of this aid was *austerity*—sharp cuts in spending plus tax increases. Austerity is a form of contractionary fiscal policy. So by comparing the economic performance of countries forced into austerity with the performance of countries that weren't, we get a relatively clear view of the effects of changes in spending and taxes.

Figure 13-7 compares the amount of austerity imposed in a number of countries between 2009 and 2015 to the growth in their GDP over the same period. Austerity is measured on the horizontal axis by the change in the *cyclically adjusted budget balance*, defined later in this chapter. As you can see, Greece stands out. It was forced to impose severe spending cuts and suffered a huge fall in output. But even without Greece there is a clear negative relationship. A line fitted through the scatterplot has a slope of  $-1.8$ . That is, the figure suggests that spending cuts and tax increases had an average multiplier of 1.8. Put another way, a contractionary fiscal policy that took \$1 out of the economy resulted in a \$1.80 fall in GDP.

Economists have offered a number of qualifications and caveats to this result, given that this wasn't truly a controlled experiment. Yet, recent experience strongly supports the proposition that fiscal policy does indeed move GDP in the predicted direction, with a multiplier of more than 1.

### >> Check Your Understanding 13-2

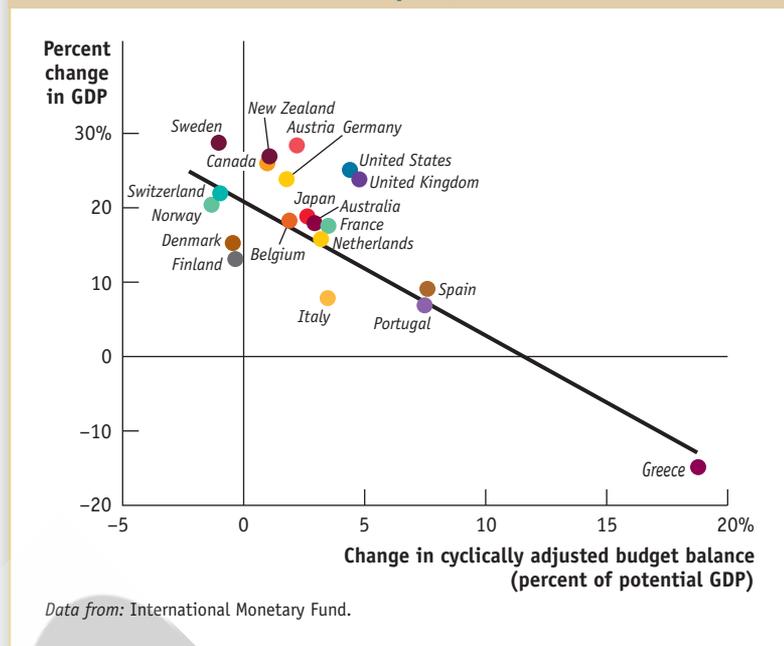
Solutions appear at back of book.

1. Explain why a \$500 million increase in government purchases of goods and services will generate a larger rise in real GDP than a \$500 million increase in government transfers.
2. Explain why a \$500 million reduction in government purchases of goods and services will generate a larger fall in real GDP than a \$500 million reduction in government transfers.
3. The country of Boldovia has no unemployment insurance benefits and a tax system using only lump-sum taxes. The neighboring country of Moldovia has generous unemployment benefits and a tax system in which residents must pay a percentage of their income. Which country will experience greater variation in real GDP in response to demand shocks, positive and negative? Explain.

## || The Budget Balance

Headlines about the government's budget tend to focus on just one point: whether the government is running a surplus or a deficit and, in either case, how big. People usually think of surpluses as good: when the federal government ran

FIGURE 13-7 The Fiscal Multiplier, 2009–2015



### >> Quick Review

- The amount by which changes in government purchases raise real GDP is determined by the multiplier.
- Changes in taxes and government transfers also move real GDP, but by less than equal-sized changes in government purchases.
- Taxes reduce the size of the multiplier unless they are **lump-sum taxes**.
- Taxes and some government transfers act as **automatic stabilizers** as tax revenue responds positively to changes in real GDP and some government transfers respond negatively to changes in real GDP. Many economists believe that it is a good thing that they reduce the size of the multiplier. In contrast, economists tend to support the use of **discretionary fiscal policy** only during severe recessions or periods of sustained economic weakness.

a record surplus in 2000, many people regarded it as a cause for celebration. Conversely, people usually think of deficits as bad: when the U.S. federal government ran record deficits from 2009 to 2011, many people regarded it as a cause for concern.

How do surpluses and deficits fit into the analysis of fiscal policy? Are deficits ever a good thing and surpluses a bad thing? To answer those questions, let's look at the causes and consequences of surpluses and deficits.

### The Budget Balance as a Measure of Fiscal Policy

What do we mean by surpluses and deficits? The budget balance, which was defined in Chapter 10, is the difference between the government's revenue, in the form of tax revenue, and its spending, both on goods and services and on government transfers, in a given year. That is, the budget balance—savings by government—is defined by Equation 13-2 (which is the same as Equation 10-7):

$$(13-2) S_{\text{Government}} = T - G - TR$$

where  $T$  is the value of tax revenues,  $G$  is government purchases of goods and services, and  $TR$  is the value of government transfers. As we've learned, a budget surplus is a positive budget balance and a budget deficit is a negative budget balance.

Other things equal, expansionary fiscal policies—increased government purchases of goods and services, higher government transfers, or lower taxes—reduce the budget balance for that year. That is, expansionary fiscal policies make a budget surplus smaller or a budget deficit bigger. Conversely, contractionary fiscal policies—reduced government purchases of goods and services, lower government transfers, or higher taxes—increase the budget balance for that year, making a budget surplus bigger or a budget deficit smaller.

You might think this means that changes in the budget balance can be used to measure fiscal policy. In fact, economists often do just that: they use changes in the budget balance as a “quick-and-dirty” way to assess whether current fiscal policy is expansionary or contractionary. But they always keep in mind two reasons this quick-and-dirty approach is sometimes misleading:

1. Two different changes in fiscal policy that have equal-sized effects on the budget balance may have quite unequal effects on the economy. As we have already seen, changes in government purchases of goods and services have a larger effect on real GDP than equal-sized changes in taxes and government transfers.
2. Often, changes in the budget balance are themselves the result, not the cause, of fluctuations in the economy.

To understand the second point, we need to examine the effects of the business cycle on the budget.

### The Business Cycle and the Cyclically Adjusted Budget Balance

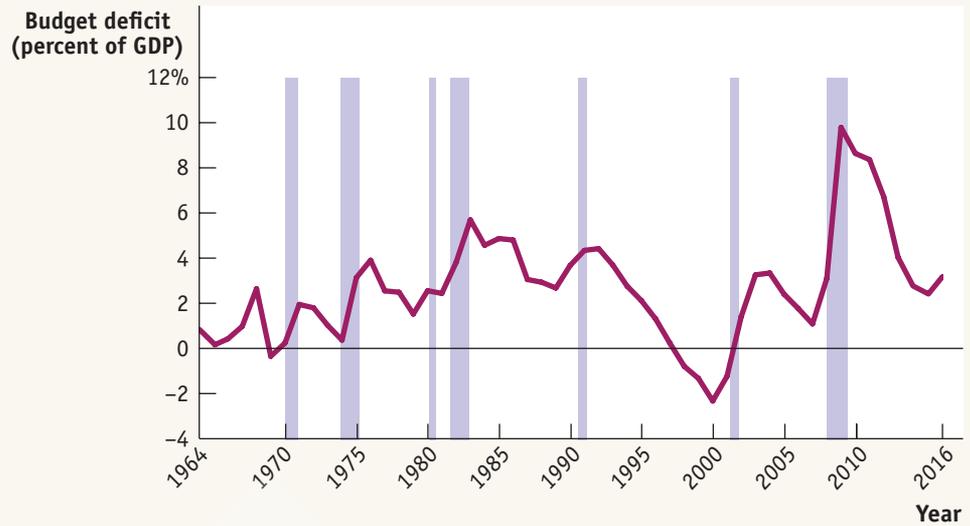
Historically there has been a strong relationship between the federal government's budget balance and the business cycle. The budget tends to move into deficit when the economy experiences a recession, but deficits tend to get smaller or even turn into surpluses when the economy is expanding. Figure 13-8 shows the federal budget deficit as a percentage of GDP from 1964 to 2016. Shaded areas indicate recessions; unshaded areas indicate expansions. As you can see, the federal budget deficit increased around the time of each recession and usually declined during expansions. In fact, in the late stages of the long expansion from 1991 to 2000, the deficit actually became negative—the budget deficit became a budget surplus.

