



*The task of economic stabilization requires keeping the economy from straying too far above or below the path of steady high employment. One way lies inflation, and the other lies recession. Flexible and vigilant fiscal and monetary policy will allow us to hold the narrow middle course.*

President John F. Kennedy  
(1962)

The U.S. economy has changed enormously over the last 50 years. The shares of farming and manufacturing have declined. People work with computers instead of with tractors. Trade is a growing share of production and consumption. Technology has revolutionized daily life. Advanced telecommunications systems enable businesses to control their operations across the country and around the world, and ever more powerful computers have eliminated many of the tedious tasks that used to employ so many people.

Yet, even with these tectonic shifts in our economic structure, the central goals of macroeconomic policy remain the same: stable employment, good pay, low unemployment, rising productivity and real incomes, and low and stable inflation. The challenge remains to find policies that can achieve these objectives.

This chapter uses the tools of macroeconomics to examine some of today's major policy issues. We begin with an assessment of the consequences of government deficits and debt on economic activity. We then present some of the new approaches to

macroeconomics. Some of these theories are on the frontiers of our science today but will be the staples of classroom economics in a generation. We analyze controversies involving short-run economic stabilization, including current questions on the roles of monetary and fiscal policy. Should the government stop trying to smooth out business cycles? Should policy makers rely on fixed rules rather than discretion? We then conclude with an epilogue on the importance of economic growth.

### **A. THE ECONOMIC CONSEQUENCES OF THE GOVERNMENT DEBT**

As the United States entered the twenty-first century, its fiscal policies were stable and the federal government was running a budget surplus. Then, like a monster rising from the deep, the budget deficit rose up to swallow the nation's fiscal resources and terrify its populace.

The budget deficit increased even during the prosperous years of the mid-2000s as taxes were cut and spending increased on new entitlement programs and seemingly endless wars in Iraq and Afghanistan. Then, the nation's banking system ran mammoth losses and the economy went into a deep recession. Tax revenues fell sharply, and hundreds of billions of dollars were spent to prop up the financial system and stimulate the economy. For 2009, the federal government was running an annual deficit of close to \$2 trillion, which was the largest percent of GDP since World War II.

How did the budget deficit get so high? What are the economic impacts of fiscal deficits? These important questions will be addressed in this section. We will see that the popular concern with deficits has a firm economic foundation. Deficit spending may be necessary to reduce the length and depth of recessions, particularly when the economy is in a liquidity trap. But high deficits during periods of full employment carry serious consequences, including reduced national saving and investment and slower long-run economic growth.

**Government Budgets.** Governments use budgets to plan and control their fiscal affairs. A **budget** shows, for a given year, the planned expenditures of government programs and the expected revenues from tax systems. The budget typically contains a list of specific programs (education, welfare, defense, etc.), as well as tax sources (individual income tax, social-insurance taxes, etc.).

A **budget surplus** occurs when all taxes and other revenues exceed government expenditures for a year. A **budget deficit** is incurred when expenditures exceed taxes. When revenues and expenditures are equal during a given period—a rare event on the federal level—the government has a **balanced budget**.

When the government incurs a budget deficit, it must borrow from the public to pay its bills. To borrow, the government issues bonds, which are IOUs that promise to pay money in the future. The **government debt** (sometimes called the *public debt*) consists of the total or accumulated borrowings by the government; it is the total dollar value of government bonds.

It is useful to distinguish between the total debt and the net debt. The *net debt*, also called the *debt held by the public*, excludes debt held by the government itself. Net debt is owned by households, banks, businesses, foreigners, and other nonfederal entities.

The *gross debt* equals the net debt plus bonds owned by the government, primarily by the social security trust fund. The social security trust fund is running a large surplus, so the difference between these two concepts is growing rapidly today.



