Government Debt and Budget Deficits

Blessed are the young, for they shall inherit the national debt.

—Herbert Hoover

I think we ought to just go ahead and make "zillion" a real number. "Gazillion," too. A zillion could be ten million trillions, and a gazillion could be a trillion zillions. It seems to me it's time to do this.

—George Carlin

When a government spends more than it collects in taxes, it has a budget deficit, which it finances by borrowing from the private sector or from foreign governments. The accumulation of past borrowing is the government debt.

Debate about the appropriate amount of government debt in the United States is as old as the country itself. Alexander Hamilton believed that "a national debt, if it is not excessive, will be to us a national blessing," while James Madison argued that "a public debt is a public curse." Indeed, the location of the nation's capital was chosen as part of a deal in which the federal government assumed the Revolutionary War debts of the states: because the northern states had larger outstanding debts, the capital was located in the South.

The debate over government debt has been particularly fervent in recent years. In the aftermath of the financial crisis of 2008–2009, the U.S. government ran very large budget deficits. These deficits were in part attributable to automatic stabilizers: tax revenue falls and government spending on programs like unemployment insurance rises when the economy goes into recession. In addition, various discretionary changes in fiscal policy aimed at stimulating the economy further increased the budget deficit. In 2011, the federal government spent $3.8 trillion while receiving $2.2 trillion in tax revenue, resulting in a budget deficit of $1.6 trillion. As a percentage of GDP, the deficit was 11 percent, making it the largest budget shortfall since World War II.

This chapter considers various aspects of the debate over the economic effects of government debt. We begin by looking at the numbers. Section 19-1 examines the size of the U.S. government debt, comparing it to the historical

and international record. It also takes a brief look at what the future may hold. Section 19-2 discusses why measuring changes in government indebtedness is not as straightforward as it might seem.

We then look at how government debt affects the economy. Section 19-3 describes the traditional view of government debt, according to which government borrowing reduces national saving and crowds out capital accumulation. This view is held by most economists and has been implicit in the discussion of fiscal policy throughout this book. Section 19-4 discusses an alternative view, called *Ricardian equivalence*, which is held by a small but influential minority of economists. According to the Ricardian view, government debt does not influence national saving and capital accumulation. As we will see, the debate between the traditional and Ricardian views of government debt arises from disagreements over how consumers respond to the government's debt policy.

Section 19-5 then looks at other facets of the debate over government debt. It begins by discussing whether the government should always try to balance its budget and, if not, when a budget deficit or surplus is desirable. It also examines the effects of government debt on monetary policy, the political process, and a nation's role in the world economy.

Although this chapter provides the foundation for understanding the effects of government debt and budget deficits, the story will not be completed until the next chapter. There we will examine the financial system more broadly, including the causes of financial crises. As we will see, excessive government debt can be at the center of such crises—a lesson that several European nations have recently been learning, all too painfully.

19-1 The Size of the Government Debt

Let's begin by putting the government debt in perspective. In 2011, the debt of the U.S. federal government was $10.8 trillion. If we divide this number by 312 million, the number of people in the United States, we find that each person's share of the government debt was about $35,000. Obviously, this is not a trivial number; few people sneeze at $35,000. Yet if we compare this debt to the roughly $2 million a typical person will earn over his or her working life, the government debt does not look like the catastrophe it is sometimes made out to be.

One way to judge the size of a government's debt is to compare it to the amount of debt other countries have accumulated. Table 19-1 shows the amount of government debt for several major countries expressed as a percentage of each country's GDP. The figure here is net debt: the government's financial obligations less any financial assets that it holds. At the top of the list are the heavily indebted countries of Greece, Japan, and Italy, which have accumulated a debt that exceeds annual GDP. At the bottom are Switzerland and Australia, which have accumulated relatively small debts. The United States is more indebted than average, but it is not far from the middle of the pack. By international standards, the U.S. government is neither especially profligate nor especially frugal.

TABLE 19-1

How Indebted Are the World's Governments?

Country	Government Debt as a Percentage of GDP
Greece	133.1
Japan	127.6
Italy	100.2
Belgium	80.4
Portugal	75.8
United States	73.8
France	62.7
United Kingdom	61.7
Germany	51.5
Spain	45.6
Netherlands	37.7
Canada	33.6
Australia	4.9
Switzerland	0.4

Source: OECD Economic Outlook. Data are net financial liabilities as a percent of GDP for 2011.

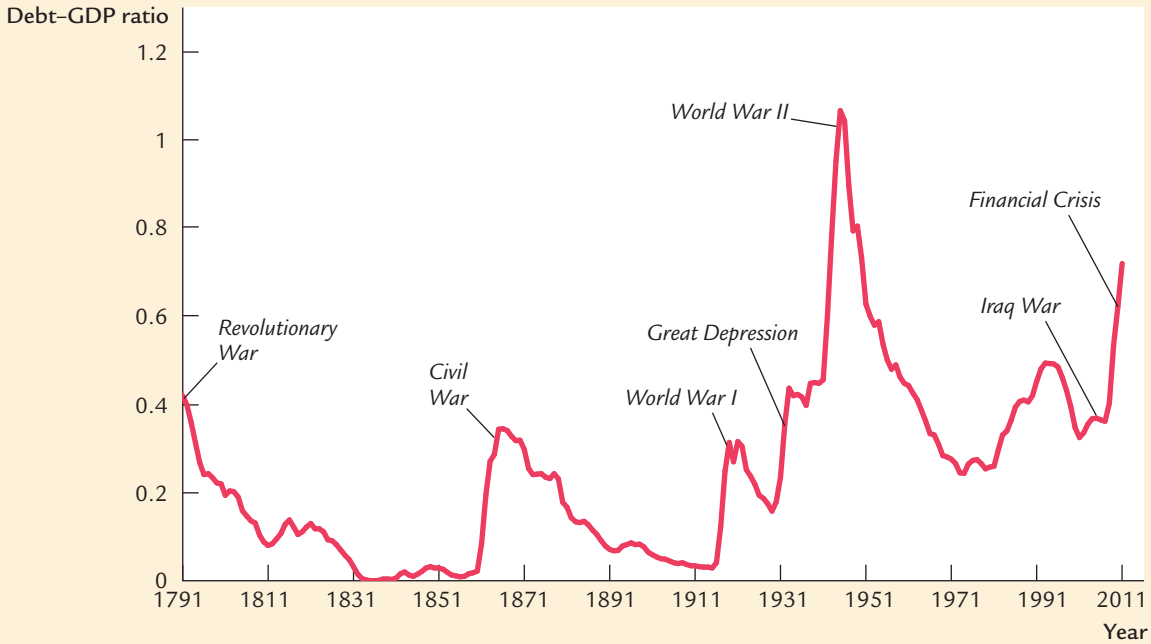
Over the course of U.S. history, the indebtedness of the federal government has varied substantially. Figure 19-1 shows the ratio of the federal debt to GDP since 1791. The government debt, relative to the size of the economy, varies from close to zero in the 1830s to a maximum of 107 percent of GDP in 1945.

Historically, the primary cause of increases in the government debt is war. The debt–GDP ratio rises sharply during major wars and falls slowly during peacetime. Many economists think that this historical pattern is the appropriate way to run fiscal policy. As we will discuss more fully later in this chapter, deficit financing of wars appears optimal for reasons of both tax smoothing and generational equity.

One instance of a large increase in government debt in peacetime began in the early 1980s. When Ronald Reagan was elected president in 1980, he was committed to reducing taxes and increasing military spending. These policies, coupled with a deep recession attributable to tight monetary policy, began a long period of substantial budget deficits. The government debt expressed as a percentage of GDP roughly doubled from 26 percent in 1980 to 50 percent in 1995. The United States had never before experienced such a large increase in government debt during a period of peace and prosperity. Many economists have criticized this increase in government debt as imposing an unjustifiable burden on future generations.

The increase in government debt during the 1980s caused significant concern among many policymakers as well. The first President Bush raised taxes to reduce the deficit, breaking his "Read my lips: No new taxes" campaign pledge

FIGURE 19-1



The Ratio of Government Debt to GDP Since 1790 The U.S. federal government debt held by the public, relative to the size of the U.S. economy, rises sharply during wars and declines slowly during peacetime. A major exception is the period from 1980 to 1995, when the ratio of debt to GDP rose without the occurrence of a major military conflict.

Sources: U.S. Department of the Treasury, U.S. Department of Commerce, and T. S. Berry, "Production and Population Since 1789," Bostwick Paper No. 6, Richmond, 1988.

and, according to some political commentators, costing him reelection. In 1993, when President Clinton took office, he raised taxes yet again. These tax increases, together with spending restraint and rapid economic growth due to the information-technology boom, caused the budget deficits to shrink and eventually turn into budget surpluses. The government debt fell from 50 percent of GDP in 1995 to 33 percent in 2001.

When President George W. Bush took office in 2001, the high-tech boom in the stock market was reversing course, and the economy was heading into recession. Economic downturns automatically cause tax revenue to fall and push the budget toward deficit. In addition, tax cuts to combat the recession and increased spending for homeland security and wars in Afghanistan and Iraq further increased the budget deficit, which averaged about 3 percent of GDP during his tenure. From 2001 to 2008, government debt rose from 33 to 41 percent of GDP.

When President Barack Obama moved into the White House in 2009, the economy was in the midst of a deep recession. Tax revenues were declining as the economy shrank. In addition, one of the new president's first actions was to sign a large fiscal stimulus to prop up the aggregate demand for goods and services.

(A Case Study in Chapter 11 examines this policy.) The federal government's budget deficit was 10 percent of GDP in 2009, 9 percent in 2010, and 11 percent in 2011. The debt–GDP ratio rose to 72 percent of GDP in 2011 and was projected to continue rising, at least in the near term.

These trends led to a significant event in August 2011: Standard & Poor's, a major private agency that evaluates the safety of bonds, reduced its credit rating on U.S. government debt to one notch below the top AAA grade. For many years, U.S. government debt was considered the safest around. That is, buyers of these bonds could be completely confident that they would be repaid in full when the bond matured. Standard & Poor's, however, was sufficiently concerned about recent fiscal policy that it raised the possibility that the U.S. government might someday default.

CASE STUDY

The Troubling Long-Term Outlook for Fiscal Policy

Why did Standard & Poor's downgrade U.S. government debt? The large budget deficits from 2009 to 2011 were one reason but probably not the main one. More important was the longer-term outlook for fiscal policy. When economists project the path of U.S. fiscal policy over the next several decades, they paint a troubling picture.

One reason is demographic. Advances in medical technology have been increasing life expectancy, while improvements in birth-control techniques and changing social norms have reduced the number of children people have. Because of these developments, the elderly are becoming a larger share of the population. In 1950, the elderly population (aged 65 and older) was about 14 percent the size of the working-age population (aged 20 to 64). Now the elderly are about 21 percent of the working-age population, and that figure will rise to about 40 percent in 2050. About one-third of the federal budget is devoted to providing the elderly with pensions (mainly through the Social Security program) and health care. As more people become eligible for these "entitlements," as they are sometimes called, government spending will automatically rise over time.

A second, related reason for the troubling fiscal picture is the rising cost of health care. The government provides health care to the elderly through the Medicare system and to the poor through Medicaid. As the cost of health care increases, government spending on these programs increases as well. Policymakers have proposed various ways to stem the rise in health care costs, such as reducing the burden of lawsuits, encouraging more competition among health care providers, and promoting greater use of information technology. The health care reform act signed into law by President Obama in 2009 established a new government agency, called the Independent Payment Advisory Board, to promulgate changes in Medicare to reduce costs. Yet many health economists believe such measures will have only limited impact. A main reason for rising health care costs is medical advances that provide new, better, but often expensive ways to extend and improve our lives.

The combination of the aging population and rising health care costs will have a major impact on the federal budget. Government spending on Social Security, Medicare, and Medicaid has already risen from less than 1 percent of GDP in 1950 to about 9 percent today. The upward trajectory is not about to stop. The Congressional Budget Office estimates that if no changes are made, spending on these programs will rise to about 20 percent of GDP over the next half century.

How the United States will handle these spending pressures is an open question. The key issue is how the required fiscal adjustment will be split between tax increases and spending reductions. Some economists believe that to pay for these commitments, we will need to raise taxes as a percentage of GDP substantially above what it has been historically. Given the projected increases in spending on Social Security, Medicare, and Medicaid, paying for these benefits would require increasing all taxes by approximately one-third. Other economists believe that such high tax rates would impose too great a cost on younger workers. They believe that policymakers should reduce the promises now being made to the elderly of the future and that, at the same time, people should be encouraged to take a greater role in providing for themselves as they age. This might entail increasing the normal retirement age, while giving people more incentive to save during their working years as preparation for assuming their own retirement and health costs.

Resolving this debate will be one of the great policy challenges in the decades ahead. Neither substantial tax hikes nor substantial spending cuts are politically popular, which is why the problem has not been addressed already. Yet the only alternative is a continuation of large budget deficits and increasing government debt. At some point, as government debt rises as a share of GDP, the government's ability or willingness to service and repay these debts would be called into question. And that is the main reason why Standard & Poor's, looking ahead to these formidable challenges, downgraded the credit rating of the U.S. government. They did not say that default was a likely outcome, but they did suggest that it was a possibility. ■

19-2 Problems in Measurement

The government budget deficit equals government spending minus government revenue, which in turn equals the amount of new debt the government needs to issue to finance its operations. This definition may sound simple enough, but in fact debates over fiscal policy sometimes arise over how the budget deficit should be measured. Some economists believe that the deficit as currently measured is not a good indicator of the stance of fiscal policy. That is, they believe that the budget deficit does not accurately gauge either the impact of fiscal policy on today's economy or the burden being placed on future generations of taxpayers. In this section we discuss four problems with the usual measure of the budget deficit.