Copyright © 2017 Worth Publishers. Distributed by Worth Publishers. Not for redistribution.

**FIGURE 13-8 The U.S. Federal Budget Deficit and the Business Cycle, 1964–2016**

The budget deficit as a percentage of GDP tends to rise during recessions (indicated by shaded areas) and fall during expansions.

*Data from: Federal Reserve Bank of St. Louis.*



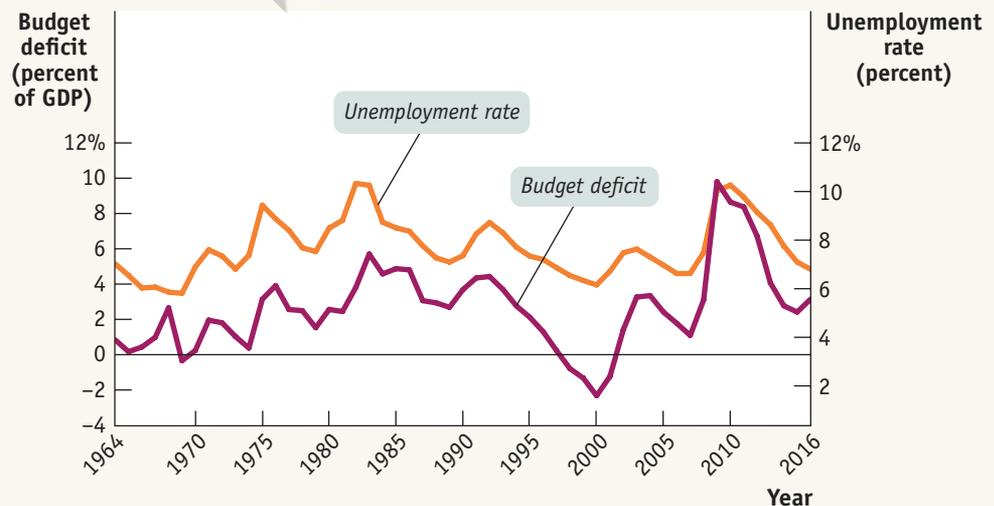
The relationship between the business cycle and the budget balance is even clearer if we compare the budget deficit as a percentage of GDP with the unemployment rate, as we do in Figure 13-9. The budget deficit almost always rises when the unemployment rate rises and falls when the unemployment rate falls.

Is this relationship between the business cycle and the budget balance evidence that policy makers engage in discretionary fiscal policy, using expansionary fiscal policy during recessions and contractionary fiscal policy during expansions? Not necessarily. To a large extent the relationship in Figure 13-9 reflects automatic stabilizers at work. As we saw earlier in the discussion of automatic stabilizers, government tax revenue tends to rise and some government transfers, like unemployment benefit payments, tend to fall when the economy expands. Conversely, government tax revenue tends to fall and some government transfers tend to rise when the economy contracts. So the budget tends to move

**FIGURE 13-9 The U.S. Federal Budget Deficit and the Unemployment Rate, 1964–2016**

There is a close relationship between the budget balance and the business cycle: a recession moves the budget balance toward deficit, but an expansion moves it toward surplus. Here, the unemployment rate serves as an indicator of the business cycle, and we should expect to see a higher unemployment rate associated with a higher budget deficit. This is confirmed by the figure: the budget deficit as a percentage of GDP moves closely in tandem with the unemployment rate.

*Data from: Federal Reserve Bank of St. Louis.*



Copyright © 2017 Worth Publishers. Distributed by Worth Publishers. Not for redistribution.

The **cyclically adjusted budget balance** is an estimate of what the budget balance would be if real GDP were exactly equal to potential output.

toward surplus during expansions and toward deficit during recessions even without any deliberate action on the part of policy makers.

In assessing budget policy, it's often useful to separate movements in the budget balance due to the business cycle from movements due to discretionary fiscal policy changes. The former are affected by automatic stabilizers and the latter by deliberate changes in government purchases, government transfers, or taxes. It's important to realize that business-cycle effects on the budget balance are temporary: both recessionary gaps (in which real GDP is below potential output) and inflationary gaps (in which real GDP is above potential output) tend to be eliminated in the long run. Removing their effects on the budget balance sheds light on whether the government's taxing and spending policies are sustainable in the long run.

In other words, do the government's tax policies yield enough revenue to fund its spending in the long run? As we'll learn shortly, this is a fundamentally more important question than whether the government runs a budget surplus or deficit in the current year.

To separate the effect of the business cycle from the effects of other factors, many governments produce an estimate of what the budget balance would be if there were neither a recessionary nor an inflationary gap. The **cyclically adjusted budget balance** is an estimate of what the budget balance would be if real GDP were exactly equal to potential output. It takes into account the extra tax revenue the government would collect and the transfers it would save if a recessionary gap were eliminated—or the revenue the government would lose and the extra transfers it would make if an inflationary gap were eliminated.

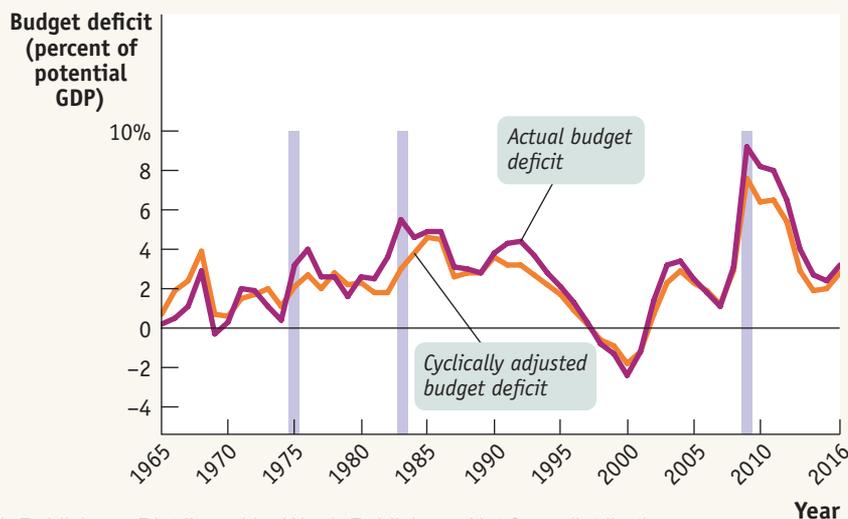
Figure 13-10 shows the actual budget deficit and the Congressional Budget Office estimate of the cyclically adjusted budget deficit, both as a percentage of potential GDP, from 1965 to 2016. As you can see, the cyclically adjusted budget deficit doesn't fluctuate as much as the actual budget deficit. In particular, large actual deficits, such as those of 1975, 1983, and 2009 (indicated by the purple lines), are mostly due to a depressed economy.

### Should the Budget Be Balanced?

Persistent budget deficits can cause problems for both the government and the economy. Yet politicians are often tempted to run deficits because this allows them to cater to voters by cutting taxes without cutting spending or by increasing

**FIGURE 13-10 The Actual Budget Deficit versus the Cyclically Adjusted Budget Deficit, 1965–2016**

The cyclically adjusted budget deficit is an estimate of what the budget deficit would be if the economy was at potential output. It fluctuates less than the actual budget deficit because years of large budget deficits also tend to be years when the economy has a large recessionary gap. The large actual deficits in 1975, 1983, and 2009 (which are reported in the following year) are indicated by the vertical purple lines. These deficits were mostly due to a depressed economy.  
Data from: Congressional Budget Office.



Copyright © 2017 Worth Publishers. Distributed by Worth Publishers. Not for redistribution.

spending without increasing taxes. As a result, there are occasional attempts by policy makers to force fiscal discipline by introducing legislation—even a constitutional amendment—prohibiting the government from running budget deficits. This is usually stated as a requirement that the budget be balanced—that revenues at least equal spending each fiscal year. Would it be a good idea to require a balanced budget annually?

Most economists don't think so. They believe that the government should only balance its budget on average—that it should be allowed to run deficits in bad years, offset by surpluses in good years. They don't believe the government should be forced to run a balanced budget *every year* because this would undermine the role of taxes and transfers as automatic stabilizers.

As we've learned, the tendency of tax revenue to fall and transfers to rise when the economy contracts helps to limit the size of recessions. But falling tax revenue and rising transfer payments generated by a downturn in the economy push the budget toward deficit. If constrained by a balanced-budget rule, the government would have to respond to this deficit with contractionary fiscal policies that would tend to deepen a recession.