#### Debt versus Deficit

People often confuse the debt with the deficit. You can remember the difference as follows: Debt is water in the tub, while

a deficit is water flowing into the tub. The government debt is the *stock* of liabilities of the government. The deficit is a *flow* of new debt incurred when the government spends more than it raises in taxes. For example, when the government ran a deficit of \$640 billion in 2008, it added that amount to the stock of government debt. By contrast, when the government enjoyed a surplus of \$200 billion in 2000, this reduced the government debt by that amount.

## FISCAL HISTORY

Like Sisyphus, federal policymakers toil endlessly to push the stone of fiscal balance up the hill only to have it roll down to crush them again. The government passed law after law in the 1980s and 1990s to stop the rising deficit. No sooner was the deficit vanquished than it reappeared and grew rapidly after 2001. Was this typical, or was it a new feature of the American economy?

Deficits were not new to the American economy, but large deficits during peacetime are a unique feature of recent economic history. For the first two centuries after the American Revolution, the federal government of the United States generally balanced its budget. Heavy military spending during wartime was financed by borrowing, so the government debt soared in wartime. In peacetime, the government would pay off some of its debt, and the debt burden would shrink.

Then, starting in 1940, the fiscal affairs of state began to change rapidly. Table 31-1 illuminates the major trends. This table lists the major federal budget categories and their shares in GDP for the period from 1940 to 2008. The key features were the following:

- The share of federal spending and taxes grew sharply from 1940 to 1960 primarily because of the expansion of military and civilian spending. This growth was financed by a significant increase in individual and corporate taxation.

Federal budget component	Percent of GDP				
	1940	1960	1980	2000	2008
<b>Revenues</b>	<b>6.4</b>	<b>17.6</b>	<b>18.5</b>	<b>20.6</b>	<b>17.7</b>
Individual income taxes	0.9	7.7	8.8	10.2	8.1
Corporation income taxes	1.2	4.1	2.3	2.1	2.1
Social insurance and retirement receipts	1.8	2.8	5.7	6.7	6.3
Other	2.7	3.0	1.8	1.6	1.2
<b>Expenditures</b>	<b>9.4</b>	<b>17.5</b>	<b>21.2</b>	<b>18.2</b>	<b>20.9</b>
National defense and international affairs	1.8	9.7	5.3	3.2	4.4
Health	0.1	0.2	2.0	3.6	4.7
Income security	1.5	1.4	3.1	2.6	3.0
Social security	0.0	2.2	4.2	4.2	4.3
Net interest	0.9	1.3	1.9	2.3	1.7
Other	5.2	2.7	4.7	2.4	2.5
<b>Surplus or deficit</b>	<b>-2.9</b>	<b>0.1</b>	<b>-2.6</b>	<b>2.4</b>	<b>-3.2</b>

**TABLE 31-1. Federal Budget Trends, 1940–2008**

The federal share of the economy grew sharply from 1940 to 1960 as the United States took an active military role in world affairs during the hot and cold wars. After 1960, the federal-spending share stabilized, but the composition of spending moved from military to health care and other social spending. The federal government deficit grew sharply in the 2000s as revenues declined sharply due to individual income-tax cuts.

Source: Data are for fiscal years and come from the Department of the Treasury, Office of Management and Budget, and Department of Commerce. They are summarized in *Economic Indicators*, available at [origin.www.gpoaccess.gov/indicators/](http://origin.www.gpoaccess.gov/indicators/).

- The period from 1960 to 1980 marked the “New Society” programs for health, income security, and expanded social security. As a result, the expenditure share grew sharply. The share of federal revenues in GDP stabilized over this period.
- Beginning in 1981, both political parties declared that the era of big government was over. Presidents Ronald Reagan and George W. Bush introduced large tax cuts, which in each case led to large government budget deficits. From 1980 to 2008, as shown in Table 31-1, the ratio of total federal spending to GDP was essentially constant. Spending on health care rose sharply as other civilian programs were squeezed.