Measurement Problem 1: Inflation

The least controversial of the measurement issues is the correction for inflation. Almost all economists agree that the government's indebtedness should be measured in real terms, not in nominal terms. The measured deficit should equal the change in the government's real debt, not the change in its nominal debt.

The budget deficit as commonly measured, however, does not correct for inflation. To see how large an error this induces, consider the following example. Suppose that the real government debt is not changing; in other words, in real terms, the budget is balanced. In this case, the nominal debt must be rising at the rate of inflation. That is,

$$\Delta D/D = \pi,$$

where π is the inflation rate and D is the stock of government debt. This implies

$$\Delta D = \pi D.$$

The government would look at the change in the nominal debt ΔD and would report a budget deficit of πD. Hence, most economists believe that the reported budget deficit is overstated by the amount πD.

We can make the same argument in another way. The deficit is government expenditure minus government revenue. Part of expenditure is the interest paid on the government debt. Expenditure should include only the real interest paid on the debt rD, not the nominal interest paid iD. Because the difference between the nominal interest rate i and the real interest rate r is the inflation rate π, the budget deficit is overstated by πD.

This correction for inflation can be large, especially when inflation is high, and it can often change our evaluation of fiscal policy. For example, in 1979, the federal government reported a budget deficit of $28 billion. Inflation was 8.6 percent, and the government debt held at the beginning of the year by the public (excluding the Federal Reserve) was $495 billion. The deficit was therefore overstated by

$$\begin{aligned} \pi D &= 0.086 \times \$495 \text{ billion} \\ &= \$43 \text{ billion}. \end{aligned}$$

Corrected for inflation, the reported budget deficit of $28 billion turns into a budget surplus of $15 billion! In other words, even though nominal government debt was rising, real government debt was falling.

Measurement Problem 2: Capital Assets

Many economists believe that an accurate assessment of the government's budget deficit requires taking into account the government's assets as well as its liabilities. In particular, when measuring the government's overall indebtedness, we should subtract government assets from government debt. Therefore, the budget deficit should be measured as the change in debt minus the change in assets.

Certainly, individuals and firms treat assets and liabilities symmetrically. When a person borrows to buy a house, we do not say that he is running a budget deficit. Instead, we offset the increase in assets (the house) against the increase in debt (the mortgage) and record no change in net wealth. Perhaps we should treat the government's finances the same way.

A budget procedure that accounts for assets as well as liabilities is called **capital budgeting** because it takes into account changes in capital. For example, suppose that the government sells one of its office buildings or some of its land and uses the proceeds to reduce the government debt. Under current budget procedures, the reported deficit would be lower. Under capital budgeting, the revenue received from the sale would not lower the deficit because the reduction in debt would be offset by a reduction in assets. Similarly, under capital budgeting, government borrowing to finance the purchase of a capital good would not raise the deficit.

The major difficulty with capital budgeting is that it is hard to decide which government expenditures should count as capital expenditures. For example, should the interstate highway system be counted as an asset of the government? If so, what is its value? What about the stockpile of nuclear weapons? Should spending on education be treated as expenditure on human capital? These difficult questions must be answered if the government is to adopt a capital budget.

Economists and policymakers disagree about whether the federal government should use capital budgeting. (Many state governments already use it.) Opponents of capital budgeting argue that, although the system is superior in principle to the current system, it is too difficult to implement in practice. Proponents of capital budgeting argue that even an imperfect treatment of capital assets would be better than ignoring them altogether.

Measurement Problem 3: Uncounted Liabilities

Some economists argue that the measured budget deficit is misleading because it excludes some important government liabilities. For example, consider the pensions of government workers. These workers provide labor services to the government today, but part of their compensation is deferred to the future. In essence, these workers are providing a loan to the government. Their future pension benefits represent a government liability not very different from government debt. Yet this liability is not included as part of the government debt, and the accumulation of this liability is not included as part of the budget deficit. According to some estimates, this implicit liability is almost as large as the official government debt.

Similarly, consider the Social Security system. In some ways, the system is like a pension plan. People pay some of their income into the system when young and expect to receive benefits when old. Perhaps accumulated future Social Security benefits should be included in the government's liabilities. Estimates suggest that the government's future Social Security liabilities (less future Social Security taxes) are more than three times the government debt as officially measured.

One might argue that Social Security liabilities are different from government debt because the government can change the laws determining Social Security benefits. Yet, in principle, the government could always choose not to repay all of its debt: the government honors its debt only because it chooses to do so. Promises to pay the holders of government debt may not be fundamentally different from promises to pay the future recipients of Social Security.

A particularly difficult form of government liability to measure is the *contingent liability*—the liability that is due only if a specified event occurs. For example, the government guarantees many forms of private credit, such as student loans, mortgages for low- and moderate-income families, and deposits in banks and savings-and-loan institutions. If the borrower repays the loan, the government pays nothing; if the borrower defaults, the government makes the repayment. When the government provides this guarantee, it undertakes a liability contingent on the borrower's default. Yet this contingent liability is not reflected in the budget deficit, in part because it is not clear what dollar value to attach to it.

Measurement Problem 4: The Business Cycle

Many changes in the government's budget deficit occur automatically in response to a fluctuating economy. When the economy goes into a recession, incomes fall, so people pay less in personal income taxes. Profits fall, so corporations pay less in corporate income taxes. Fewer people are employed, so payroll tax revenue declines. More people become eligible for government assistance, such as welfare and unemployment insurance, so government spending rises. Even without any change in the laws governing taxation and spending, the budget deficit increases.

These automatic changes in the deficit are not errors in measurement because the government truly borrows more when a recession depresses tax revenue and boosts government spending. But these changes do make it more difficult to use the deficit to monitor changes in fiscal policy. That is, the deficit can rise or fall either because the government has changed policy or because the economy has changed direction. For some purposes, it would be good to know which is occurring.

To solve this problem, the government calculates a **cyclically adjusted budget deficit** (sometimes called the *full-employment budget deficit*). The cyclically adjusted deficit is based on estimates of what government spending and tax revenue would be if the economy were operating at its natural level of output and employment. The cyclically adjusted deficit is a useful measure because it reflects policy changes but not the current stage of the business cycle.

Summing Up

Economists differ in the importance they place on these measurement problems. Some believe that the problems are so severe that the budget deficit as normally measured is almost meaningless. Most take these measurement problems seriously but still view the measured budget deficit as a useful indicator of fiscal policy.

The undisputed lesson is that to fully evaluate what fiscal policy is doing, economists and policymakers must look at more than just the measured budget deficit. And, in fact, they do. The budget documents prepared annually by the Office of Management and Budget contain much detailed information about the government's finances, including data on capital expenditures and credit programs.

No economic statistic is perfect. Whenever we see a number reported in the media, we need to know what it is measuring and what it is leaving out. This is especially true for data on government debt and budget deficits.

19-3 The Traditional View of Government Debt

Imagine that you are an economist working for the Congressional Budget Office (CBO). You receive a letter from the chair of the Senate Budget Committee:

> Dear CBO Economist:
>
> Congress is about to consider the president's request to cut all taxes by 20 percent. Before deciding whether to endorse the request, my committee would like your analysis. We see little hope of reducing government spending, so the tax cut would mean an increase in the budget deficit. How would the tax cut and budget deficit affect the economy and the economic well-being of the country?
>
> Sincerely,
> Committee Chair

Before responding to the senator, you open your favorite economics textbook—this one, of course—to see what the models predict for such a change in fiscal policy.

To analyze the long-run effects of this policy change, you turn to the models in Chapters 3 through 9. The model in Chapter 3 shows that a tax cut stimulates consumer spending and reduces national saving. The reduction in saving raises the interest rate, which crowds out investment. The Solow growth model introduced in Chapter 8 shows that lower investment eventually leads to a lower steady-state capital stock and a lower level of output. Because we concluded in Chapter 9 that the U.S. economy has less capital than in the Golden Rule steady state (the steady state with maximum consumption), the fall in steady-state capital means lower consumption and reduced economic well-being.

To analyze the short-run effects of the policy change, you turn to the *IS–LM* model in Chapters 11 and 12. This model shows that a tax cut stimulates consumer spending, which implies an expansionary shift in the *IS* curve. If there is no change in monetary policy, the shift in the *IS* curve leads to an expansionary shift in the aggregate demand curve. In the short run, when prices are sticky, the expansion in aggregate demand leads to higher output and lower unemployment.

Over time, as prices adjust, the economy returns to the natural level of output, and the higher aggregate demand results in a higher price level.

To see how international trade affects your analysis, you turn to the open-economy models in Chapters 6 and 13. The model in Chapter 6 shows that when national saving falls, people start financing investment by borrowing from abroad, causing a trade deficit. Although the inflow of capital from abroad lessens the effect of the fiscal-policy change on U.S. capital accumulation, the United States becomes indebted to foreign countries. The fiscal-policy change also causes the dollar to appreciate, which makes foreign goods cheaper in the United States and domestic goods more expensive abroad. The Mundell–Fleming model in Chapter 13 shows that the appreciation of the dollar and the resulting fall in net exports reduce the short-run expansionary impact of the fiscal change on output and employment.

With all these models in mind, you draft a response:

> Dear Senator:
>
> A tax cut financed by government borrowing would have many effects on the economy. The immediate impact of the tax cut would be to stimulate consumer spending. Higher consumer spending affects the economy in both the short run and the long run.
>
> In the short run, higher consumer spending would raise the demand for goods and services and thus raise output and employment. Interest rates would also rise, however, as investors competed for a smaller flow of saving. Higher interest rates would discourage investment and would encourage capital to flow in from abroad. The dollar would rise in value against foreign currencies, and U.S. firms would become less competitive in world markets.
>
> In the long run, the smaller national saving caused by the tax cut would mean a smaller capital stock and a greater foreign debt. Therefore, the output of the nation would be smaller, and a greater share of that output would be owed to foreigners.
>
> The overall effect of the tax cut on economic well-being is hard to judge. Current generations would benefit from higher consumption and higher employment, although inflation would likely be higher as well. Future generations would bear much of the burden of today's budget deficits: they would be born into a nation with a smaller capital stock and a larger foreign debt.
>
> Your faithful servant,
> CBO Economist

The senator replies:

> Dear CBO Economist:
>
> Thank you for your letter. It made sense to me. But yesterday my committee heard testimony from a prominent economist who called herself a "Ricardian" and who reached quite a different conclusion. She said that a tax cut by itself would not stimulate consumer spending. She concluded that the budget deficit would therefore not have all the effects you listed. What's going on here?
>
> Sincerely,
> Committee Chair

After studying Section 19-4, you write back to the senator, explaining in detail the debate over Ricardian equivalence.

F Y I

Taxes and Incentives

Throughout this book we have summarized the tax system with a single variable, *T*. In our models, the policy instrument is the level of taxation that the government chooses; we have ignored the issue of how the government raises this tax revenue. In practice, however, taxes are not lump-sum payments but are levied on some type of economic activity. The U.S. federal government raises some revenue by taxing personal income (45 percent of tax revenue), some by taxing payrolls (36 percent), some by taxing corporate profits (12 percent), and some from other sources (7 percent).

Courses in public finance spend much time studying the pros and cons of alternative types of taxes. One lesson emphasized in such courses is that taxes affect incentives. When people are taxed on their labor earnings, they have less incentive to work hard. When people are taxed on the income from owning capital, they have less incentive to save and invest in capital. As a result, when taxes change, incentives change, and this can have macroeconomic effects. If lower tax rates encourage increased work and investment, the aggregate supply of goods and services increases.

Some economists, called *supply-siders*, believe that the incentive effects of taxes are large. Some supply-siders go so far as to suggest that tax cuts can be self-financing: a cut in tax rates induces such a large increase in aggregate supply that tax revenue increases, despite the fall in tax rates. Although all economists agree that taxes affect incentives and that incentives affect aggregate supply to some degree, most believe that the incentive effects are not large enough to make tax cuts self-financing in most circumstances.

In recent years, there has been much debate about how to reform the tax system to reduce the disincentives that impede the economy from reaching its full potential. A proposal endorsed by many economists is to move from the current income tax system toward a consumption tax. Compared to an income tax, a consumption tax would provide more incentives for saving, investment, and capital accumulation. One way of taxing consumption would be to expand the availability of tax-advantaged saving accounts, such as individual retirement accounts and 401(k) plans, which exempt saving from taxation until that saving is later withdrawn and spent. Another way of taxing consumption would be to adopt a value-added tax, a tax on consumption paid by producers rather than consumers, now used by many European countries to raise government revenue.[1]

19-4 The Ricardian View of Government Debt

The traditional view of government debt presumes that when the government cuts taxes and runs a budget deficit, consumers respond to their higher after-tax income by spending more. An alternative view, called **Ricardian equivalence**,

[1]To read more about how taxes affect the economy through incentives, the best place to start is an undergraduate textbook in public finance, such as Harvey Rosen and Ted Gayer, *Public Finance*, 8th ed. (New York: McGraw-Hill, 2007). In the more advanced literature that links public finance and macroeconomics, a classic reference is Christophe Chamley, "Optimal Taxation of Capital Income in a General Equilibrium Model With Infinite Lives," *Econometrica* 54 (May 1986): 607–622. Chamley establishes conditions under which the tax system should not distort the incentive to save (that is, conditions under which consumption taxation is superior to income taxation). The robustness of this conclusion is investigated in Andrew Atkeson, V. V. Chari, and Patrick J. Kehoe, "Taxing Capital Income: A Bad Idea," *Federal Reserve Bank of Minneapolis Quarterly Review* 23 (Summer 1999): 3–17.

questions this presumption. According to the Ricardian view, consumers are forward-looking and, therefore, base their spending decisions not only on their current income but also on their expected future income. As we explored more fully in Chapter 16, the forward-looking consumer is at the heart of many modern theories of consumption. The Ricardian view of government debt applies the logic of the forward-looking consumer to analyzing the effects of fiscal policy.