Yet policy makers concerned about excessive deficits sometimes feel that rigid rules prohibiting—or at least setting an upper limit on—deficits are necessary. In fact, as the following Economics in Action explains, state and local governments do have such rules, which had a major impact on fiscal policy during the Great Recession and in its aftermath.

## ECONOMICS >> *in Action*

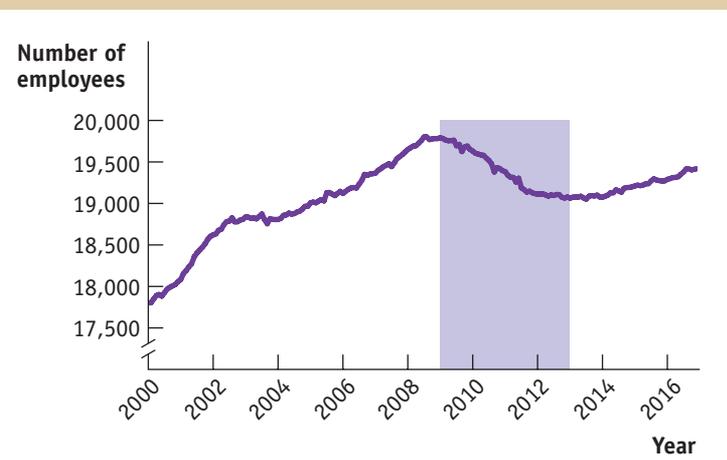
### Trying to Balance Budgets in a Recession

When the Great Recession struck, the U.S. federal government's budget deficit increased from just \$160 billion to \$1.4 trillion, partly because of stimulus measures but mainly because of automatic stabilizers: revenue fell sharply, while some expenditures, especially unemployment benefits, rose. Many observers worried about this deficit, but most economists thought that trying to balance the budget in the face of a recession would actually make that recession worse.

When it comes to government spending in America, however, the federal government isn't the only player. State and local governments account for about 40% of total government spending, and most government employment. (Most government employees are in positions that deliver essential services, such as schoolteachers, police officers, and firefighters.) And almost all of these state and local governments have rules requiring that they balance their budgets all the time.

There are a number of reasons for these rules, which make sense for each individual state or city. Taken together, however, the rules mean that for a large part of government in America, automatic stabilizers don't work. In fact, state and local governments cut back sharply in the face of a depressed economy, especially after 2010, when federal aid from the 2009 stimulus ended. Figure 13-11 shows the number of state and local employees from 2000 to 2016; as you can see, from 2009 until 2013 (the period shaded in purple), there were large cuts, mainly layoffs of teachers, in the face of falling revenues.

**FIGURE 13-11 State and Local Government Employment, 2000–2016**



Data from: Bureau of Labor Statistics; Federal Reserve Bank of St. Louis.

Copyright © 2017 Worth Publishers. Distributed by Worth Publishers. Not for redistribution.

**>> Quick Review**

- The budget deficit tends to rise during recessions and fall during expansions. This reflects the effect of the business cycle on the budget balance.
- The **cyclically adjusted budget balance** is an estimate of what the budget balance would be if the economy were at potential output. It varies less than the actual budget deficit.
- Most economists believe that governments should run budget deficits in bad years and budget surpluses in good years. A rule requiring a balanced budget would undermine the role of automatic stabilizers.

These actions at the state and local levels didn't fully offset the effects of automatic stabilizers at the federal level, but they still probably caused the recession to be deeper and the recovery slower than it would have been if we didn't have multiple levels of government, with the lower levels required to run balanced budgets.

**>> Check Your Understanding 13-3**

Solutions appear at back of book.

1. Why is the cyclically adjusted budget balance a better measure of whether government policies are sustainable in the long run than the actual budget balance?
2. Explain why states required by their constitutions to balance their budgets are likely to experience more severe economic fluctuations than states not held to that requirement.

**|| Long-Run Implications of Fiscal Policy**

At the end of 2009, the government of Greece ran into a financial wall. Like most other governments in Europe (and the U.S. government, too), the Greek government was running a large budget deficit, which meant that it needed to keep borrowing more funds, both to cover its expenses and to pay off existing loans as they came due. But governments, like countries or individuals, can only borrow if lenders believe it's likely that they will eventually be willing or able to repay their debts. By 2009 many lenders had lost faith in Greece's financial future, and were no longer willing to lend to the Greek government. Those few who were willing to lend demanded very high interest rates to compensate them for the risk of loss.

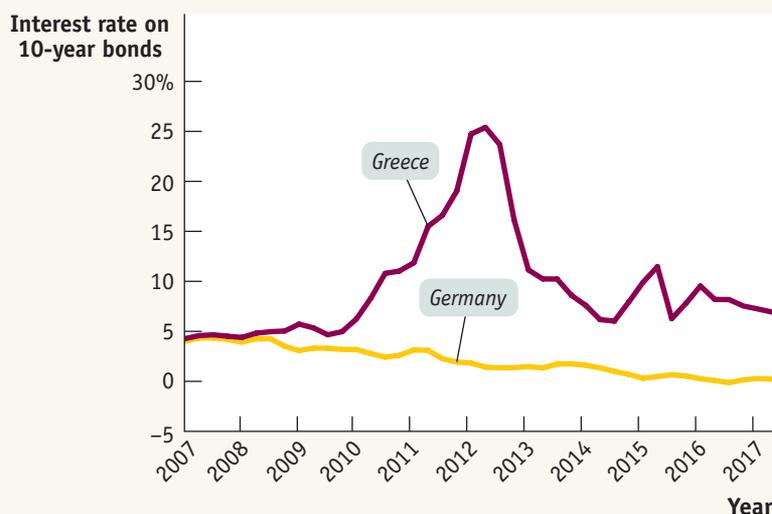
Figure 13-12 compares interest rates on 10-year bonds issued by the governments of Greece and Germany. At the beginning of 2007, Greece could borrow at almost the same rate as Germany, widely considered a very safe borrower. In 2009 its borrowing costs started to climb, and by the end of 2011 Greece had to pay an interest rate around 10 times the rate Germany paid.

What precipitated the crisis? In 2009 it became clear that the Greek government had used creative accounting to hide just how much debt it had already taken on. Government debt is, after all, a promise to make future payments to lenders. By 2010 it seemed likely that the Greek government had already promised more than it could possibly deliver.

**FIGURE 13-12 Greek and German Long-Term Interest Rates**

As late as 2008, the government of Greece could borrow at interest rates only slightly higher than those facing Germany, widely considered a very safe borrower. But in early 2009, as it became clear that both Greek debt and deficits were larger than previously reported, lenders lost confidence in the government's ability to repay its debts and sent Greek borrowing costs skyrocketing.

Data from: Federal Reserve Bank of St. Louis; OECD "Main Economic Indicators Complete Database."



Copyright © 2017 Worth Publishers. Distributed by Worth Publishers. Not for redistribution.

Lenders became deeply worried that the level of Greek government debt was unsustainable—that is, it was unlikely to repay what was owed. As a result, Greece found itself largely shut out of private debt markets. In order to prevent a government collapse, it received emergency loans from other European nations and the International Monetary Fund. But these loans came with the requirement that the Greek government undertake austerity, by making severe spending cuts and sharply raising taxes. Austerity in Greece wreaked havoc with the economy, imposed severe economic hardship on citizens, and led to massive social unrest.

The 2009 crisis in Greece shows why no discussion of fiscal policy is complete without taking into account the long-run implications of government budget surpluses and deficits, especially the implications for government debt. We now turn to those long-run implications.

## Deficits, Surpluses, and Debt

When a family spends more than it earns over the course of a year, it has to raise the extra funds either by selling assets or by borrowing. And if a family borrows year after year, it will eventually end up with a lot of debt.

The same is true for governments. With a few exceptions, governments don't raise large sums by selling assets such as national parkland. Instead, when a government spends more than the tax revenue it receives—when it runs a budget deficit—it almost always borrows the extra funds. And governments that run persistent budget deficits end up with substantial debts.

To interpret the numbers that follow, you need to know a slightly peculiar feature of federal government accounting. For historical reasons, the U.S. government does not keep books by calendar years. Instead, budget totals are kept by **fiscal years**, which run from October 1 to September 30 and are labeled by the calendar year in which they end. For example, fiscal 2016 began on October 1, 2015, and ended on September 30, 2016.