## GOVERNMENT BUDGET POLICY

The government budget serves two major economic functions. First, it is a device by which the government can set national priorities, allocating national output

among private and public consumption and investment and providing incentives to increase or reduce output in particular sectors. From a macroeconomic point of view, it is through fiscal policy that the budget affects the key macroeconomic goals. More precisely, by **fiscal policy** we mean the setting of taxes and public expenditures to help dampen the swings of the business cycle and contribute to the maintenance of a growing, high-employment economy, free from high or volatile inflation.

Some early enthusiasts of the Keynesian approach believed that fiscal policy was like a knob they could turn to control or “fine-tune” the pace of the economy. A bigger budget deficit meant more stimulus for aggregate demand, which could lower unemployment and pull the economy out of recession. A budget surplus could slow down an overheated economy and dampen the threat of inflation.

Few today hold such an idealized view of fiscal policy. With many decades of practice, economies

still experience recessions and inflations. Fiscal policy works better in theory than in practice. Moreover, monetary policy has become the preferred tool for moderating business-cycle swings. Still, when unemployment rises, there is usually strong public pressure for the government to boost spending. In this section, we will review the major ways in which the government can employ fiscal policy, and we will examine the practical shortcomings that have become apparent.

### **Actual, Structural, and Cyclical Budgets**

Modern public finance distinguishes between structural and cyclical deficits. The idea is simple. The *structural* part of the budget is active—determined by discretionary policies such as those covering tax rates, public-works or education spending, or the size of defense purchases. In contrast, the *cyclical* part of the budget is determined passively by the state of the business cycle, that is, by the extent to which national income and output are high or low. The precise definitions follow:

The **actual budget** records the actual dollar expenditures, revenues, and deficits in a given period.

The **structural budget** calculates what government revenues, expenditures, and deficits would be if the economy were operating at potential output.

The **cyclical budget** is the difference between the actual budget and the structural budget. It measures the impact of the business cycle on the budget, taking into account the effect of the cycle on revenues, expenditures, and the deficit.

The distinction between the actual and the structural budgets is important for policymakers who want to distinguish between long-term or trend budget changes and short-term changes that are primarily driven by the business cycle. Structural spending and revenues consist of the discretionary programs enacted by the legislature; cyclical spending and deficits consist of the taxes and spending that react automatically to the state of the economy.

The nation's saving and investment balance is primarily affected by the structural budget. Efforts to change government saving should focus on the structural budget because no durable change comes simply from higher revenues due to an economic boom.

## **THE ECONOMICS OF THE DEBT AND DEFICITS**

No macroeconomic issue is more controversial today than the impact of large government deficits upon the economy. Some argue that large deficits are placing a heavy burden on future generations. Others rejoin that there is little evidence of an impact of deficits on interest rates or investment. Yet a third group argues that deficits are favorable for the economy in recessionary times.

How can we sort through the conflicting points of view? At one extreme, we must avoid the customary practice of assuming that a public debt is bad because private debtors are punished. On the other hand, we must recognize the genuine problems associated with large government deficits and the advantages that come from a lower government debt.

## **THE SHORT-RUN IMPACT OF GOVERNMENT DEFICITS**

### **Short Run vs. Long Run**

It is useful to separate the impact of fiscal policy into the short run and the long run. The *short run* in macroeconomics considers situations where less than full employment may prevail—that is, where actual output may differ from potential output. This is the world of the Keynesian multiplier model. The *long run* refers to a full-employment situation, where actual output equals potential output. This is the world of our economic-growth analysis.

We have already discussed the role of fiscal policy in the short run, so that needs only a brief review in this section. The impact in the long run is more novel and will be presented in the next section.

### **Fiscal Policy and the Multiplier Model**

We discussed in earlier chapters the way that fiscal policy affects the economy in the short run—that is, in an economy with less than full employment.