The Basic Logic of Ricardian Equivalence

Consider the response of a forward-looking consumer to the tax cut that the Senate Budget Committee is considering. The consumer might reason as follows:

> The government is cutting taxes without any plans to reduce government spending. Does this policy alter my set of opportunities? Am I richer because of this tax cut? Should I consume more?
>
> Maybe not. The government is financing the tax cut by running a budget deficit. At some point in the future, the government will have to raise taxes to pay off the debt and accumulated interest. So the policy really represents a tax cut today coupled with a tax hike in the future. The tax cut merely gives me transitory income that eventually will be taken back. I am not any better off, so I will leave my consumption unchanged.

The forward-looking consumer understands that government borrowing today means higher taxes in the future. A tax cut financed by government debt does not reduce the tax burden; it merely reschedules it. It therefore should not encourage the consumer to spend more.

One can view this argument another way. Suppose that the government borrows $1,000 from the typical citizen to give that citizen a $1,000 tax cut. In essence, this policy is the same as giving the citizen a $1,000 government bond as a gift. One side of the bond says, "The government owes you, the bondholder, $1,000 plus interest." The other side says, "You, the taxpayer, owe the government $1,000 plus interest." Overall, the gift of a bond from the government to the typical citizen does not make the citizen richer or poorer because the value of the bond is offset by the value of the future tax liability.

The general principle is that government debt is equivalent to future taxes, and if consumers are sufficiently forward-looking, future taxes are equivalent to current taxes. Hence, financing the government by debt is equivalent to financing it by taxes. This view is called *Ricardian equivalence* after the famous nineteenth-century economist David Ricardo because he first noted the theoretical argument.

The implication of Ricardian equivalence is that a debt-financed tax cut leaves consumption unaffected. Households save the extra disposable income to pay the future tax liability that the tax cut implies. This increase in private saving exactly offsets the decrease in public saving. National saving—the sum of private and public saving—remains the same. The tax cut therefore has none of the effects that the traditional analysis predicts.

The logic of Ricardian equivalence does not mean that all changes in fiscal policy are irrelevant. Changes in fiscal policy do influence consumer spending if they influence present or future government purchases. For example, suppose that

the government cuts taxes today because it plans to reduce government purchases in the future. If the consumer understands that this tax cut does not require an increase in future taxes, he feels richer and raises his consumption. But note that it is the reduction in government purchases, rather than the reduction in taxes, that stimulates consumption: the announcement of a future reduction in government purchases would raise consumption today even if current taxes were unchanged because it would imply lower taxes at some time in the future.

Consumers and Future Taxes

The essence of the Ricardian view is that when people choose their level of consumption, they rationally look ahead to the future taxes implied by government debt. But how forward-looking are consumers? Defenders of the traditional view of government debt believe that the prospect of future taxes does not have as large an influence on current consumption as the Ricardian view assumes. Here are some of their arguments.[2]

Myopia Proponents of the Ricardian view of fiscal policy assume that people are rational when making such decisions as choosing how much of their income to consume and how much to save. When the government borrows to pay for current spending, rational consumers look ahead to the future taxes required to support this debt. Thus, the Ricardian view presumes that people have substantial knowledge and foresight.

One possible argument for the traditional view of tax cuts is that people are shortsighted, perhaps because they do not fully comprehend the implications of government budget deficits. It is possible that some people follow simple and not fully rational rules of thumb when choosing how much to save. Suppose, for example, that a person acts on the assumption that future taxes will be the same as current taxes. This person will fail to take account of future changes in taxes required by current government policies. A debt-financed tax cut will lead this person to believe that his lifetime income has increased, even if it hasn't. The tax cut will therefore lead to higher consumption and lower national saving.

Borrowing Constraints The Ricardian view of government debt assumes that consumers base their spending not on their current income but on their lifetime income, which includes both current and expected future income. According to the Ricardian view, a debt-financed tax cut increases current income, but it does not alter lifetime income or consumption. Advocates of the traditional view of government debt argue that current income is more important than lifetime income for those consumers who face binding borrowing constraints. A *borrowing constraint* is a limit on how much an individual can borrow from banks or other financial institutions.

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[2]For a survey of the debate over Ricardian equivalence, see Douglas Bernheim, "Ricardian Equivalence: An Evaluation of Theory and Evidence," *NBER Macroeconomics Annual* (1987): 263–303. See also the symposium on budget deficits in the Spring 1989 issue of the *Journal of Economic Perspectives*.

A person who would like to consume more than his current income allows—perhaps because he expects higher income in the future—has to do so by borrowing. If he cannot borrow to finance current consumption, or can borrow only a limited amount, his current income determines his spending, regardless of what his lifetime income might be. In this case, a debt-financed tax cut raises current income and thus consumption, even though future income will be lower. In essence, when the government cuts current taxes and raises future taxes, it is giving taxpayers a loan. For a person who wanted to obtain a loan but was unable to, the tax cut expands his opportunities and stimulates consumption.

CASE STUDY

George Bush's Withholding Experiment

In early 1992, President George H.W. Bush pursued a novel policy to deal with the lingering recession in the United States. By executive order, he lowered the amount of income taxes that were being withheld from workers' paychecks. The order did not reduce the amount of taxes that workers owed; it merely delayed payment. The higher take-home pay that workers received during 1992 was to be offset by higher tax payments, or smaller tax refunds, when income taxes were due in April 1993.

What effect would you predict for this policy? According to the logic of Ricardian equivalence, consumers should realize that their lifetime resources were unchanged and, therefore, save the extra take-home pay to meet the upcoming tax liability. Yet George Bush claimed his policy would provide "money people can use to help pay for clothing, college, or to get a new car." That is, he believed that consumers would spend the extra income, thereby stimulating aggregate demand and helping the economy recover from the recession. Bush seemed to be assuming that consumers were shortsighted or faced binding borrowing constraints.

Gauging the actual effects of this policy is difficult with aggregate data because many other things were happening at the same time. Yet some evidence comes from a survey two economists conducted shortly after the policy was announced. The survey asked people what they would do with the extra income. Fifty-seven percent of the respondents said they would save it, use it to repay debts, or adjust their withholding in order to reverse the effect of Bush's executive order. Forty-three percent said they would spend the extra income. Thus, for this policy change, a majority of the population was planning to act as Ricardian theory posits. Nonetheless, Bush was partly right: many people planned to spend the extra income, even though they understood that the following year's tax bill would be higher.[3] ■

[3]Matthew D. Shapiro and Joel Slemrod, "Consumer Response to the Timing of Income: Evidence From a Change in Tax Withholding," *American Economic Review* 85 (March 1995): 274–283.

Future Generations Besides myopia and borrowing constraints, a third argument for the traditional view of government debt is that consumers expect the implied future taxes to fall not on them but on future generations. Suppose, for example, that the government cuts taxes today, issues 30-year bonds to finance the budget deficit, and then raises taxes in 30 years to repay the loan. In this case, the government debt represents a transfer of wealth from the next generation of taxpayers (which faces the tax hike) to the current generation of taxpayers (which gets the tax cut). This transfer raises the lifetime resources of the current generation, so it raises their consumption. In essence, a debt-financed tax cut stimulates consumption because it gives the current generation the opportunity to consume at the expense of the next generation.

Drawing by Dave Carpenter. From the *Wall Street Journal*. Permission, Cartoon Features Syndicate.

"What's this I hear about you adults mortgaging my future?"

Economist Robert Barro has provided a clever rejoinder to this argument to support the Ricardian view. Barro argues that because future generations are the children and grandchildren of the current generation, we should not view these various generations as independent economic actors. Instead, he argues, the appropriate assumption is that current generations care about future generations. This altruism between generations is evidenced by the gifts that many people give their children, often in the form of bequests at the time of their deaths. The existence of bequests suggests that many people are not eager to take advantage of the opportunity to consume at their children's expense.

According to Barro's analysis, the relevant decisionmaking unit is not the individual, whose life is finite, but the family, which continues forever. In other words, an individual decides how much to consume based not only on his own income but also on the income of future members of his family. A debt-financed tax cut may raise the income an individual receives in his lifetime, but it does not raise his family's overall resources. Instead of consuming the extra income from the tax cut, the individual saves it and leaves it as a bequest to his children, who will bear the future tax liability.

We can see now that the debate over government debt is really a debate over consumer behavior. The Ricardian view assumes that consumers have a long time horizon. Barro's analysis of the family implies that the consumer's time horizon, like the government's, is effectively infinite. Yet it is possible that consumers do not look ahead to the tax liabilities of future generations. Perhaps they expect their children to be richer than they are and therefore welcome the opportunity to consume at their children's expense. The fact that many people leave zero or minimal bequests to their children is consistent with this hypothesis. For these zero-bequest families, a debt-financed tax cut alters consumption by redistributing wealth among generations.[4]

[4]Robert J. Barro, "Are Government Bonds Net Wealth?" *Journal of Political Economy* 81 (1974): 1095–1117.

CASE STUDY

Why Do Parents Leave Bequests?

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

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

To test this "strategic bequest motive," these economists examined data on how often children visit their parents. They found that the more wealthy the parent, the more often the children visit. Even more striking was another result: only wealth that can be left as a bequest induces more frequent visits. Wealth that cannot be bequeathed—such as pension wealth, which reverts to the pension company in the event of an early death—does not encourage children to visit. These findings suggest that there may be more to the relationships among generations than mere altruism.[5] ■

Making a Choice

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

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

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

We might hope that the evidence could help us decide between these two views of government debt. Yet when economists examine historical episodes of large budget deficits, the evidence is inconclusive. History can be interpreted in different ways.

Consider, for example, the experience of the 1980s. The large budget deficits, caused partly by the Reagan tax cut of 1981, seem to offer a natural experiment to test the two views of government debt. At first glance, this episode appears

[5]B. Douglas Bernheim, Andrei Shleifer, and Lawrence H. Summers, "The Strategic Bequest Motive," *Journal of Political Economy* 93 (1985): 1045–1076.

decisively to support the traditional view. The large budget deficits coincided with low national saving, high real interest rates, and a large trade deficit. Indeed, advocates of the traditional view of government debt often claim that the experience of the 1980s confirms their position.

Yet those who hold the Ricardian view of government debt interpret these events differently. Perhaps saving was low in the 1980s because people were optimistic about future economic growth—an optimism that was also reflected in a booming stock market. Or perhaps saving was low because people expected that the tax cut would eventually lead not to higher taxes but, as Reagan promised, to lower government spending. Because it is hard to rule out any of these interpretations, both views of government debt survive.

FYI

Ricardo on Ricardian Equivalence

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

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

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

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

> It would be difficult to convince a man possessed of 20,000 pounds, or any other sum, that a perpetual payment of 50 pounds per annum was equally burdensome with a single tax of 1000 pounds. He would have some vague notion that the 50 pounds per annum would be paid by posterity, and would not be paid by him; but if he leaves his fortune to his son, and leaves it charged with this perpetual tax, where is the difference whether he leaves him 20,000 pounds with the tax, or 19,000 pounds without it?

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

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

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

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

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

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

19-5 Other Perspectives on Government Debt

The policy debates over government debt have many facets. So far we have considered the traditional and Ricardian views of government debt. According to the traditional view, a government budget deficit expands aggregate demand and stimulates output in the short run but crowds out capital and depresses economic growth in the long run. According to the Ricardian view, a government budget deficit has none of these effects because consumers understand that a budget deficit represents merely the postponement of a tax burden. With these two theories as background, we now consider several other perspectives on government debt.

Balanced Budgets Versus Optimal Fiscal Policy

In the United States, many state constitutions require the state government to run a balanced budget. A recurring topic of political debate is whether the Constitution should require a balanced budget for the federal government as well. Most economists oppose a strict rule requiring the government to balance its budget. There are three reasons why optimal fiscal policy may at times call for a budget deficit or surplus.

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

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

Intergenerational Redistribution A budget deficit can be used to shift a tax burden from current to future generations. For example, some economists argue that if the current generation fights a war to preserve freedom, future generations

benefit as well and should bear some of the burden. To pass on some of the war's costs, the current generation can finance the war with a budget deficit. The government can later retire the debt by levying taxes on the next generation.

These considerations lead most economists to reject a strict balanced-budget rule. At the very least, a rule for fiscal policy needs to take account of the recurring episodes, such as recessions and wars, during which it is reasonable for the government to run a budget deficit.