At the end of fiscal 2016, the U.S. federal government had total debt equal to \$19.5 trillion. However, part of that debt represented special accounting rules specifying that the federal government as a whole owes funds to certain government programs, especially Social Security. We'll explain those rules shortly. For now, however, let's focus on **public debt**: federal government debt held by individuals and institutions outside the government. At the end of fiscal 2016, the federal government's public debt was "only" \$14.1 trillion, or 76% of GDP. Federal public debt at the end of 2016 was larger than at the end of 2015 because the government ran a deficit in 2016: a government that runs persistent budget deficits will experience a rising level of public debt. Why is this a problem?

## Potential Dangers Posed by Rising Government Debt

There are two reasons to be concerned when a government runs persistent budget deficits that result in government debt that rises over time.

**1. Crowding Out** When the economy is at full employment and the government borrows funds in the financial markets, it is competing with firms that plan to borrow funds for investment spending. As a result, the government's borrowing may crowd out private investment spending, increasing interest rates and reducing the economy's long-run rate of growth.

**2. Financial Pressure and Default** Today's deficits, by increasing the government's debt, place financial pressure on future budgets. The impact of current

A **fiscal year** runs from October 1 to September 30 and is labeled according to the calendar year in which it ends.

**Public debt** is government debt held by individuals and institutions outside the government.

### PITFALLS

#### DEFICITS VERSUS DEBT

Confusing *deficits* with *debt* is a common mistake. Let's review the difference.

A *deficit* is the difference between the amount of money a government spends and the amount it receives in taxes over a given period—usually, though not always, a year. Deficit numbers always come with a statement about the time period to which they apply, as in "the U.S. budget deficit *in fiscal 2016* was \$587 billion."

A *debt* is the sum of money a government owes at a particular point in time. Debt numbers usually come with a specific date, as in "U.S. public debt *at the end of fiscal 2016* was \$14.1 trillion."

Deficits and debt are linked, because government debt grows when governments run deficits. But they aren't the same thing, and they can even tell different stories. For example, Italy, which found itself in debt trouble in 2011, had a fairly small deficit by historical standards, but it had very high debt, a legacy of past policies.

deficits on future budgets is straightforward. Like individuals, governments must pay their bills, including interest payments on their accumulated debt. When a government is deeply in debt, those interest payments can be substantial. In fiscal 2016, the U.S. federal government paid 1.3% of GDP, or \$241 billion, in interest on its debt. The more heavily indebted government of Italy paid interest of 4% of its GDP in 2016, according to estimates.

Other things equal, a government paying large sums in interest must raise more revenue from taxes or spend less than it would otherwise be able to afford—or it must borrow even more to cover the gap. And a government that borrows to pay interest on its outstanding debt pushes itself even deeper into debt. This process can eventually push a government to the point where lenders question its ability to repay. Like a consumer who has maxed out his or her credit cards, it will find that lenders are unwilling to lend any more funds. The result can be that the government defaults on its debt—it stops paying what it owes. Default is often followed by deep financial and economic turmoil.

Americans aren't used to the idea of government default, but it does happen. In the 1990s Argentina, a relatively high-income developing country, was widely praised for its economic policies—and it was able to borrow large sums from foreign lenders. By 2001, however, Argentina's interest payments were spiraling out of control, and the country defaulted. It eventually reached a settlement with most of its lenders under which it paid less than a third of the amount originally due.

Default creates havoc in a country's financial markets and badly shakes public confidence in both the government and the economy. Argentina's debt default was accompanied by a crisis in the country's banking system and a very severe recession. And even if a highly indebted government avoids default, a heavy debt burden typically forces it to slash spending or raise taxes, politically unpopular



## GLOBAL COMPARISON THE AMERICAN WAY OF DEBT

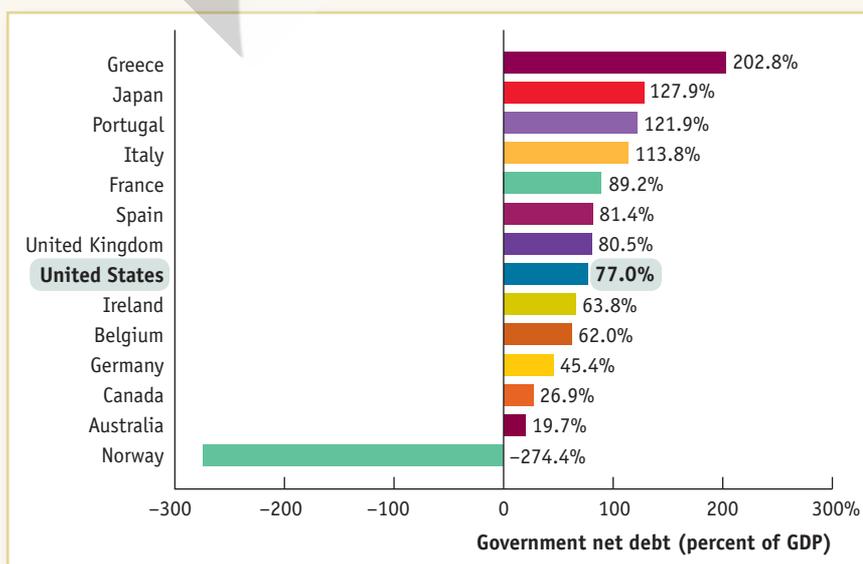
How does the public debt of the United States stack up internationally? In dollar terms, we're number one—but this isn't very informative, since the U.S. economy and so the government's tax base are much larger than those of all but a few other nations. A more informative comparison is the ratio of public debt to GDP.

The figure shows the *net public debt* of a number of rich countries as a percentage of GDP at the end of 2016. Net public debt is government debt minus any assets governments may have—an adjustment that can make a big difference. What you see here is that the United States is more or less in the middle of the pack.

It may not surprise you that Greece heads the list, and most of the other high net debt countries are European nations that have been making headlines for their debt problems. Interestingly, however, Japan is also high on the list because it has used massive public spending to prop up its economy ever since the 1990s. Investors, however, still consider Japan a reliable government, so its borrowing costs remain low despite high net debt.

In contrast to the other countries, Norway has a large *negative* net public debt

thanks to oil. Norway is one of the world's largest oil exporters. Instead of spending its oil revenues immediately, the government of Norway has used them to build up an investment fund for future needs following the lead of traditional oil producers like Saudi Arabia. As a result, Norway has a huge stock of government assets rather than a large government debt.



Data from: International Monetary Fund; World Economic Outlook, October 2016; Congressional Budget Office. Not for redistribution.

measures that can also damage the economy. In some cases, austerity measures intended to reassure lenders that the government can indeed pay end up depressing the economy so much that lender confidence continues to fall.

If it has its own currency, a government that has trouble borrowing can print money to pay its bills. But doing so can lead to another problem: inflation. In fact, budget problems are the main cause of very severe inflation. Governments do not want to find themselves in a position where the choice is between defaulting on their debts and inflating those debts away by printing money.

Concerns about the long-run effects of deficits need not rule out the use of expansionary fiscal policy to stimulate the economy when it is depressed. However, these concerns do mean that governments should try to offset budget deficits in bad years with budget surpluses in good years. In other words, governments should run a budget that is approximately balanced over time. Have they actually done so?