Suppose that the government purchases computers for its schools or missiles for its army. Our multiplier model says that in the short run, with no change in interest or exchange rates, GDP will rise by a multiple (perhaps  $1\frac{1}{2}$  or 2) times the increase in  $G$ . The same argument applies (with a smaller multiplier) to reductions in taxes,  $T$ . At the same time, the

government deficit will rise because the deficit equals  $T - G$  and thus rises with  $T$  cuts or  $G$  increases.

This then is the basic result for the short run: With less than full employment, increases in the structural deficit arising from discretionary  $T$  cuts or  $G$  increases will tend to produce higher output and lower unemployment, and perhaps higher inflation.

We must, however, expand on the simplest multiplier analysis to incorporate the reactions of financial markets and monetary policy. As output rises and inflation threatens, central banks may raise interest rates, discouraging domestic investment. Higher interest rates may also cause a country's foreign exchange rate to appreciate if the country has a flexible exchange rate; the appreciation leads to a decline in net exports. These financial reactions would tend to choke off or "crowd out" investment, with a resulting decrease in the expenditure multiplier of our simplest model.

Fiscal policy tends to expand the economy in the short run—that is, when there are unemployed resources. Higher spending and lower tax rates increase aggregate demand, output, employment, and inflation. However, this expansionary impact is reduced by the subsequent financial reactions of interest rates and foreign exchange rates.

GOVERNMENT DEBT AND ECONOMIC GROWTH

We turn now from the short run to the long run—to the impact of fiscal policy, and particularly a large government debt, on investment and economic growth. The analysis here deals with the costs of servicing a large external debt, the inefficiencies of levying taxes to pay interest on the debt, and the impact of the debt on capital accumulation.

Historical Trends

Before we begin our analysis of government debt, it is useful to review historical trends. Long-run data for the United States appear in the figure on page 716 of this text, which shows the ratio of net federal debt to GDP since 1789. Notice how wars drove up the ratio of debt to GDP, while rapid output growth with generally balanced budgets in peacetime reduced the ratio of debt to GDP.

Figure 31-1 shows the debt-GDP ratio for the United States over the last seven decades. You can see the

dramatic effect of government deficits during World War II, as well as during the 1980s and the 2000s.

Most industrialized countries are today saddled with large public debts. Table 31-2 compares the United States with seven other large countries. Japan's debt-GDP ratio has climbed sharply over the last two decades because of the nation's aggressive fiscal policy and a prolonged recession. Many economists worry that Japan is caught in a vicious cycle of high debt leading to high interest payments, which in turn increase the growth of the debt.

External vs. Internal Debt

The first distinction to be made is between an internal debt and an external debt. *Internal government debt* is owed by a nation to its own residents. Many argue that an internal debt poses no burden because "we owe it all to ourselves." While this statement is oversimplified, it does represent a genuine insight. If each citizen owned \$10,000 of government bonds and were liable for the taxes to service just that debt, it would make no sense to think of debt as a heavy load of rocks that each citizen must carry. People simply owe the debt to themselves.