Fiscal Effects on Monetary Policy

In 1985, Paul Volcker told Congress that "the actual and prospective size of the budget deficit . . . heightens skepticism about our ability to control the money supply and contain inflation." A decade later, Alan Greenspan claimed that "a substantial reduction in the long-term prospective deficit of the United States will significantly lower very long-term inflation expectations." Both of these Fed chairmen apparently saw a link between fiscal policy and monetary policy.

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

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

Despite these concerns about a possible link between government debt and monetary policy, there is little evidence that this link is important in most developed countries. In the United States, for instance, inflation was high in the 1970s, even though government debt was low relative to GDP. Monetary policymakers got inflation under control in the early 1980s, just as fiscal policymakers started running large budget deficits and increasing the government debt. Thus, although monetary policy might be driven by fiscal policy in some situations, such as during classic hyperinflations, this situation appears not to be the norm in most countries today. There are several reasons for this. First, most governments can finance deficits by selling debt and don't need to rely on seigniorage. Second, central banks often have enough independence to resist political pressure for more expansionary monetary policy. Third, and most important, policymakers in all parts of government know that inflation is a poor solution to fiscal problems.

Debt and the Political Process

Fiscal policy is made not by angels but by an imperfect political process. Some economists worry that the possibility of financing government spending by issuing debt makes that political process all the worse.

This idea has a long history. Nineteenth-century economist Knut Wicksell claimed that if the benefit of some type of government spending exceeded its cost, it should be possible to finance that spending in a way that would receive unanimous support from the voters. He concluded that government spending should be undertaken only when support is, in fact, nearly unanimous. In the case of debt finance, however, Wicksell was concerned that "the interests [of future taxpayers] are not represented at all or are represented inadequately in the tax-approving assembly."

Many economists have echoed this theme more recently. In their 1977 book *Democracy in Deficit*, James Buchanan and Richard Wagner argued for a balanced-budget rule for fiscal policy on the grounds that it "will have the effect of bringing the real costs of public outlays to the awareness of decision makers; it will tend to dispel the illusory 'something for nothing' aspects of fiscal choice." Similarly, Martin Feldstein (once an economic adviser to Ronald Reagan and a long-time critic of budget deficits) argued that "only the 'hard budget constraint' of having to balance the budget" can force politicians to judge whether spending's "benefits really justify its costs."

These arguments have led some economists to favor a constitutional amendment requiring Congress to pass a balanced budget. Often these proposals have escape clauses for times of national emergency, such as wars and depressions, when a budget deficit is a reasonable policy response. Some critics of these proposals argue that, even with the escape clauses, such a constitutional amendment would tie the hands of policymakers too severely. Others claim that Congress would easily evade the balanced-budget requirement with accounting tricks. As this discussion makes clear, the debate over the desirability of a balanced-budget amendment is as much political as economic.

International Dimensions

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

First, high levels of government debt may increase the risk that an economy will experience capital flight—an abrupt decline in the demand for a country's assets in world financial markets. International investors are aware that a government can always deal with its debt simply by defaulting. This approach was used as far back as 1335, when England's King Edward III defaulted on his debt to Italian bankers. More recently, several Latin American countries defaulted on

their debts in the 1980s, and Russia did the same in 1998. In 2011, it seemed likely that Greece was heading toward that outcome as well (a topic we discuss in the next chapter). The higher the level of the government debt, the greater the temptation of default. Thus, as government debt increases, international investors may come to fear default and curtail their lending. If this loss of confidence occurs suddenly, the result could be the classic symptoms of capital flight: a collapse in the value of the currency and an increase in interest rates. As we discussed in Chapter 13, this is precisely what happened to Mexico in the early 1990s when default appeared likely.

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

CASE STUDY

The Benefits of Indexed Bonds

In 1997, the U.S. Treasury Department started to issue bonds that pay a return based on the consumer price index. These bonds typically pay a low interest rate of about 2 percent, so a $1,000 bond pays only $20 per year in interest. But that interest payment grows with the overall price level as measured by the CPI. In addition, when the $1,000 of principal is repaid, that amount is also adjusted for changes in the CPI. The 2 percent, therefore, is a real interest rate. Professors of macroeconomics no longer need to define the real interest rate as an abstract construct. They can open the *New York Times*, point to the credit report, and say, "Look here, this is a nominal interest rate, and this is a real interest rate." (Professors in the United Kingdom and several other countries have long enjoyed this luxury because indexed bonds have been trading in other countries for years.)

Of course, making macroeconomics easier to teach was not the reason that the Treasury chose to index some of the government debt. That was just a positive externality. Its goal was to introduce a new type of government bond that would benefit bondholder and taxpayer alike. These bonds are a win–win proposition because they insulate both sides of the transaction from inflation risk. Bondholders should care about the real interest rate they earn, and taxpayers should care about

the real interest rate they pay. When government bonds are specified in nominal terms, both sides take on risk that is neither productive nor necessary. The indexed bonds eliminate this inflation risk.

In addition, the indexed bonds have three other benefits.

First, the bonds may encourage the private sector to begin issuing its own indexed securities. Financial innovation is, to some extent, a public good. Once an innovation has been introduced into the market, the idea is nonexcludable (people cannot be prevented from using it) and nonrival (one person's use of the idea does not diminish other people's use of it). Just as a free market will not adequately supply the public goods of national defense and basic research, it will not adequately supply financial innovation. The Treasury's indexed bonds can be viewed as a remedy for that market failure.

Second, the bonds reduce the government's incentive to produce surprise inflation. After the budget deficits of the past few decades, the U.S. government is now a substantial debtor, and its debts are specified almost entirely in dollar terms. What is unique about the federal government, in contrast to most debtors, is that it can print the money it needs. The greater the government's nominal debts, the more incentive the government has to inflate away its debt. The Treasury's switch toward indexed debt reduces this potentially problematic incentive.

Third, the bonds provide data that might be useful for monetary policy. Many macroeconomic theories point to expected inflation as a key variable to explain the relationship between inflation and unemployment. But what is expected inflation? One way to measure it is to survey private forecasters. Another way is to look at the difference between the yield on nominal bonds and the yield on real bonds.

The Treasury's indexed bonds, therefore, produced many benefits: less inflation risk, more financial innovation, better government incentives, more informed monetary policy, and easier lives for students and teachers of macroeconomics.[6] ■

19-6 Conclusion

Fiscal policy and government debt are central in the political and economic debate worldwide. This chapter discussed some of the economic issues that lie behind the policy decisions. As we have seen, economists are not in complete agreement about the measurement or effects of government indebtedness. Nor are economists in agreement about the best budget policy. And, of course, economists are not in charge of designing and enacting budget policies. For better or worse, that role goes to our elected leaders, who follow the recommendations of their economic advisers only when they choose to.

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

Summary

1. The current debt of the U.S. federal government is of moderate size compared to the debt of other countries or compared to the debt that the United States has had throughout its own history. The 1980s and early 1990s were unusual in that the ratio of debt to GDP increased during a period of peace and prosperity. From 1995 to 2001, the ratio of debt to GDP declined significantly, but after 2001 it started to rise again. It then rose precipitously in the aftermath of the financial crisis of 2008–2009.
2. Standard measures of the budget deficit are imperfect measures of fiscal policy because they do not correct for the effects of inflation, do not offset changes in government liabilities with changes in government assets, omit some liabilities altogether, and do not correct for the effects of the business cycle.
3. According to the traditional view of government debt, a debt-financed tax cut stimulates consumer spending and lowers national saving. This increase in consumer spending leads to greater aggregate demand and higher income in the short run, but it leads to a lower capital stock and lower income in the long run.
4. According to the Ricardian view of government debt, a debt-financed tax cut does not stimulate consumer spending because it does not raise consumers' overall resources—it merely reschedules taxes from the present to the future. The debate between the traditional and Ricardian views of government debt is ultimately a debate over how consumers behave. Are consumers rational or shortsighted? Do they face binding borrowing constraints? Are they economically linked to future generations through altruistic bequests? Economists' views of government debt hinge on their answers to these questions.
5. Most economists oppose a strict rule requiring a balanced budget. A budget deficit can sometimes be justified on the basis of short-run stabilization, tax smoothing, or intergenerational redistribution of the tax burden.
6. Government debt can potentially have other effects. Large government debt or budget deficits may encourage excessive monetary expansion and, therefore, lead to greater inflation. The possibility of running budget deficits may encourage politicians to unduly burden future generations when setting government spending and taxes. A high level of government debt may increase the risk of capital flight and diminish a nation's influence around the world. Economists differ in which of these effects they consider most important.

KEY CONCEPTS

Capital budgeting

Cyclically adjusted budget deficit

Ricardian equivalence

QUESTIONS FOR REVIEW

1. What was unusual about U.S. fiscal policy from 1980 to 1995?
2. Why do many economists project increasing budget deficits and government debt over the next several decades?
3. Describe four problems affecting measurement of the government budget deficit.
4. According to the traditional view of government debt, how does a debt-financed tax cut affect public saving, private saving, and national saving?
5. According to the Ricardian view of government debt, how does a debt-financed tax cut affect public saving, private saving, and national saving?
6. Do you find the traditional or the Ricardian view of government debt more credible? Why?
7. Give three reasons why a budget deficit might be a good policy choice.
8. Why might the level of government debt affect the government's incentives regarding money creation?

PROBLEMS AND APPLICATIONS

1. On April 1, 1996, Taco Bell, the fast-food chain, ran a full-page ad in the *New York Times* with this news: "In an effort to help the national debt, Taco Bell is pleased to announce that we have agreed to purchase the Liberty Bell, one of our country's most historic treasures. It will now be called the *Taco Liberty Bell* and will still be accessible to the American public for viewing. We hope our move will prompt other corporations to take similar action to do their part to reduce the country's debt." Would such actions by U.S. corporations actually reduce the national debt as it is now measured? How would your answer change if the U.S. government adopted capital budgeting? Do you think these actions represent a true reduction in the government's indebtedness? Do you think Taco Bell was serious about this plan? (*Hint:* Note the date.) Be sure to explain your answers.
2. Draft a letter to the senator described in Section 19-3, explaining the logic of the Ricardian view of government debt and evaluating its practical relevance.
3. The Social Security system levies a tax on workers and pays benefits to the elderly. Suppose that Congress increases both the tax and the benefits. For simplicity, assume that Congress announces that the increases will last for only one year.
   a. How do you suppose this change would affect the economy? (*Hint:* Think about the marginal propensities to consume of the young and the old.)
   b. Does your answer depend on whether generations are altruistically linked?
4. Some economists have proposed the rule that the cyclically adjusted budget deficit always be balanced. Compare this proposal to a strict balanced-budget rule. Which is preferable? What problems do you see with the rule requiring a balanced cyclically adjusted budget?
5. Find some recent projections for the future path of the U.S. government debt as a percentage of GDP. What assumptions are made about government spending, taxes, and economic growth? Do you think these assumptions are reasonable? If the United States experiences a productivity slowdown, how will reality differ from this projection? (*Hint:* A good place to look is www.cbo.gov.)

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The Financial System: Opportunities and Dangers

When written in Chinese the word crisis *is composed of two characters. One represents danger, and the other represents opportunity.*

—John F. Kennedy

In 2008 and 2009, the U.S. economy experienced a historic crisis. As we discussed in previous chapters, a decline in housing prices led to problems in many financial institutions, which in turn led to the most severe economic downturn since the Great Depression of the 1930s. This event was a vivid reminder of the inexorable links between the financial system and the broader economy. When Wall Street sneezes, Main Street catches a cold.

In this chapter we examine the links between the economy and the financial system more thoroughly. We discuss what the financial system is and how it works. We also discuss the new challenges that the financial system offers to policymakers charged with promoting short-run economic stability and long-run economic growth.

The financial system has been present in much of the macroeconomic theory we have developed throughout this book. In Chapter 3 we discussed a model of the loanable-funds market. There we saw that the interest rate adjusts to balance the supply of loanable funds (derived from the nation's saving) and the demand for loanable funds (for purpose of investment). In Chapters 8 and 9 we used the Solow model to examine the sources of economic growth. In that model, the financial system is in the background, ensuring that the economy's saving is directed into investment and capital accumulation.

The financial system has been similarly present in our short-run analysis. In the *IS–LM* model of Chapters 11 and 12, the interest rate is the link between the goods market and the money market. In that model, the interest rate determines both the cost of holding money and the cost of borrowing to fund investment spending. It is therefore the crucial variable through which monetary policy influences the aggregate demand for goods and services.

By studying the financial system in more detail, we can make our analysis of economic growth and fluctuations more nuanced. The financial system is more than a single market for loanable funds, and there are more prices in this system than a single interest rate. Indeed, the complexity of the financial system is

sufficiently great that there is an entire subfield of economics, called *finance*, devoted to its study. This chapter focuses on a couple of topics within finance that are crucial to a fuller understanding of macroeconomics. In particular, we start by examining the fundamental role of the financial system in the economy. We then examine the causes of financial crises and the policy responses to them.

20-1 What Does the Financial System Do?

Larry is a rational, forward-looking consumer. He earns a good income of $200,000 a year but does not plan to spend all of it this year. He wants to put some of his income aside, perhaps for retirement, a future vacation, college tuition for his newborn son, or just as a precaution to prepare for future uncertainties. The part of Larry's income that he does not currently spend contributes to the nation's saving.