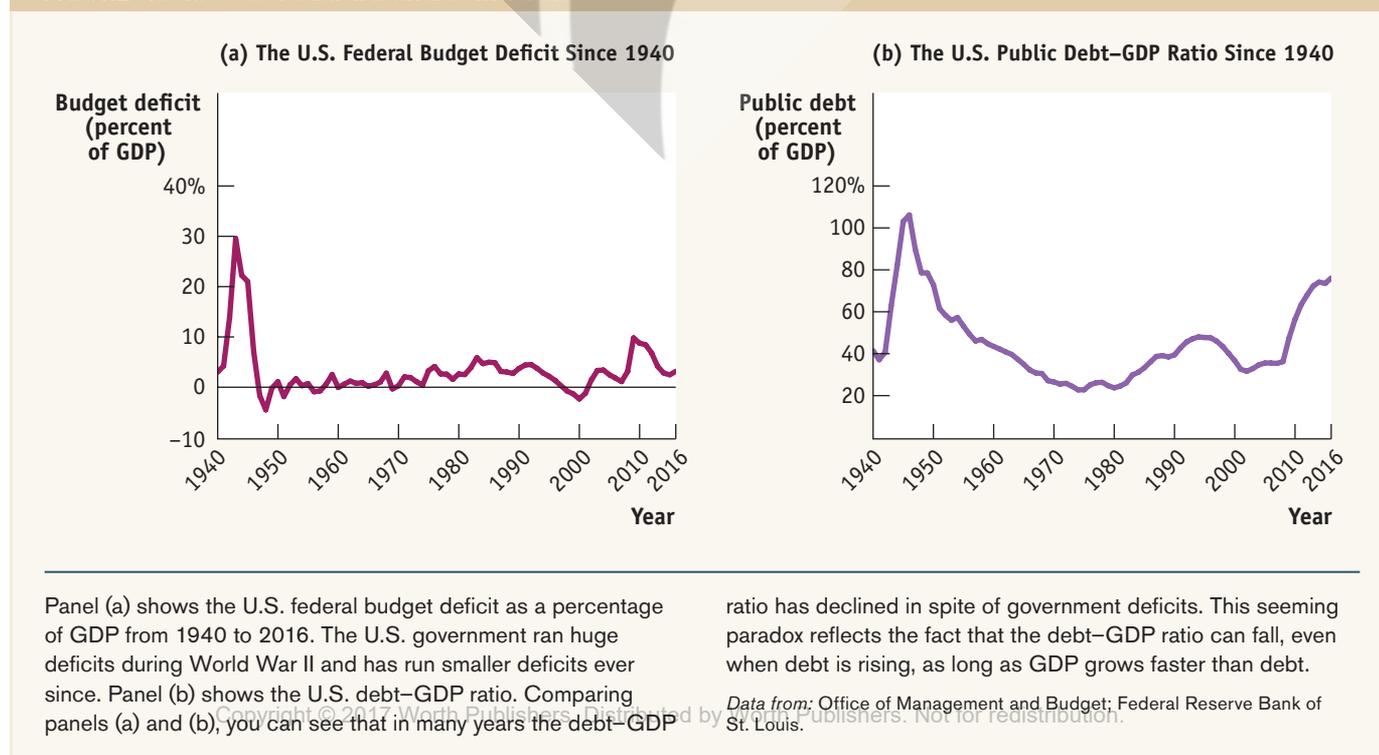
The **debt-GDP ratio** is the government's debt as a percentage of GDP.

### Deficits and Debt in Practice

Figure 13-13 shows the U.S. federal government's budget deficit and how its debt changed from 1940 to 2016. Panel (a) shows the federal deficit as a percentage of GDP. As you can see, the federal government ran huge deficits during World War II. It briefly ran surpluses after the war, but it has normally run deficits ever since, especially after 1980. This seems inconsistent with the advice that governments should offset deficits in bad times with surpluses in good times.

However, panel (b) of Figure 13-13 shows that for most of the period these persistent deficits didn't lead to runaway debt. To assess the ability of governments to pay their debt, we use the **debt-GDP ratio**, the government's debt as a percentage of GDP. We use this measure, rather than simply looking at the size of the debt, because GDP, which measures the size of the economy as a whole, is a good indicator of the potential taxes the government can collect. If the government's debt grows more slowly than GDP, the burden of paying that debt is actually falling compared with the government's potential tax revenue. Under these conditions

FIGURE 13-13 U.S. Federal Deficits and Debt



**FOR INQUIRING MINDS** What Happened to the Debt from World War II?

As you can see from Figure 13-13, the U.S. government paid for World War II by borrowing on a huge scale. By the war's end, the public debt was more than 100% of GDP, and many people worried about how it could ever be paid off.

The truth is that it never was paid off. In 1946 public debt was \$242 billion; that

number dipped slightly in the next few years, as the United States ran postwar budget surpluses, but the government budget went back into deficit in 1950 with the start of the Korean War. By 1962 the public debt was back up to \$248 billion.

But by that time nobody was worried about the fiscal health of the U.S.

government because the debt–GDP ratio had fallen by more than half. The reason? Vigorous economic growth, plus mild inflation, led to a rapid rise in GDP. The experience was a clear lesson in the peculiar fact that modern governments can run deficits forever, as long as they aren't too large.

the underlying economy is strong enough to generate future surpluses, allowing the government to pay off its debt, at a time of its own choosing, and avoid the potential dangers of financial pressure and default.

What we see from panel (b) is that although the federal debt grew in almost every year, the debt–GDP ratio fell for 30 years after the end of World War II. This shows that the debt–GDP ratio can fall, even when debt is rising, as long as GDP grows faster than debt. The accompanying For Inquiring Minds, explains how sufficiently high levels of growth and/or inflation can allow a government that runs persistent budget deficits to nevertheless have a declining debt–GDP ratio.

Still, a government that runs persistent *large* deficits will have a rising debt–GDP ratio when debt grows faster than GDP. In the aftermath of the financial crisis of 2008, the U.S. government began running deficits much larger than anything seen since World War II, and the debt–GDP ratio began rising sharply. Similar surges in the debt–GDP ratio could be seen in a number of other countries after 2008. Economists and policy makers agreed that this was not a sustainable trend, that governments would need to get their spending and revenues back in line.

### Implicit Liabilities

Looking at Figure 13-13, you might be tempted to conclude that until the 2008 crisis struck, the U.S. federal budget was in fairly decent shape: the return to budget deficits after 2001 caused the debt–GDP ratio to rise a bit, but that ratio was still low compared with both historical experience and some other wealthy countries. In fact, however, experts on long-run budget issues view the situation of the United States (and other countries such as Japan and Italy) with some alarm. The reason is the problem of *implicit liabilities*. **Implicit liabilities** are spending promises made by governments that are effectively a debt despite the fact that they are not included in the usual debt statistics.

The implicit liabilities of the U.S. government arise mainly from transfer programs that are aimed at providing security in retirement and protection from large health care bills:

- Social Security is the main source of retirement income for most older Americans.
- Medicare pays most of older Americans' medical costs.
- Medicaid provides health care to lower-income families.
- The Affordable Care Act subsidizes health insurance premiums for many low- to moderate-income families who are ineligible for Medicaid.

In each of these cases, the government has promised to provide transfer payments to future as well as current beneficiaries. So these programs represent a future debt that must be honored, even though the debt does not currently show up in the usual statistics. Together, these programs currently account for approximately half of federal spending.

**Implicit liabilities** are spending promises made by governments that are effectively a debt despite the fact that they are not included in the usual debt statistics.

The implicit liabilities created by these transfer programs worry fiscal experts. Figure 13-14 shows why. It shows actual 2016 spending on Social Security and major health care programs, measured as a percentage of GDP, together with Congressional Budget Office projections for spending in 2046. According to these projections, spending on Social Security will rise substantially over the next few decades and spending on the major health care programs will soar. Why?

In the case of Social Security, the answer is demography. Social Security is a pay-as-you-go system: current workers pay payroll taxes that fund the benefits of current retirees. So the ratio of the number of retirees drawing benefits to the number of workers paying into Social Security has a major impact on the system's finances.

There was a huge surge in the U.S. birth rate between 1946 and 1964, the years of what is commonly called the *baby boom*. Most baby boomers are currently of working age—which means they are paying taxes, not collecting benefits. But some are starting to retire, and as more and more of them do so, they will stop earning taxable income and start collecting benefits.

As a result, the ratio of retirees receiving benefits to workers paying into the Social Security system will rise. In 2016 there were 36 retirees receiving benefits for every 100 workers paying into the system. By 2046, according to the Social Security Administration, that number will rise to 47. So as baby boomers move into retirement, benefit payments will continue to rise relative to the size of the economy.

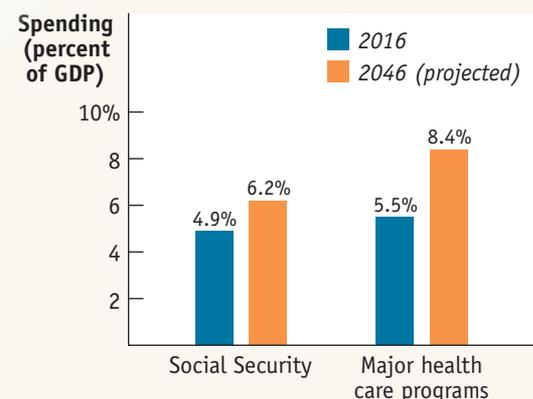
The aging of the baby boomers, by itself, poses only a moderately sized long-run fiscal problem. The projected rise in health care spending is a much more serious concern. These projections also reflect the aging of the population, both because more people will be eligible for Medicare and because older people tend to have higher medical costs. But the main story behind projections of higher health care spending is the long-run tendency of such spending to rise faster than overall spending, for both government-funded and privately funded health care.

To some extent, the implicit liabilities of the U.S. government are already reflected in debt statistics. We mentioned earlier that the government had a total debt of \$19.5 trillion at the end of fiscal 2016 but that only \$14.1 trillion of that total was owed to the public. The main explanation for that discrepancy is that both Social Security and part of Medicare (the hospital insurance program) are supported by *dedicated taxes*: their expenses are paid out of special taxes on wages. At times, these dedicated taxes yield more revenue than is needed to pay current benefits.

In particular, since the mid-1980s the Social Security system has been taking in more revenue than it currently needs in order to prepare for the retirement of the baby boomers. This surplus in the Social Security system has been used to accumulate a *Social Security trust fund*, which was \$2.8 trillion at the end of fiscal 2016.

The money in the trust fund is held in the form of U.S. government bonds, which are included in the \$19.5 trillion in total debt. You could say that there's something funny about counting bonds in the Social Security trust fund as part of government debt. After all, these bonds are owed by one part of the government (the government outside the Social Security system) to another part of the government (the Social Security system itself). But the debt corresponds to a real, if implicit, liability: promises by the government to pay future retirement benefits. So many economists argue that the gross debt of \$18.1 trillion, the sum of public debt and government debt held by Social Security and other trust funds, is a more accurate indication of the government's fiscal health than the smaller amount owed to the public alone.

**FIGURE 13-14 Future Demands on the Federal Budget**



This figure shows actual spending on social insurance programs as a percentage of GDP in 2016 and Congressional Budget Office projections for these same programs in 2046. Partly as a result of an aging population, these programs will become much more expensive over time. But, it is the significant increases in health care spending that will pose the most serious problem for the federal budget in the future.

Data from: Congressional Budget Office.

## ECONOMICS >> *in Action*

### Reducing Implicit Liabilities

As we've seen, implicit government liabilities are a lot like a hidden form of debt. But they do differ from ordinary debts in one important way: unlike debts, which

must be either repaid or defaulted on, implicit liabilities can be brought down by government policies that reduce future spending.

In fact, something like that has happened to U.S. implicit liabilities, where there has been a big change in the outlook since 2010, as shown in Table 13-2. The table compares two projections of the U.S. fiscal situation in 2035, made by the Congressional Budget Office (CBO) in 2010 and then in 2016. In 2010, the CBO's outlook (according to the most widely used scenario) was quite grim: rising spending on social insurance, the office suggested, would lead to soaring debt. By 2016 the outlook, though far from reassuring, was much less catastrophic: debt would rise to "only" 110% of GDP.

Why the change? As you can see in the table, it was mainly about health care costs. Projections for Social Security hadn't changed at all. However, after 2010 medical costs grew much more slowly than they had in previous years, leading the CBO to revise its expectations of future health care spending down.

But why did health costs grow more slowly? Part of the answer probably has to do with a variety of cost-control measures that were included in the Affordable Care Act, which expanded government aid to many of the previously uninsured. One measure, for example, offered hospitals rewards if they found ways to save the government money, and penalized them if patients were readmitted too frequently with the same problems. Individually, these measures may not sound like much, but many health economists believe that their combined effect has been substantial.

The lesson from this story is that while implicit liabilities are a very important issue, they don't necessarily mean that governments must raise taxes or reduce services. In some cases, these liabilities can be reduced by providing government services in a smarter, more efficient way.

**TABLE 13-2 Congressional Budget Office Budget Projections for 2035 (percent of GDP)**

Implicit liabilities	2010 projection	2016 projection
Social Security spending	6.2%	6.2%
Major health care programs	10.9%	7.3%
<b>Debt held by public</b>	<b>185%</b>	<b>110%</b>



The cost-control measures of the Affordable Care Act offer an example of how increased efficiency in the provision of government services lowers implicit liabilities.

#### >> Quick Review

- Large and persistent budget deficits lead to increases in **public debt**.
- Public debt that rises year after year can lead to financial pressure and government default. In less extreme cases, it can crowd out investment spending, reducing long-run growth. This suggests that budget deficits in bad **fiscal years** should be offset with budget surpluses in good fiscal years.
- However, if a country has rising GDP, economists believe it may safely run annual deficits as long as the **debt-GDP ratio** is stable or falling because GDP is growing faster than the debt.
- In addition to their official public debt, modern governments have implicit liabilities. The U.S. government has large **implicit liabilities** in the form of Social Security, Medicare, Medicaid, and the Affordable Care Act (ACA). With large implicit liabilities, a stable debt-GDP ratio may give a misleading sense of security.

#### >> Check Your Understanding 13-4

*Solutions appear at back of book.*

1. Explain how each of the following events would affect the public debt or implicit liabilities of the U.S. government, other things equal. Would the public debt or implicit liabilities be greater or smaller?
  - a. A higher growth rate of real GDP
  - b. Retirees live longer
  - c. A decrease in tax revenue
  - d. Government borrowing to pay interest on its current public debt
2. Suppose the economy is in a slump and the current public debt is quite large. Explain the trade-off of short-run versus long-run objectives that policy makers face when deciding whether or not to engage in deficit spending.
3. Explain how a contractionary fiscal policy like austerity can make it more likely that a government is unable to pay its debts.

Copyright © 2017 Worth Publishers. Distributed by Worth Publishers. Not for redistribution.

# Here Comes the Sun



The Solana power plant covers three square miles of the Arizona desert in Gila Bend, about 70 miles from Phoenix. Whereas most solar installations rely on photovoltaic panels that convert light directly into electricity, Solana uses a system of mirrors to concentrate the sun's heat on black pipes, which convey that heat to tanks of molten salt. The heat in the salt is, in

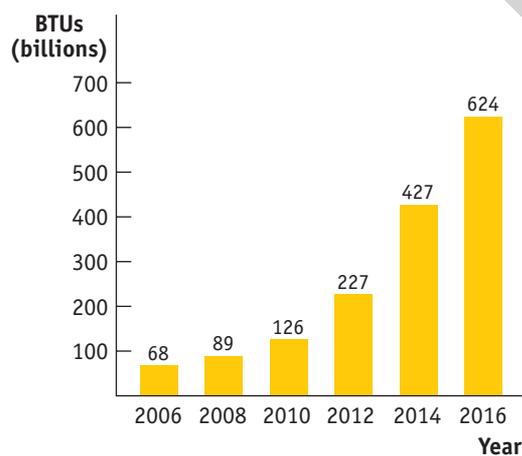
turn, used to generate electricity. The advantage of this arrangement is that the plant can keep generating power long after the sun has gone down, greatly enhancing its efficiency.

Solana is one of only a small number of concentrated thermal solar plants operating or under construction, and as Figure 13-15 shows, solar power has been rapidly rising in importance, with the amount of solar-generated electricity increasing over 800% between 2008 and 2016. There are a number of reasons for this sudden rise, but the 2009 stimulus—which put substantial sums into the promotion of green energy—was a major factor. Solana, in particular, was built by the Spanish company Abengoa with the aid of a \$1.45 billion federal loan guarantee. Abengoa also received \$1.2 billion for a similar plant in the Mojave Desert.

While Solana is a good example of stimulus spending at work, it is also a good example of why such spending tends to be politically difficult. There were many protests over federal loans to a non-American firm, although Abengoa had the necessary technology, and the construction jobs created by the project were, of course, in the United States. Also, the long-term financial viability of solar power projects depends in part on whether government subsidies and other policies favoring renewable energy will continue, which isn't certain.

In terms of the goals of the stimulus, however, Solana seems to have done what it was supposed to: it generated jobs at a time when borrowing was cheap and many construction workers were unemployed.

**FIGURE 13-15 The Solar Sunrise, 2006–2016**



Data from: U.S. Energy Information Administration.

### QUESTIONS FOR THOUGHT

1. How did the political reaction to government funding for the Solana project differ from the reaction to more conventional government spending projects such as roads and schools? What does the case tell us about how to assess the value of a fiscal stimulus project?
2. In the chapter we talked about the problem of lags in discretionary fiscal policy. What does the Solana case tell us about this issue?
3. Is the depth of a recession a good or a bad time to undertake an energy project? Why or why not?