Patti is an entrepreneur starting a new business. She has an idea for a doll that she believes would enchant young girls around the world and therefore be quite profitable. To put her idea into action, she needs to obtain some resources: plastics, molds, fabric, sewing machines, and a building to house her small manufacturing operation. Patti's purchases of these capital goods contribute to the nation's investment.

In short, Larry has some income he wants to save, and Patti has ideas for investments but may not have the funds to pay for them. The solution is obvious: Larry can finance Patti's venture. The **financial system** is the broad term for the institutions in the economy that facilitate the flow of funds between savers and investors. That is, the financial system brings people like Larry and people like Patti together.[1]

Financing Investment

Throughout much of this book, the economy's financial system was represented as a single market—the market for loanable funds. Those like Larry, who have some income they don't want to immediately consume, bring their saving to this market so they can lend these funds to others. Those like Patti, who have investment projects they want to undertake, finance these investments by borrowing in this market. In this simple model, there is a single interest rate that adjusts to bring saving and investment into balance.

The actual financial system is more complicated than this description. As in the simple model, the goal of the system is to channel resources from savers into various forms of investment. But the system includes a large variety of mechanisms to facilitate this transfer of resources.

One piece of the financial system is the set of **financial markets** through which households can directly provide resources for investment. Two important

[1] *Trivia fact*: This story not entirely fictional. The author really does know a Patti who started a doll business and a Larry who financed it.

financial markets are the market for **bonds** and the market for **stocks**. A bond represents a loan from the bondholder to the firm; a share of stock represents an ownership claim by the shareholder in the firm. That is, a person who buys a bond from, say, Apple Corporation becomes a creditor of the company, while a person who buys newly issued stock from Apple becomes a part owner of the company. (A purchase of stock on a stock exchange, however, represents a transfer of ownership shares from one person to another and does not provide new funds for investment projects.) Raising investment funds by issuing bonds is called **debt finance**, and raising funds by issuing stock is called **equity finance**.

Another piece of the financial system is the set of **financial intermediaries** through which households can indirectly provide resources for investment. As the term suggests, a financial intermediary stands between the two sides of the market and helps direct financial resources toward their best use. Banks are the best-known type of financial intermediary. They take deposits from savers and use these deposits to make loans to those who have investment projects they need to finance. Other examples of financial intermediaries include mutual funds, pension funds, and insurance companies. In contrast to buying a stock or bond on a financial market, the saver is often unaware of the investments that his saving is financing when a financial intermediary is involved.

To continue with our example, Larry and Patti can take advantage of any of these opportunities. If Patti and Larry know each other, she could borrow money directly from him and pay him interest on the loan. In this case, she would in effect be selling him a bond. Or Patti could, in exchange for Larry's money, give him an ownership stake in her new business, and he would enjoy a share of the future profits. In this case, she would be selling him some stock. Or Larry could deposit his saving in a local bank, which in turn could lend the funds to Patti. In this last case, he would be financing her new venture indirectly: They might never meet, nor even know of each other's existence. In all of these cases, Larry and Patti engage in a mutually advantageous exchange. Larry finds a way to earn a return on his saving, and Patti finds a way to finance her investment project.

Sharing Risk

Investment is inherently risky. Patti's new doll might be the next toy craze (remember Beanie Babies?), or it might be a flop. Like all entrepreneurs, Patti is starting her venture because she expects it to be profitable, but she cannot be certain of that outcome.

One function of the financial system is to allocate risk. When Patti sells stock to Larry, she is sharing the risk of her venture with him. If her doll business is profitable, he will enjoy some of the gains. If it loses money, he will share in the losses. Patti might be eager to share the risk, rather than bear it all herself, because she is **risk averse**. That is, other things equal, she dislikes randomness in her economic circumstances. Larry might be willing to accept some of the risk if the return he expects on this risky venture is higher than he would obtain by putting his saving into safer assets. Thus, equity finance provides a way for entrepreneurs and savers to share the risks and returns associated with the entrepreneur's investment ideas.

In addition, the financial system allows savers to reduce their risk by spreading their wealth across many different businesses. Larry knows that buying stock in Patti's doll venture is risky, so he would be smart to use only some of his saving to buy stock in her business. He could also buy stock from his friend Steve, who is opening an ice-cream store. And he could buy stock in established companies, such as IBM, General Electric, and Exxon. Because the success of Patti's doll venture is not perfectly correlated with the success of Steve's ice-cream store, or with the profitability of IBM, General Electric, and Exxon, Larry reduces the overall risk he faces when he spreads his wealth around. Reducing risk by holding many imperfectly correlated assets is called **diversification**.

Various financial institutions facilitate diversification. Among the most important are mutual funds. **Mutual funds** are financial intermediaries that sell shares to savers and use their funds to buy diversified pools of assets. Even a small saver can put, say, $1,000 into a mutual fund and become a part owner of thousands of businesses. Because the fortunes of these many businesses do not rise and fall together, putting the $1,000 into a mutual fund is far less risky than using it to buy stock in a single company.

There are limits, however, to how much diversification reduces risk. Some macroeconomic events affect many businesses at the same time. Such risk is called *systematic risk*. In particular, recessions tend to reduce the demand for most products and thus the profitability of most businesses. Diversification cannot reduce this kind of risk. Yet it can largely eliminate the risks associated with individual businesses, called *idiosyncratic risk*, such as whether Patti's doll or Steve's ice cream proves popular. For this reason, it is wise for savers like Larry to limit how much of their savings they allocate to the stock of any one company.

Dealing With Asymmetric Information

As Larry considers financing Patti's business venture, one question is paramount in his mind: will her company succeed? If Larry offers her equity financing, the fortune of the business will be crucial because he is being promised a share of future profits. But even if Larry offers her debt financing, Patti's success is still relevant. If the doll business is a failure, Patti may not be able to repay the loan. That is, she might default. Not only might Larry not get the interest he was promised, but he might lose his principal (the amount of the loan) as well.

Making matters worse is the fact that Patti knows a lot more than Larry about herself and her business. Economists use the phrase **asymmetric information** to describe a situation in which one party to an economic transaction has more information about the transaction than the other. There are two classic types of asymmetric information, both of which are relevant as Larry ponders whether to finance Patti's venture.

The first type of asymmetric information concerns *hidden knowledge about attributes*. Is Patti's doll design a good one that will have wide appeal? Is the doll market ready for a new product, or is it oversaturated? Is Patti a talented businesswoman? Patti is more likely than Larry to have reliable answers to these questions. This is generally the case: entrepreneurs have more information about whether their investment projects are good ones than those who provide the financing.

In this situation, Larry should worry about the problem of **adverse selection**. As we noted in Chapter 7 in a different context, the term "adverse selection" describes the tendency of people with more information (here, the entrepreneurs) to sort themselves in a way that disadvantages people with less information (here, those providing the financing). In our example, Larry may be concerned that he will be offered opportunities to finance only less desirable business ventures. If Patti was truly confident in her idea, she might try harder to finance it herself, using more of her own savings. The fact that she is asking Larry to provide financing and share some of the risk suggests that perhaps she knows something adverse that he does not know. As a result, Larry has reason to be wary.

The second type of asymmetric information concerns *hidden knowledge about actions.* Once Patti obtains financing from Larry, she will have many decisions to make. Will she work long hours at the job, or will she cut out early to play tennis with friends? Will she spend the money she has raised in the most profitable way, or will she use it to provide herself with a cushy office and a fancy company car? Patti can promise to make decisions in the best interests of the business, but it will be hard for Larry to verify that she in fact does so because he won't be at the doll factory every day to observe all the decisions that she makes.

In this case, the problem that arises is **moral hazard**, the risk that an imperfectly monitored agent will act in a dishonest or otherwise inappropriate way. In particular, entrepreneurs investing other people's money may not look after the investment projects as carefully as those investing their own. Once Patti has Larry's money in hand, she may be tempted to choose the easy life. If she succumbs to moral hazard, she will reduce the future profitability of the firm and increase the risk of default on her firm's debts.

The financial system has developed various institutions that mitigate the effects of adverse selection and moral hazard. Banks are among the most important. When a person applies for a bank loan, the application is scrutinized by loan officers who are trained to evaluate businesses and their prospects. Thus, the loan officers stand a good chance of uncovering the hidden attributes that lead to adverse selection. To reduce the problem of moral hazard, bank loans may contain restrictions on how the loan proceeds are spent, and the loan officers may monitor the business after the loan is made. As a result, rather than making a direct loan to Patti, it may make sense for Larry to deposit his money in a bank, which in turn will lend it to various entrepreneurs like Patti. The bank would charge a fee for serving as an intermediary, reflected in the spread between the interest rate it charges on loans and the interest rate it pays on deposits. But the bank earns its fee by reducing the problems associated with asymmetric information.

Fostering Economic Growth

In Chapters 8 and 9 we used the Solow model to examine the forces that govern long-run economic growth. In that model, we saw that a nation's saving determines the steady-state level of capital, which in turn determines the steady-state level of income per person. The more a nation saves, the more capital its labor force has to work with, the more it produces, and the more income its citizens enjoy.

The Solow model makes the simplifying assumption that there is only a single type of capital, but the real world includes many thousands of firms with diverse investment projects competing for the economy's limited resources. Larry's saving can finance Patti's doll business, but it could instead finance Steve's ice-cream store, a Boeing aircraft factory, or a Walmart retail outlet. The financial system has the job of allocating the economy's scarce saving among the alternative types of investment.

Ideally, to allocate saving to investment, all the financial system needs are market forces and the magic of Adam Smith's invisible hand. Firms with particularly productive and profitable investment opportunities will be willing to pay higher interest rates for loans than those with less desirable projects. Thus, if the interest rate adjusts to balance the supply and demand for loanable funds, the economy's saving will be allocated to the best of the many possible investments.

Yet, as we have seen, because the financial system is full of problems arising from asymmetric information, it can deviate from this simple classical ideal. Banks mitigate adverse selection and moral hazard to some extent, but they do not completely eliminate them. As a result, some good investment projects may not materialize because entrepreneurs cannot raise the funds to finance them. If the financial system fails to allocate the economy's saving to its best uses, the economy's overall level of productivity will be lower than it could be.

Government policy plays a role in helping ensure that the financial system works well. First, it can reduce the problem of moral hazard by prosecuting fraud and similar malfeasance. The law cannot ensure that Patti will put Larry's money to its best use, but if she uses it to pay her personal living expenses, she may well end up in jail. Second, the government can reduce the problem of adverse selection by requiring some kinds of disclosure. If Patti's doll business ever grows large enough to issue stock on a public stock exchange, the government's Securities and Exchange Commission will require that she release regular reports on her firm's earnings and assets and that these reports be certified by accredited accountants.

Because the quality of legal institutions varies around the world, some countries have better financial systems than others, and this difference is one source of international variation in living standards. Rich nations tend to have larger stock markets and larger banking systems (relative to the size of their economies) than poorer nations. As always, sorting out cause and effect is difficult when examining differences across countries. Nonetheless, many economists believe that one reason poor nations remain poor is that their financial systems are unable to direct their saving to the best possible investments. These nations can foster economic growth by reforming their legal institutions with an eye toward improving the performance of their financial systems. If they succeed, entrepreneurs with good ideas will find it easier to start their businesses.

CASE STUDY

Microfinance: Professor Yunus's Profound Idea

In the 1970s, Muhammad Yunus was a professor of economics in Bangladesh. Like all economists, he knew that economic prosperity depends on the ability of entrepreneurs to get the financing they need to start their businesses. But

he also knew that in his country and in similar developing nations, financing is often hard to find. In the United States, someone like Patti might well find a bank willing to make her a loan, especially if she had some of her own money to put into her business. But if she were living in a country with a less developed financial system, such as Bangladesh, and especially if she were poor, she would have a harder time financing her venture, no matter how profitable it might be.

Professor Yunus was not content just to study the problem; he wanted to solve it. In 1976, he founded the Grameen Bank, a nonprofit financial institution with the goal of making very small loans primarily to poor women so that they could start working their way out of poverty. In Bangla, the language of Bangladesh, Grameen Bank means "bank of the villages."

Here is how the Grameen Bank explains its mission:

> Microfinance is a proven tool for fighting poverty on a large scale. It provides very small loans, or micro-loans, to poor people, mostly women, to start or expand very small, self-sufficient businesses. Through their own ingenuity and drive, and the support of the lending microfinance institution (MFI), poor women are able to start their journey out of poverty.
>
> Unlike commercial loans, no collateral is required for a micro-loan and it is usually repaid within six months to a year. Those funds are then recycled as other loans, keeping money working and in the hands of borrowers. For example, a woman could borrow $50 to buy chickens so that she can sell their eggs. As the chickens reproduce, she can sell more eggs and eventually sell the chicks. As a borrower, she receives advice and support from the MFI that issued her loan, and support from other borrowers just like her. Some MFIs also provide social services, such as basic health care for her and her children. As her business grows and diversifies, she begins to earn enough to improve the living conditions for her and her family. Microfinance clients boast very high repayment rates. Averaging between 95 and 98 percent, the repayment rates are better than that of student loan and credit card debts in the United States.

Professor Yunus's plan has been remarkably successful, and it has been replicated in many other places. In 2006, he and the Grameen Bank won the Nobel Peace Prize for helping foster economic development in some of the world's poorest nations. Muhammad Yunus is the first economist to win a Nobel Prize in a field other than economics.[2] ■

20-2 Financial Crises

So far in this chapter we have discussed how the financial system works. We now discuss why the financial system might stop working and the broad macroeconomic ramifications of such a disruption.

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[2]The source of the quotation is http://www.grameenfoundation.org/what-we-do/microfinance-basics. For more on this topic, see Beatriz Armendáriz and Jonathan Morduch, *The Economics of Microfinance* (Cambridge, Mass. MIT Press, 2007).

When we discussed the theory of the business cycle in Chapters 10 to 14, we saw that many kinds of shocks can lead to short-run fluctuations. A shift in consumer or business confidence, a rise or fall in world oil prices, or a sudden change in monetary or fiscal policy can alter aggregate demand or aggregate supply (or both). When this occurs, output and employment are pushed away from their natural levels, and inflation rises or falls as well.

Here we focus on one particular kind of shock. A **financial crisis** is a major disruption in the financial system that impedes the economy's ability to intermediate between those who want to save and those who want to borrow and invest. Not surprisingly, given the financial system's central role, financial crises have a broad macroeconomic impact. Throughout history, many of the deepest recessions have followed problems in the financial system. These downturns include the Great Depression of the 1930s and the great recession of 2008–2009.

The Anatomy of a Crisis

Financial crises are not all alike, but they share some common features. In a nutshell, here are the six elements that are at the center of most financial crises. The financial crisis of 2008–2009 provides a good example of each element.

1. Asset-Price Booms and Busts Often, a period of optimism, leading to a large increase in asset prices, precedes a financial crisis. Sometimes people bid up the price of an asset above its fundamental value (that is, the true value based on an objective analysis of the cash flows the asset will generate). In this case, the market for that asset is said to be in the grip of a **speculative bubble**. Later, when sentiment shifts and optimism turns to pessimism, the bubble bursts and prices begin to fall. The decline in asset prices is the catalyst for the financial crisis.

In 2008 and 2009, the crucial asset was residential real estate. The average price of housing in the United States had experienced a boom earlier in the decade. This boom was driven in part by lax lending standards; many *subprime* borrowers—those with particularly risky credit profiles—were lent money to buy a house while offering only a very small down payment. In essence, the financial system failed to do its job of dealing with asymmetric information by making loans to many borrowers who, it turned out, would later have trouble making their mortgage payments. The housing boom was also encouraged by government policies that promoted homeownership and was fed by excessive optimism on the part of home-buyers, who thought prices would rise forever. The housing boom, however, proved unsustainable. Over time, the number of homeowners falling behind on their mortgage payments rose, and sentiment among home-buyers shifted. Housing prices fell by about 30 percent from 2006 to 2009. The nation had not experienced such a large decline in housing prices since the 1930s.

2. Insolvencies at Financial Institutions A large decline in asset prices may cause problems at banks and other financial institutions. To ensure that borrowers repay their loans, banks often require them to post collateral. That is, a borrower has to pledge assets that the bank can seize if the borrower defaults. Yet when assets

decline in price, the collateral falls in value, perhaps below the amount of the loan. In this case, if the borrower defaults on the loan, the bank may be unable to recover its money.

As we discussed in Chapter 4, banks rely heavily on **leverage**, the use of borrowed funds for the purposes of investment. Leverage amplifies the positive and negative effect of asset returns on a bank's financial position. A key number is the *leverage ratio*: the ratio of bank assets to bank capital. A leverage ratio of 20, for example, means that for every $1 in capital put into the bank by its owners, the bank has borrowed (via deposits and other loans) $19, which then allows the bank to hold $20 in assets. In this case, if defaults cause the value of the bank's assets to fall by 2 percent, then the bank's capital will fall by 40 percent. If the value of bank assets falls by more than 5 percent, then its assets will fall below its liabilities, and the bank will be insolvent. In this case, the bank will not have the resources to pay off all its depositors and other creditors. Widespread insolvency within the financial system is the second element of a financial crisis.

In 2008 and 2009, many banks and other financial firms had in effect placed bets on real estate prices by holding mortgages backed by that real estate. They assumed that housing prices would keep rising or at least hold steady, so the collateral backing these loans would ensure their repayment. When housing prices fell, however, large numbers of homeowners found themselves *underwater*: the value of their homes was less than the amount they owed on their mortgages. When many homeowners stopped paying their mortgages, the banks could foreclose on the houses, but they could recover only a fraction of what they were owed. These defaults pushed several financial institutions toward bankruptcy. These institutions included major investment banks (Bear Stearns and Lehman Brothers), government-sponsored enterprises involved in the mortgage market (Fannie Mae and Freddie Mac), and a large insurance company (AIG).

3. Falling Confidence The third element of a financial crisis is a decline in confidence in financial institutions. While some deposits in banks are insured by government policies, not all are. As insolvencies mount, every financial institution becomes a possible candidate for the next bankruptcy. Individuals with uninsured deposits in those institutions pull out their money. Facing a rash of withdrawals, banks cut back on new lending and start selling off assets to increase their cash reserves.

As banks sell off some of their assets, they depress the market prices of these assets. Because buyers of risky assets are hard to find in the midst of a crisis, the assets' prices can sometimes fall precipitously. Such a phenomenon is called a **fire sale**, similar to the reduced prices that a store might charge to get rid of merchandise quickly after a fire. These fire-sale prices, however, cause problems at other banks. Accountants and regulators may require these banks to revise their balance sheets and reduce the reported value of their own holdings of these assets. In this way, problems in one bank can spread to others.

In 2008 and 2009, the financial system was seized by great uncertainty about where the insolvencies would stop. The collapse of the giants Bear Stearns and Lehman Brothers made people wonder whether other large financial firms, such as Morgan Stanley, Goldman Sachs, and Citigroup, would meet a similar fate. The

F Y I

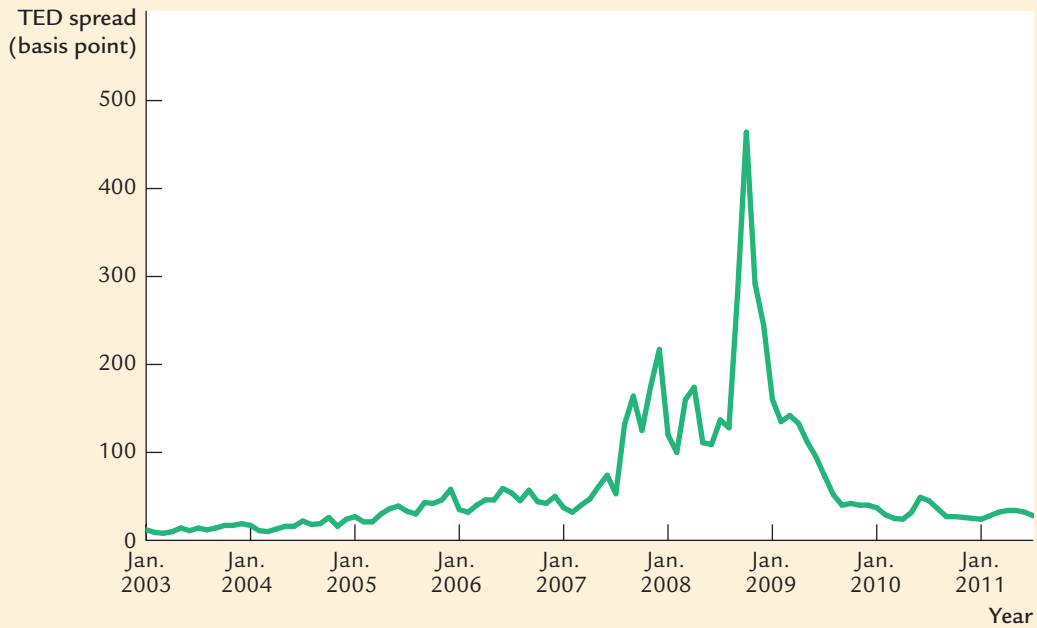
The TED Spread

A common type of indicator of perceived credit risk is the spread between two interest rates of similar maturity. For example, Financial Shaky Corporation might have to pay 7 percent for a one-year loan, whereas Safe and Solid Corporation has to pay only 3 percent. That spread of 4 percentage point occurs because lenders are worried that Financial Shaky might default; as a result, they demand compensation for bearing that risk. If Financial Shaky gets some bad news about its financial position, the interest rate spread might rise to 5 or 6 percentage points or even higher. Thus, one way to monitor perceptions of credit risk is to follow interest rate spreads.

One particularly noteworthy interest rate spread is the so-called TED spread (and not just because it rhymes). The TED spread is the difference between three-month interbank loans and three-month Treasury bills. The T in TED stands for T-bills, and ED stands for EuroDollars (because, for regulatory reasons, these interbank loans typically take place in London). The TED spread is measured in basis points, where a basis point is 1 one-hundredth of a percentage point (0.01 percent). Normally, the TED spread is about 10 to 50 basis points (0.1 to 0.5 percent). The spread is small because commercial banks, while a bit riskier than the government, are still very safe. Lenders do not require much extra compensation to accept the debt of banks rather than the government.

In times of financial crisis, however, confidence in the banking system falls. As a result, banks become reluctant to lend to one another, so the TED spread rises substantially. Figure 20-1 shows the TED spread before, during, and after the financial crisis of 2008–2009. As the crisis unfolded, the TED spread rose substantially, reaching 464 basis points in October 2008, just after the investment bank Lehman Brothers declared bankruptcy. The high level of the TED spread is a direct indicator of how worried people were about the solvency of the banking system.

FIGURE 20-1



The TED Spread The TED spread is the difference between the interest rate on three-month interbank loans and the interest rate on three-month Treasury bills. It rises when lending to banks is considered particularly risky.

Source: Federal Reserve Bank of St. Louis.

problem was exacerbated by the firms' interdependence. Because they had many contracts with one another, the demise of any one of these institutions would undermine all the others. Moreover, because of the complexity of the arrangements, depositors could not be sure how vulnerable these firms were. The lack of transparency fed the crisis of confidence.

4. Credit Crunch The fourth element of a financial crisis is a credit crunch. With many financial institutions facing difficulties, would-be borrowers have trouble getting loans, even if they have profitable investment projects. In essence, the financial system has trouble performing its normal function of directing the resources of savers into the hands of borrowers with the best investment opportunities.

The tightening of credit was clear during the 2008–2009 financial crisis. Not surprisingly, as banks realized that housing prices were falling and that previous lending standards had been too lax, they started raising standards for those applying for mortgages. They required larger down payments and scrutinized borrowers' financial information more closely. But the reduction in lending did not just affect home-buyers. Small businesses found it harder to borrow to finance business expansions or to buy inventories. Consumers found it harder to qualify for a credit card or car loan. Thus, banks responded to their own financial problems by becoming more cautious in all kinds of lending.

5. Recession The fifth element of a financial crisis is an economic downturn. With people unable to obtain consumer credit and firms unable to obtain financing for new investment projects, the overall demand for goods and services declines. Within the context of the *IS–LM* model, this event can be interpreted as a contractionary shift in the consumption and investment functions, which in turn leads to similar shifts in the *IS* curve and the aggregate demand curve. As a result, national income falls and unemployment rises.

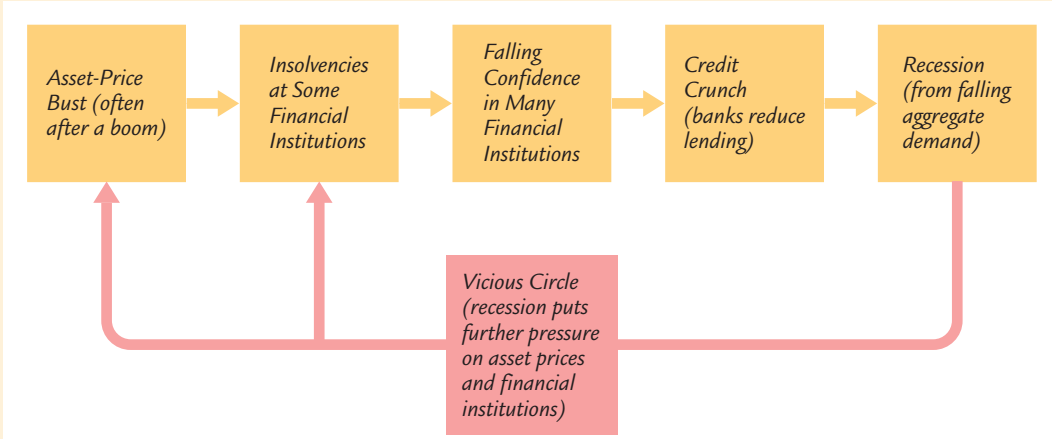
Indeed, the recession following the financial crisis of 2008–2009 was a deep one. Unemployment rose above 10 percent. Worse yet, it lingered at a high level for a long time. Even after the recovery began, growth in GDP was so meager that unemployment declined only slightly. As this book was going to press in early 2012, the unemployment rate was still above 8 percent.

6. A Vicious Circle The sixth and final element of a financial crisis is a vicious circle. The economic downturn reduces the profitability of many companies and the value of many assets. The stock market declines. Some firms go bankrupt and default on their business loans. Many workers become unemployed and default on their personal loans. Thus, we return to steps 1 (asset-price busts) and 2 (financial institution insolvencies). The problems in the financial system and the economic downturn reinforce each other. Figure 20-2 illustrates the process.

In 2008 and 2009, the vicious circle was apparent. Some feared that the combination of a weakening financial system and a weakening economy would cause the economy to spiral out of control, pushing the country into another Great Depression. Fortunately, that did not occur, in part because policymakers were intent on preventing it.