## SUMMARY

1. The government plays a large role in the economy, collecting a large share of GDP in taxes and spending a large share both to purchase goods and services and to make transfer payments, largely for **social insurance**. *Fiscal policy* is the use of taxes, government transfers, or government purchases of goods and services to shift the aggregate demand curve.
2. Government purchases of goods and services directly affect aggregate demand, and changes in taxes and government transfers affect aggregate demand indirectly by changing households' disposable income. **Expansionary fiscal policy** shifts the aggregate demand curve rightward; **contractionary fiscal policy** shifts the aggregate demand curve leftward.
3. Only when the economy is at full employment is there potential for crowding out of private spending and private investment spending by expansionary fiscal policy. The argument that expansionary fiscal policy won't work because of Ricardian equivalence—that consumers will cut back spending today to offset expected future tax increases—appears to be untrue in practice. What is clearly true is that very active fiscal policy may make the economy less stable due to time lags in policy formulation and implementation.
4. Fiscal policy has a multiplier effect on the economy, the size of which depends on the fiscal policy. Except in the case of lump-sum taxes, taxes reduce the size of the multiplier. Expansionary fiscal policy leads to an increase in real GDP, and contractionary fiscal policy leads to a reduction in real GDP. Because part of any change in taxes or transfers is absorbed by savings in the first round of spending, changes in government purchases of goods and services have a more powerful effect on the economy than equal-sized changes in taxes or transfers.
5. Rules governing taxes—with the exception of **lump-sum taxes**—and some transfers act as **automatic stabilizers**, reducing the size of the multiplier and automatically reducing the size of fluctuations in the business cycle. In contrast, **discretionary fiscal policy** arises from deliberate actions by policy makers rather than from the business cycle.
6. Some of the fluctuations in the budget balance are due to the effects of the business cycle. In order to separate the effects of the business cycle from the effects of discretionary fiscal policy, governments estimate the **cyclically adjusted budget balance**, an estimate of the budget balance if the economy were at potential output.
7. U.S. government budget accounting is calculated on the basis of **fiscal years**. Persistently large budget deficits have long-run consequences because they lead to an increase in **public debt**. As a result, two potential dangers may arise: crowding out, which reduces long-run economic growth, and financial pressure leading to default, which brings economic and financial turmoil.
8. A widely used measure of fiscal health is the **debt-GDP ratio**. This number can remain stable or fall even in the face of persistent budget deficits if GDP rises over time. With large **implicit liabilities**, a stable debt-GDP ratio may give a misleading sense of security. The largest implicit liabilities of the U.S. government come from Social Security, Medicare, Medicaid, and the Affordable Care Act (ACA), the costs of which are increasing due to the aging of the population and rising medical costs.

## KEY TERMS

Social insurance, p. 384

Expansionary fiscal policy, p. 385

Contractionary fiscal policy, p. 385

Lump-sum taxes, p. 391

Automatic stabilizers, p. 392

Discretionary fiscal policy, p. 392

Cyclically adjusted budget balance,  
p. 396

Fiscal year, p. 399

Public debt, p. 399

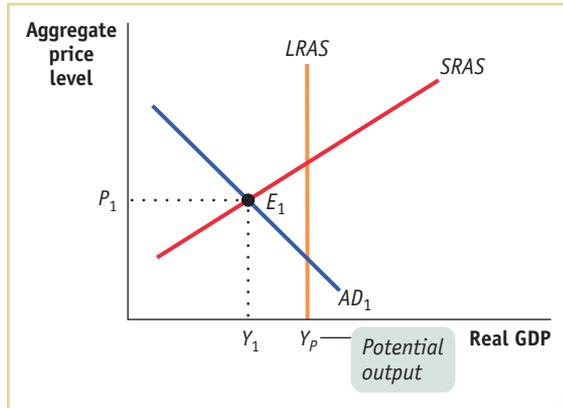
Debt-GDP ratio, p. 401

Implicit liabilities, p. 402

PROBLEMS

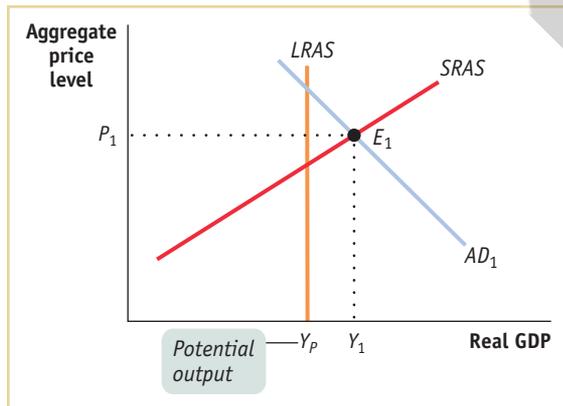
interactive activity

- The accompanying diagram shows the current macroeconomic situation for the economy of Albernia. You have been hired as an economic consultant to help the economy move to potential output,  $Y_p$ .



- Is Albernia facing a recessionary or inflationary gap?
- Which type of fiscal policy—expansionary or contractionary—would move the economy of Albernia to potential output,  $Y_p$ ? What are some examples of such policies?
- Illustrate the macroeconomic situation in Albernia with a diagram after the successful fiscal policy has been implemented.

- The accompanying diagram shows the current macroeconomic situation for the economy of Britannia; real GDP is  $Y_1$ , and the aggregate price level is  $P_1$ . You have been hired as an economic consultant to help the economy move to potential output,  $Y_p$ .

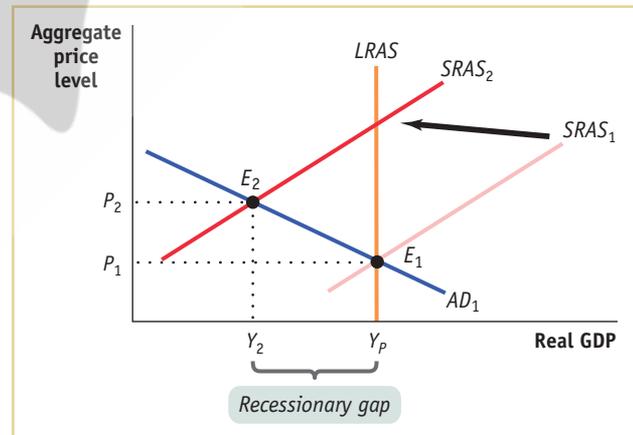


- Is Britannia facing a recessionary or inflationary gap?
- Which type of fiscal policy—expansionary or contractionary—would move the economy of Britannia to potential output,  $Y_p$ ? What are some examples of such policies?
- Illustrate the macroeconomic situation in Britannia with a diagram after the successful fiscal policy has been implemented.

- An economy is in long-run macroeconomic equilibrium when each of the following aggregate demand shocks occurs. What kind of gap—inflationary or recessionary—will the economy face after the shock, and what type of fiscal policies would help move the economy back to potential output? How would your recommended fiscal policy shift the aggregate demand curve?

- A stock market boom increases the value of stocks held by households.
- Firms come to believe that a recession in the near future is likely.
- Anticipating the possibility of war, the government increases its purchases of military equipment.
- The quantity of money in the economy declines and interest rates increase.

- During a 2008 interview, then German Finance Minister Peer Steinbrueck said, “We have to watch out that in Europe and beyond, nothing like a combination of downward economic [growth] and high inflation rates emerges—something that experts call stagflation.” Such a situation can be depicted by the movement of the short-run aggregate supply curve from its original position,  $SRAS_1$ , to its new position,  $SRAS_2$ , with the new equilibrium point  $E_2$  in the accompanying figure. In this question, we try to understand why stagflation is particularly hard to fix using fiscal policy.



- What would be the appropriate fiscal policy response to this situation if the primary concern of the government was to maintain economic growth? Illustrate the effect of the policy on the equilibrium point and the aggregate price level using the diagram.
- What would be the appropriate fiscal policy response to this situation if the primary concern of the government was to maintain price stability? Illustrate the effect of the policy on the equilibrium point and the aggregate price level using the diagram.
- Discuss the effectiveness of the policies in parts a and b in fighting stagflation.

Copyright © 2017 Worth Publishers. Distributed by Worth Publishers. Not for redistribution.

5. Show why a \$10 billion reduction in government purchases of goods and services will have a larger effect on real GDP than a \$10 billion reduction in government transfers by completing the accompanying table for an economy with a marginal propensity to consume (*MPC*) of 0.6. The first and second rows of the table are filled in for you: on the left side of the table, in the first row, the \$10 billion reduction in government purchases decreases real GDP and disposable income, *YD*, by \$10 billion, leading to a reduction in consumer spending of \$6 billion ( $MPC \times$  change in disposable income) in row 2. However, on the right side of the table, the \$10 billion reduction in transfers has no effect on real GDP in round 1 but does lower *YD* by \$10 billion, resulting in a decrease in consumer spending of \$6 billion in round 2.

a. When government purchases decrease by \$10 billion, what is the sum of the changes in real GDP after the 10 rounds?