That brings us to the next question: faced with a financial crisis, what can policymakers do?

FIGURE 20-2



The Anatomy of a Financial Crisis This figure is a schematic illustration of the six elements of a financial crisis.

CASE STUDY

Who Should Be Blamed for the Financial Crisis of 2008–2009?

"Victory has a thousand fathers, but defeat is an orphan." This famous quotation from John F. Kennedy contains a perennial truth. Everyone is eager take credit for success, but no one wants to accept blame for failure. In the aftermath of the financial crisis of 2008–2009, many people wondered who was to blame. Not surprisingly, no one stepped forward to accept responsibility.

Nonetheless, economic observers have pointed their fingers at many possible culprits. The accused include the following:

- *The Federal Reserve.* The nation's central bank kept interest rates low in the aftermath of the 2001 recession. This policy helped promote the recovery, but it also encouraged households to borrow and buy housing. Some economists believe by keeping interest rates too low for too long, the Fed contributed to the housing bubble that eventually led to the financial crisis.
- *Home-buyers.* Many people were reckless in borrowing more than they could afford to repay. Others bought houses as a gamble, hoping that housing prices would keep rising at a torrid pace. When housing prices fell instead, many of these homeowners defaulted on their debts.
- *Mortgage brokers.* Many providers of home loans encouraged households to borrow excessively. Sometimes they pushed complicated mortgage products with payments that were low initially but exploded later. Some offered what were called NINJA loans (an acronym for "no income, no job or

assets") to households that should not have qualified for a mortgage. The brokers did not hold these risky loans, but instead sold them for a fee after they were issued.

- *Investment banks*. Many of these financial institutions packaged bundles of risky mortgages into mortgage-backed securities and then sold them to buyers (such as pension funds) that were not fully aware of the risks they were taking on.
- *Rating agencies*. The agencies that evaluated the riskiness of debt instruments gave high ratings to various mortgage-backed securities that later turned out to be highly risky. With the benefit of hindsight, it is clear that the models the agencies used to evaluate the risks were based on dubious assumptions.
- *Regulators*. Regulators of banks and other financial institutions are supposed to ensure that these firms do not take undue risks. Yet the regulators failed to appreciate that a substantial decline in housing prices might occur and that, if it did, it could have systemic implications for the financial system.
- *Government policymakers*. For many years, political leaders have pursued policies to encourage homeownership. Such policies include the tax deductibility of mortgage interest and the establishment of Fannie Mae and Freddie Mac, the government-sponsored enterprises that promoted mortgage lending. Households with shaky finances, however, might have been better off renting.

In the end, it seems that each of these groups (and perhaps a few others as well) bear some of the blame. As *The Economist* magazine once put it, the problem was one of "layered irresponsibility."

Finally, keep in mind that this financial crisis was not the first one in history. Such events, though fortunately rare, do occur from time to time. Rather than looking for a culprit to blame for this singular event, perhaps we should view speculative excess and its ramifications as an inherent feature of market economies. Policymakers can respond to financial crises as they happen, and they can take steps to reduce the likelihood and severity of such crises, but preventing them entirely may be too much to ask given our current knowledge.[3] ■

Policy Responses to a Crisis

Because financial crises are both severe and multifaceted, macroeconomic policymakers use various tools, often simultaneously, to try to control the damage. Here we discuss three broad categories of policy responses.

Conventional Monetary and Fiscal Policy As we have seen, financial crises raise unemployment and lower incomes because they lead to a contraction in the aggregate demand for goods and services. Policymakers can mitigate

[3]To read more about the history of financial crises, see Charles P. Kindleberger and Robert Z. Aliber, *Manias, Panics, and Crashes: A History of Financial Crises*, 6th ed. (New York: Palgrave Macmillan, 2011); and Carmen M. Reinhart and Kenneth S. Rogoff, *This Time Is Different: Eight Centuries of Financial Folly* (Princeton, NJ: Princeton University Press, 2009).

these effects by using the tools of monetary and fiscal policy to expand aggregate demand. The central bank can increase the money supply and lower interest rates. The government can increase government spending and cut taxes. That is, a financial crisis can be seen as a shock to the aggregate demand curve, which can, to some degree, be offset by appropriate monetary and fiscal policy.

Policymakers did precisely this during the financial crisis of 2008–2009. To expand aggregate demand, the Federal Reserve cut its target for the federal funds rate from 5.25 percent in September 2007 to approximately zero in December 2008. It then stayed at that low level for the next three years. In February 2008 President Bush signed into law a $168 billion stimulus package, which funded tax rebates of $300 to $1,200 for every taxpayer. In 2009 President Obama signed into law a $787 billion stimulus, which included some tax reductions but also significant increases in government spending. All of these moves were aimed at propping up aggregate demand.

There are limits, however, to how much conventional monetary and fiscal policy can do. A central bank cannot cut its target for the interest rate below zero. (Recall the discussion of the *liquidity trap* in Chapter 12.) Fiscal policy is limited as well. Stimulus packages add to the government budget deficit, which is already enlarged because economic downturns automatically increase unemployment-insurance payments and decrease tax revenue. Increases in government debt are a concern in themselves, because they place a burden on future generations of taxpayers and call into question the government's own solvency. In the aftermath of the financial crisis of 2008–2009, the federal government's budget deficit reached levels not seen since World War II. This explosion of government debt gave rise to the so-called Tea Party movement, whose goal was to reign in government spending. In August 2011, Standard & Poor's responded to the fiscal imbalance by reducing its rating on U.S. government debt below the top AAA level for the first time in the nation's history, a decision that made additional fiscal stimulus more difficult.

The limits of monetary and fiscal policy during a financial crisis naturally lead policymakers to consider other, and sometimes unusual, alternatives. These other types of policy are of a fundamentally different nature. Rather than addressing the symptom of a financial crisis (a decline in aggregate demand), they aim to fix the financial system itself. If the normal process of financial intermediation can be restored, consumers and business will be able to borrow again, and the economy's aggregate demand will recover. The economy can then return to full employment and rising incomes. The next two categories describe the major policies aimed directly at fixing the financial system.

Lender of Last Resort When the public starts to lose confidence in a bank, they withdraw their deposits. In a system of fractional-reserve banking, large and sudden withdrawals can be a problem. Even if the bank is solvent (meaning that the value of its assets exceed the value of its liabilities), it may have trouble satisfying all its depositors' requests. Many of the bank's assets are illiquid—that is, they cannot be easily sold and turned into cash. A business loan to a local restaurant, a car loan to a local family, and a student loan to your roommate, for example, may be valuable assets to the bank, but they cannot be easily used to

satisfy depositors who are demanding their money back immediately. A situation in which a solvent bank has insufficient funds to satisfy its depositors' withdrawals is called a **liquidity crisis**.

The central bank can remedy this problem by lending money directly to the bank. As we discussed in Chapter 4, the central bank can create money out of thin air by, in effect, printing it. (Or, more realistically in our electronic era, it creates a bookkeeping entry for itself that represents those monetary units.) It can then lend this newly created money to the bank experiencing withdrawals and accept the bank's illiquid assets as collateral. When a central bank lends to a bank in the midst of a liquidity crisis, it is said to act as a **lender of last resort**.

The goal of such a policy is to allow a bank experiencing withdrawals to weather the storm of reduced confidence. Without such a loan, the bank might be forced to sell its illiquid assets at fire-sale prices. If such a fire sale were to occur, the value of the bank's assets would decline, and a liquidity crisis could then threaten the bank's solvency. By acting as a lender of last resort, the central bank stems the problem of bank insolvency and helps restore the public's confidence in the banking system.

During 2008 and 2009, the Federal Reserve was extraordinarily active as a lender of last resort. As we discussed in Chapter 4, such activity traditionally takes place at the Fed's discount window, through which the Fed lends to banks at its discount rate. During this crisis, however, the Fed set up a variety of new ways to lend to financial institutions. The financial institutions included were not only conventional banks but also so-called shadow banks. **Shadow banks** are financial institutions that, while not technically banks, serve similar functions. At the time, they were experiencing similar difficulties.

For example, from October 2008 to October 2009, the Fed was willing to make loans to money market mutual funds. Money market funds are not banks, and they do not offer insured deposits. But they are in some ways similar to banks: they take in deposits, invest the proceeds in short-term loans such as commercial paper issued by corporations, and assure depositors that they can obtain their deposits on demand with interest. In the midst of the financial crisis, depositors worried about the value of the assets the money market funds had purchased, so these funds were experiencing substantial withdrawals. The shrinking deposits in money market funds meant that there were fewer buyers of commercial paper, which in turn made it hard for firms that needed the proceeds from these loans to finance their continuing business operations. By its willingness to lend to money market funds, the Fed helped maintain this particular form of financial intermediation.

It is not crucial to learn the details of the many new lending facilities the Fed established during the crisis. Indeed, many of these programs were closed down as the economy started to recover because they were no longer needed. What is important to understand is that these programs, both old and new, have one purpose: to ensure that the financial system remains liquid. That is, as long as a bank (or shadow bank) had assets that could serve as reliable collateral, the Fed stood ready to lend money to the financial institution so that its depositors could make withdrawals.

Injections of Government Funds The final category of policy responses to a financial crisis involves the government using public funds to prop up the financial system.

The most direct action of this sort is a giveaway of public funds to those who have experienced losses. Deposit insurance is one example. Through the Federal Deposit Insurance Corporation (FDIC), the federal government promises to make up for losses that a depositor experiences when a bank becomes insolvent. In 2008, the FDIC increased the maximum deposit it would cover from $100,000 to $250,000. Its goal was to assure bank depositors that their funds were safe.

Giveaways of public funds can also occur on a more discretionary basis. For example, in 1984 a large bank called Continental Illinois found itself on the brink of insolvency. Because Continental Illinois had so many relationships with other banks, regulators feared that allowing it to fail would threaten the entire financial system. As a result, the FDIC promised to protect all of its depositors, not just those under the insurance limit. Eventually, it bought the bank from shareholders, added capital, and sold it to Bank of America. This policy operation cost taxpayers about $1 billion. It was during this episode that a congressman coined the phrase "too big to fail" to describe a firm so central to the financial system that policymakers would not allow it to enter bankruptcy.

Another way for the government to inject public funds is to make risky loans. Normally, when the Federal Reserve acts as lender of last resort, it does so by lending to a financial institution that can pledge good collateral. But if the government makes loans that might not be repaid, it is putting public funds at risk. If the loans do indeed default, taxpayers end up losing.

During the financial crisis of 2008–2009, the Fed engaged in a variety of risky lending. In March 2008, it made a $29 billion loan to JPMorgan Chase to facilitate its purchase of the nearly insolvent Bear Stearns. The only collateral the Fed received was Bear's holdings of mortgage-backed securities, which were of dubious value. Similarly, in September 2008, the Fed lent $85 billion to prop up the insurance giant AIG, which faced large losses from having insured the value of some mortgage-backed securities (through an agreement called a credit default swap). The Fed took these actions to prevent Bear Stearns and AIG from entering a long bankruptcy process, which could have further threatened the financial system.

A final way for the government to use public funds to address a financial crisis is for the government itself to inject capital into financial institutions. In this case, rather than being just a creditor, the government gets an ownership stake in the companies. The AIG loans in 2008 had significant elements of this: as part of the loan deal, the government got warrants (options to buy stock) and so eventually owned most of the company. A clearer example is the capital injections organized by the U.S. Treasury in 2008 and 2009. As part of the Troubled Asset Relief Program (TARP), the government put hundreds of billions of dollars into various banks in exchange for equity shares in those banks. The goal of the program was to maintain the banks' solvency and keep the process of financial intermediation intact.

Not surprisingly, the use of public funds to prop up the financial system, whether done with giveaways, risky lending, or capital injections, is controversial. Critics assert that it is unfair to taxpayers to use their resources to rescue financial market participants from their own mistakes. Moreover, the prospect of such financial

bailouts may increase moral hazard because when people believe the government will cover their losses, they are more likely to take excessive risks. Financial risk taking becomes "heads I win, tails the taxpayers lose." Advocates of these policies acknowledge these problems, but they point out that risky lending and capital injections could actually make money for taxpayers if the economy recovers. More important, they believe that the costs of these policies are more than offset by the benefits of averting a deeper crisis and more severe economic downturn.

Policies to Prevent Crises

In addition to the question of how policymakers should respond once facing a financial crisis, there is another key policy debate: how should policymakers prevent future financial crises? Unfortunately, there is no easy answer. But here are four areas where policymakers have been considering their options and, in some cases, revising their policies.

Focusing on Shadow Banks Traditional commercial banks are heavily regulated. One justification is that the government insures some of their deposits through the FDIC. Policymakers have long understood that deposit insurance produces a moral hazard problem. Because of deposit insurance, depositors have no incentive to monitor the riskiness of banks in which they make their deposits; as a result, bankers have an incentive to make excessively risky loans, knowing they will reap any gains while the deposit insurance system will cover any losses. In response to this moral hazard problem, the government regulates the risks that banks take.

Much of the crisis of 2008–2009, however, concerned not traditional banks but rather *shadow banks*—financial institutions that (like banks) are at the center of financial intermediation but (unlike banks) do not take in deposits insured by the FDIC. Bear Sterns and Lehman Brothers, for example, were investment banks and, therefore, subject to less regulation. Similarly, hedge funds, insurance companies, and private equity firms can be considered shadow banks. These institutions do not suffer from the traditional problem of moral hazard arising from deposit insurance, but the risks they take may nonetheless be a concern of public policy because their failure can have macroeconomic ramifications.

Many policymakers have suggested that these shadow banks should be limited in how much risk they take. One way to do that would be to require that they hold more capital, which would in turn limit these firms' ability to use leverage. Advocates of this idea say it would enhance financial stability. Critics say it would limit these institutions' ability to do their job of financial intermediation.

Another issue concerns what happens when a shadow bank runs into trouble and nears insolvency. Legislation passed in 2010, the so-called Dodd-Frank Act, gave the FDIC *resolution authority* over shadow banks, much as it already had over traditional commercial banks. That is, the FDIC can now take over and close a nonbank financial institution if the institution is having trouble and the FDIC believes it could create systemic risk for the economy. Advocates of this new law believe it will allow a more orderly process when a shadow bank fails and thereby prevent a more general loss of confidence in the financial system. Critics fear it will make bailouts of these institutions with taxpayer funds more common and exacerbate moral hazard.

FYI

CoCo Bonds

One intriguing idea for reforming the financial system is to introduce a new financial instrument called "contingent, convertible debt," sometimes simply called *CoCo bonds*. The proposal works as follows: require banks, or perhaps a broader class of financial institutions, to sell some debt that can be converted into equity when these institutions are deemed to have insufficient capital.

This debt would be a form of preplanned recapitalization in the event of a financial crisis. Unlike the bank rescues in 2008–2009, however, the recapitalization would have the crucial advantage of being done with private, rather than taxpayer, funds. That is, when things go bad and a bank approaches insolvency, it would not need to turn to the government to replenish its capital. Nor would it need to convince private investors to chip in more capital in times of financial stress. Instead, the bank would simply convert the CoCo bonds it had previously issued, wiping out one of its liabilities. The holders of the CoCo bonds would no longer be creditors of the bank; they would be given shares of stock and become part owners. Think of it as crisis insurance.

Some bankers balk at this proposal because it would raise the cost of doing business. The buyers of these CoCo bonds would need to be compensated for providing this insurance. The compensation would take the form of a higher interest rate than would be earned on standard bonds without the conversion feature.

But this contingent, convertible debt would make it easier for the financial system to weather a future crisis. Moreover, it would give bankers an incentive to limit risk by, say, reducing leverage and maintaining strict lending standards. The safer these financial institutions are, the less likely the contingency would be triggered and the less they would need to pay to issue this debt. By inducing bankers to be more prudent, this reform could reduce the likelihood of financial crises.

CoCo bonds are still a new and untried idea, but they may offer one tool to guard against future financial crises. In 2011, the European Banking Authority established guidelines for the issuance of these bonds. How prevalent they will become in the future remains to be seen.

Restricting Size The financial crisis of 2008–2009 centered on a few very large financial institutions. Some economists have suggested that the problem would have been averted, or at least would have been less severe, if the financial system had been less concentrated. When a small institution fails, bankruptcy law can take over as it usually does, adjudicating the claims of the various stakeholders, without resulting in economy-wide problems. These economists argue that if a financial institution is too big to fail, it is too big.

Various ideas have been proposed to limit the size of financial firms. One would be to restrict mergers among banks. (Over the past half century, the banking industry has become vastly more concentrated, largely through bank mergers.) Another idea is to require higher capital requirements for larger banks. Advocates of these ideas say that a financial system with smaller firms would be more stable. Critics say that such a policy would prevent banks from taking advantage of economies of scale and that the higher costs would eventually be passed on to the bank's customers.

Reducing Excessive Risk Taking The financial firms that failed during the financial crisis of 2008–2009 did so because they took risks that ended up losing

large sums of money. Some observers believe that one way to reduce the risk of future crises is to limit excessive risk taking. Yet because risk taking is at the heart of what many financial institutions do, there is no easy way to draw the line between excessive and appropriate risks.

Nonetheless, the Dodd-Frank Act included several provisions aimed at limiting risk taking. Perhaps the best known is the so-called Volcker rule, named after Paul Volcker, the former Federal Reserve chairman who first proposed it. Under the Volcker rule, commercial banks are restricted from making certain kinds of speculative investments. Advocates say the rule will help protect banks. Critics say that by restricting the banks' trading activities, it will make the market for those speculative financial instruments less liquid.

Making Regulation Work Better The financial system is diverse, with many different types of firms performing various functions and having developed at different stages of history. As a result, the regulatory apparatus overseeing these firms is highly fragmented. The Federal Reserve, the Office of the Comptroller of the Currency, and the FDIC all regulate commercial banks. The Securities and Exchange Commission regulates investment banks and mutual funds. Individual state agencies regulate insurance companies.

After the financial crisis of 2008–2009, policymakers tried to improve the system of regulation. The Dodd-Frank Act created a new Financial Services Oversight Council, chaired by the Secretary of Treasury, to coordinate the various regulatory agencies. It also created a new Office of Credit Ratings to oversee the private credit rating agencies, which were blamed for failing to anticipate the great risk in many mortgage-backed securities. The law also established a new Consumer Financial Protection Bureau, with the goal of ensuring fairness and transparency in how financial firms market their products to consumers. Only time will tell whether this new regulatory structure works better than the old one.

CASE STUDY

The European Sovereign Debt Crisis

As this book was going to press in early 2012, many of the nations of Europe were struggling to prevent a financial crisis. The problem stemmed from sovereign debt—that is, debt issued by governments. For many years, banks and bank regulators had treated such debt as risk-free. The central governments of Europe, they presumed, would always honor their obligations. Because of this belief, these bonds paid a lower interest rate and commanded a higher price than they would have if they had been perceived as less reliable credit risks.

In 2010, however, financial market participants started to doubt that this optimism about European governments was warranted. The problem began with Greece. In 2010, Greek debt (net financial liabilities) had increased to 116 percent of its GDP, compared to a European average of 58 percent. Moreover, it seemed that for years Greece had been misreporting the state of its finances and that it had no plan to rein in its soaring debts. In April 2010, Standard & Poor's

reduced the rating on Greek debt to junk status, indicating a particularly poor credit risk. Because many feared that default was likely, the prices of Greek debt fell, and the interest rate that Greece had to pay on new borrowing rose markedly. By the summer of 2011, the interest rate on Greek debt was 26 percent. In November of that year, it rose to over 100 percent.

European policymakers were concerned that problems in Greece could have repercussions throughout Europe. Many European banks held Greek debt among their assets. As the value of Greek debt fell, the banks were pushed toward insolvency. A Greek default could push many banks over the edge, leading to a broader crisis in confidence, a credit crunch, and an economic downturn.

As a result, policymakers in healthier European economies, such as Germany and France, helped arrange continuing loans to Greece to prevent an immediate default. Some of these loans were from the European Central Bank, which controls monetary policy in the euro area. This policy move was not popular. Voters in Germany and France wondered why their tax dollars should help rescue the Greeks from their own fiscal profligacy. Voters in Greece, meanwhile, were also unhappy because these loans came with the conditions that Greece drastically cut government spending and raise taxes. These austerity measures led to rioting in Greek streets.

Making matters worse was that Greece was not the only country with such problems. If Greece was allowed to default, rather than being bailed out by its richer neighbors, some feared that Portugal, Ireland, Spain, and Italy would be close behind. A widespread decline in the value of the sovereign debt of all these nations would surely put serious strains on the European banking system. And since the world's banking systems are highly interconnected, it would put strains on the rest of the world as well.

How this situation would play out was not clear. As this book was heading to the printer, it was clear that Greece would not repay all its creditors in full. Negotiations were under way among European leaders regarding how much Greece would pay on its debts and how much its richer neighbors would contribute to help solve its fiscal problems. Some feared that the crisis in Europe could lead to a new recession in the United States, which was still weak in the aftermath of its own financial crisis a couple years earlier. ■

20-3 Conclusion

Throughout history, financial crises have been a major source of economic fluctuations and a main driver of economic policy. In 1873 Walter Bagehot published a celebrated book called *Lombard Street* about how the Bank of England should manage a financial crisis. His recommendation that it should act as a lender of last resort has over time become the conventional wisdom. In 1913, in the aftermath of the banking panic of 1907, Congress passed the act establishing the Federal Reserve. Congress wanted the new central bank to oversee the banking system in order to ensure greater financial and macroeconomic stability.

The Fed has not always been successful in accomplishing this goal. To this day, many economists believe that the Great Depression was so severe because the Fed failed to follow Bagehot's advice and act as lender of last resort. If it had acted more aggressively, the crisis of confidence in the banks and the resulting collapse in the money supply and aggregate demand might have been averted. Mindful of this history, the Fed played a much more active role in trying to mitigate the impact of the financial crisis of 2008–2009.

Following a crisis, it is easy to lament the problems caused by the financial system, but we should not lose sight of the great benefits that the system brings. The financial system gives savers the ability to earn the best possible rate of return at the lowest possible risk. It gives entrepreneurs the ability to fund their ideas for new business ventures. By bringing together those who want to save and those who want to invest, the financial system promotes economic growth and overall prosperity.

Summary

1. A central purpose of the financial system is to direct the resources of savers into the hands of borrowers who have investment projects to finance. Sometimes this task is done directly through the stock and bond markets. Sometimes it is done indirectly through financial intermediaries such as banks.
2. Another purpose of the financial system is to allocate risk among market participants. The financial system allows individuals to reduce the risk they face through diversification.
3. Financial arrangements are rife with asymmetric information. Because entrepreneurs know more about the inherent quality of their ventures than do those providing the financing, there is a problem of adverse selection. Because entrepreneurs know more about the decisions they make and actions they take, there is a problem of moral hazard. Financial institutions such as banks mitigate (but do not completely solve) the problems that arise from asymmetric information.
4. Because the accumulation and allocation of capital are a source of economic growth, a well-functioning financial system is a key element of long-run economic prosperity.
5. Crises in the financial system begin when a decline in asset prices, often after a speculative bubble, causes insolvency in some highly leveraged financial institutions. These insolvencies then lead to falling confidence in the overall system, which in turn causes depositors to withdraw funds and induces banks to reduce lending. The ensuing credit crunch reduces aggregate demand and leads to a recession, which, in a vicious circle, exacerbates the problem of rising insolvencies and falling confidence.

6. Policymakers can respond to a financial crisis in three ways. First, they can use conventional monetary and fiscal policy to expand aggregate demand. Second, the central bank can provide liquidity by acting as a lender of last resort. Third, policymakers can use public funds to prop up the financial system.
7. Preventing financial crises is not easy, but policymakers have tried to reduce the likelihood of future crises by focusing more on regulating shadow banks, by restricting the size of financial firms, by trying to limit excessive risk taking, and by reforming the regulatory agencies that oversee the financial system.

KEY CONCEPTS

Financial system
Financial markets
Bond
Stock
Debt finance
Equity finance
Financial intermediaries
Risk averse
Diversification
Mutual funds
Asymmetric information
Adverse selection
Moral hazard
Financial crisis
Speculative bubble
Leverage
Fire sale
Liquidity crisis
Lender of last resort
Shadow banks

QUESTIONS FOR REVIEW

1. Explain the difference between debt finance and equity finance.
2. What is the main advantage of holding a stock mutual fund over an individual stock?
3. What are adverse selection and moral hazard? How do banks mitigate these problems?
4. How does the leverage ratio influence a financial institution's stability in response to bad economic news?
5. Explain how a financial crisis reduces the aggregate demand for goods and services.
6. What does it mean for a central bank to act as lender of last resort?
7. What are the pros and cons of using public funds to prop up a financial system in crisis?

PROBLEMS AND APPLICATIONS

1. In each of the following cases, identify whether the problem is adverse selection or moral hazard, and explain your answer. How might the problem be dealt with?
   a. Rick has gotten a large advance to write a textbook. With the money in hand, he prefers spending his time sailing rather than sitting in his office working on the book.
   b. David is trying to get a large advance to write a textbook. He knows, but publishers don't, that he did poorly on the writing portion of the SAT.
   c. Brenda is buying a life insurance policy. She knows that members of her family tend to die young.

d. Maria, who has a large life insurance policy, spends her vacation pursuing her favorite hobbies: skydiving, bungee jumping, and bullfighting.

2. Nation A has a well-developed financial system, where resources flow to the capital investments with the highest marginal product. Nation B has a less developed financial system from which some would-be investors are excluded.

a. Which nation would you expect to have a higher level of total factor productivity? Explain. (*Hint*: See the appendix to Chapter 9 for the definition of total factor productivity.)

b. Suppose that the two nations have the same saving rate, depreciation rate, and rate of technological progress. According to the Solow growth model, how does output per worker, capital per worker, and the capital–output ratio compare in the two countries?

c. Assume the production function is Cobb–Douglas. Compare the real wage and the real rental price of capital in the two countries.

d. Who benefits from having a better-developed financial system?

3. Some commentators argue that when a financial firm is rescued by the government in the midst of a financial crisis, the firm's equity holders should be wiped out, but the firm's creditors should be protected. Does this solve the moral hazard problem? Why or why not?

4. In recent years, as described in this chapter, both the United States and Greece have experienced increases in government debt and a significant economic downturn. In what ways were the two situations similar? In what ways were they different? Why did the two nations have different policy options at their disposal?