Rounds	Decrease in <i>G</i> = -\$10 billion (billions of dollars)			Decrease in <i>TR</i> = -\$10 billion (billions of dollars)		
	Change in <i>G</i> or <i>C</i>	Change in real GDP	Change in <i>YD</i>	Change in <i>TR</i> or <i>C</i>	Change in real GDP	Change in <i>YD</i>
1	$\Delta G = -\$10.00$	-\$10.00	-\$10.00	$\Delta TR = -\$10.00$	-\$0.00	-\$10.00
2	$\Delta C = -6.00$	-6.00	-6.00	$\Delta C = -6.00$	-6.00	-6.00
3	$\Delta C = ?$	?	?	$\Delta C = ?$	?	?
4	$\Delta C = ?$	?	?	$\Delta C = ?$	?	?
5	$\Delta C = ?$	?	?	$\Delta C = ?$	?	?
6	$\Delta C = ?$	?	?	$\Delta C = ?$	?	?
7	$\Delta C = ?$	?	?	$\Delta C = ?$	?	?
8	$\Delta C = ?$	?	?	$\Delta C = ?$	?	?
9	$\Delta C = ?$	?	?	$\Delta C = ?$	?	?
10	$\Delta C = ?$	?	?	$\Delta C = ?$	?	?

b. When the government reduces transfers by \$10 billion, what is the sum of the changes in real GDP after the 10 rounds?

c. Using the formula for the multiplier for changes in government purchases and for changes in transfers, calculate the total change in real GDP due to the \$10 billion decrease in government purchases and the \$10 billion reduction in transfers. What explains the difference? [*Hint*: The multiplier for government purchases of goods and services is  $1/(1 - MPC)$ . But since each \$1 change in government transfers only leads to an initial change in real GDP of  $MPC \times \$1$ , the multiplier for government transfers is  $MPC/(1 - MPC)$ .]

6. In each of the following cases, either a recessionary or inflationary gap exists. Assume that the aggregate supply curve is horizontal, so that the change in real GDP arising from a shift of the aggregate demand curve equals the size of the shift of the curve. Calculate both the change in government purchases of goods and services and the change in government transfers necessary to close the gap.

- a. Real GDP equals \$100 billion, potential output equals \$160 billion, and the marginal propensity to consume is 0.75.
- b. Real GDP equals \$250 billion, potential output equals \$200 billion, and the marginal propensity to consume is 0.5.
- c. Real GDP equals \$180 billion, potential output equals \$100 billion, and the marginal propensity to consume is 0.8.

7. Most macroeconomists believe it is a good thing that taxes act as automatic stabilizers and lower the size of the multiplier. However, a smaller multiplier

means that the change in government purchases of goods and services, government transfers, or taxes needed to close an inflationary or recessionary gap is larger. How can you explain this apparent inconsistency?

- 8. The government’s budget surplus in Macroland has risen consistently over the past five years. Two government policy makers disagree as to why this has happened. One argues that a rising budget surplus indicates a growing economy; the other argues that it shows that the government is using contractionary fiscal policy. Can you determine which policy maker is correct? If not, why not?
- 9. Figure 13-10 shows the actual budget deficit and the cyclically adjusted budget deficit as a percentage of GDP in the United States from 1965 to 2016. Assuming that potential output was unchanged, use this figure to determine which of the years from 1990 to 2016 the government used expansionary fiscal policy and in which years it used contractionary fiscal policy.

10. You are an economic adviser to a candidate for national office. She asks you for a summary of the economic consequences of a balanced-budget rule for the federal government and for your recommendation on whether she should support such a rule. How do you respond?
11. In 2016, the policy makers of the economy of Eastlandia projected the debt–GDP ratio and the ratio of the budget deficit to GDP for the economy for the next 10 years under different scenarios for growth in the government’s deficit. Real GDP is currently \$1,000 billion per year and is expected to grow by 3% per year, the public debt is \$300 billion at the beginning of the year, and the deficit is \$30 billion in 2016.

Year	Real GDP (billions of dollars)	Debt (billions of dollars)	Budget deficit (billions of dollars)	Debt (percent of real GDP)	Budget deficit (percent of real GDP)
2016	\$1,000	\$300	\$30	?	?
2017	1,030	?	?	?	?
2018	1,061	?	?	?	?
2019	1,093	?	?	?	?
2020	1,126	?	?	?	?
2021	1,159	?	?	?	?
2022	1,194	?	?	?	?
2023	1,230	?	?	?	?
2024	1,267	?	?	?	?
2025	1,305	?	?	?	?
2026	1,344	?	?	?	?

- a. Complete the accompanying table to show the debt–GDP ratio and the ratio of the budget deficit to GDP for the economy if the government’s budget deficit remains constant at \$30 billion over the next 10 years. (Remember that the government’s debt will grow by the previous year’s deficit.)
- b. Redo the table to show the debt–GDP ratio and the ratio of the budget deficit to GDP for the economy if the government’s budget deficit grows by 3% per year over the next 10 years.
- c. Redo the table again to show the debt–GDP ratio and the ratio of the budget deficit to GDP for the economy if the government’s budget deficit grows by 20% per year over the next 10 years.
- d. What happens to the debt–GDP ratio and the ratio of the budget deficit to GDP for the economy over time under the three different scenarios?
12. Your study partner argues that the distinction between the government’s budget deficit and debt is similar to the distinction between consumer savings and wealth. He also argues that if you have large budget deficits, you must have a large debt. In what ways is your study partner correct and in what ways is he incorrect?

13.  Access the Discovering Data exercise for Chapter 13 online to answer these questions.
- a. Which of these six countries—United States, France, Italy, Greece, Germany, and United Kingdom—had the largest amount of government debt as a percent of GDP as of 2015? Which had the smallest?
- b. Calculate the percentage change in government debt from 2007 through 2015 for the same six countries. Which country experienced the largest percentage increase in government debt from 2007 through 2015? Which experienced the smallest?
- c. Using the six countries as a reference point, what conclusions can you draw about the relationship between government debt and economic growth?
14. In which of the following cases does the size of the government’s debt and the size of the budget deficit indicate potential problems for the economy?
- a. The government’s debt is relatively low, but the government is running a large budget deficit as it builds a high-speed rail system to connect the major cities of the nation.
- b. The government’s debt is relatively high due to a recently ended deficit-financed war, but the government is now running only a small budget deficit.
- c. The government’s debt is relatively low, but the government is running a budget deficit to finance the interest payments on the debt.
- d. The government’s debt is relatively high and the government is running a budget deficit to finance new infrastructure spending.
15. How did or would the following affect the current public debt and implicit liabilities of the U.S. government?
- a. In 2003, Congress passed and President Bush signed the Medicare Modernization Act, which provides seniors and individuals with disabilities with a prescription drug benefit. Some of the benefits under this law took effect immediately, but others will not begin until sometime in the future.
- b. The age at which retired persons can receive full Social Security benefits is raised to age 70 for future retirees.
- c. Social Security benefits for future retirees are limited to those with low incomes.
- d. Because the cost of health care is increasing faster than the overall inflation rate, annual increases in Social Security benefits are increased by the annual increase in health care costs rather than the overall inflation rate.
- e. The Affordable Care Act (ACA), which went into effect in 2014, created incentives for hospitals to find ways to save the government money.

16. Unlike households, governments are often able to sustain large debts. For example, in 2016, the U.S. government's total debt reached \$19.5 trillion, approximately equal to 106.1% of GDP. At the time, according to the U.S. Treasury, the average interest rate paid by the government on its debt was 1.3%. However, running budget deficits becomes hard when very large debts are outstanding.

- a. Calculate the dollar cost of the annual interest on the government's total debt assuming the interest rate and debt figures cited above.
- b. If the government operates on a balanced budget before interest payments are taken into account, at what rate must GDP grow in order for the debt-GDP ratio to remain unchanged?
- c. Calculate the total increase in national debt if the government incurs a deficit of \$600 billion in 2017.
- d. At what rate would nominal GDP have to grow in order for the debt-GDP ratio to remain unchanged when the deficit in 2017 is \$600 billion?
- e. Why is the debt-GDP ratio the preferred measure of a country's debt rather than the dollar value of the debt? Why is it important for a government to keep this number under control?

**WORK IT OUT** Interactive step-by-step help with solving this problem can be found online.

17. The accompanying table shows how consumers' marginal propensities to consume in a particular economy are related to their level of income.

Income range	Marginal propensity to consume
\$0–\$20,000	0.9
\$20,001–\$40,000	0.8
\$40,001–\$60,000	0.7
\$60,001–\$80,000	0.6
Above \$80,000	0.5

- a. Suppose the government engages in increased purchases of goods and services. For each of the income groups in the table, what is the value of the multiplier—that is, what is the “bang for the buck” from each dollar the government spends on government purchases of goods and services in each income group?
- b. If the government needed to close a recessionary or inflationary gap, at which group should it primarily aim its fiscal policy of changes in government purchases of goods and services?