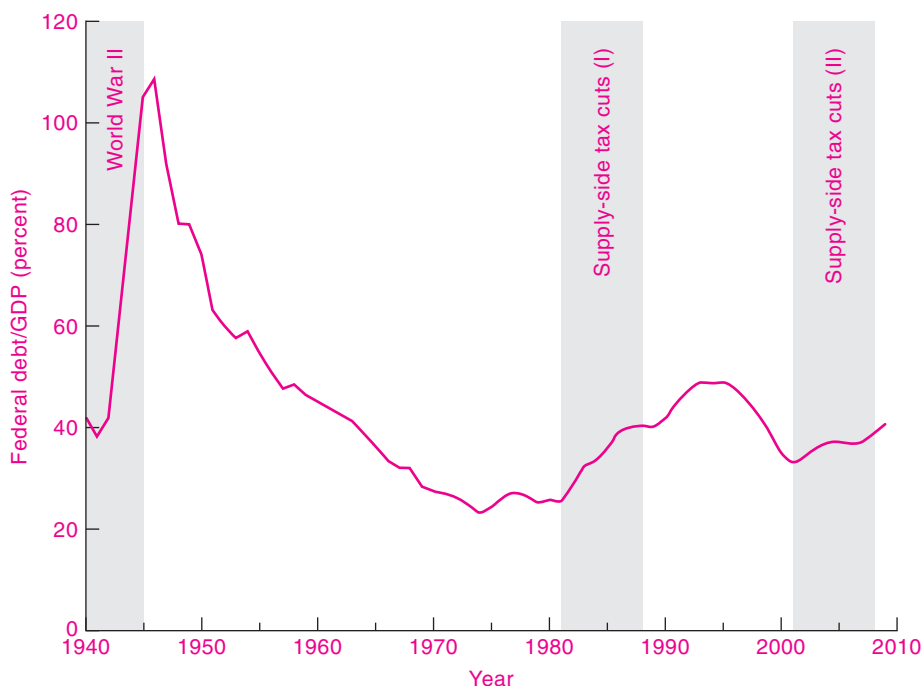
An external debt is quite a different situation. An *external debt* occurs when foreigners own a fraction of the assets of a country. For example, because of

	Ratio of Gross Government Debt to GDP (%)			
	1980	1990	2000	2007
Japan	37	47	106	161
Italy	53	93	104	96
France	30	40	47	52
United Kingdom	51	35	43	43
Germany	13	20	34	39
United States	26	41	34	36
South Korea	4	13	17	32
Mexico	18	46	23	24

TABLE 31-2. Central-Government Debt in Eight Major Countries

Slow economic growth and rising spending on entitlement programs led to growing public debts in most major countries in the last three decades. Japan's debt-GDP ratio led to a downgrading of the nation's debt rating even though Japan is one of the world's richest countries.

Source: OECD at [webnet.oecd.org/wbos/index.aspx](http://webnet.oecd.org/wbos/index.aspx).



**FIGURE 31-1. Debt-GDP Ratio for the U.S. Federal Government**

This figure shows the ratio of net debt, or debt in the hands of the public, to GDP. See the effect of World War II and the two periods of supply-side tax cuts on the ratio.

Source: U.S. Office of Management and Budget, available at [www.gpoaccess.gov/eop/tables08.html](http://www.gpoaccess.gov/eop/tables08.html), Table B-78.

its large current-account deficits, the United States owed the rest of the world \$3 trillion at the end of 2008. What this means is that U.S. residents will eventually have to export that much in goods and services or sell that much of the nation's assets to foreigners. Suppose that the real interest rate on that debt is 5 percent per year. Then, each year, U.S. residents would need to ship abroad \$150 billion (about \$500 per capita) to "service" the external debt.

So an external debt definitely does involve a net subtraction from the resources available for consumption in the debtor nation. This lesson has been learned time and again by developing countries—particularly when their creditors wanted their debts paid back quickly.

### Efficiency Losses from Taxation

An internal debt requires payments of interest to bondholders, and taxes must be levied for this purpose. But even if the same people were taxed to pay the same

amounts they receive in interest, there would still be the *distorting effects on incentives* that are inescapably present in the case of any taxes. Taxing Paula's interest income or wages to pay Paula interest would introduce microeconomic distortions. Paula might work less and save less; either of these outcomes must be reckoned as a distortion of efficiency and well-being.

### Displacement of Capital

Perhaps the most serious consequence of a large public debt is that it displaces capital from the nation's stock of private wealth. As a result, the pace of economic growth slows and future living standards will decline.

What is the mechanism by which debt affects capital? Recall from our earlier discussion that people accumulate wealth for a variety of purposes, such as retirement, education, and housing. We can separate the assets people hold into two groups: (1) government debt and (2) capital like houses and financial assets like corporate stocks that represent ownership of private capital.



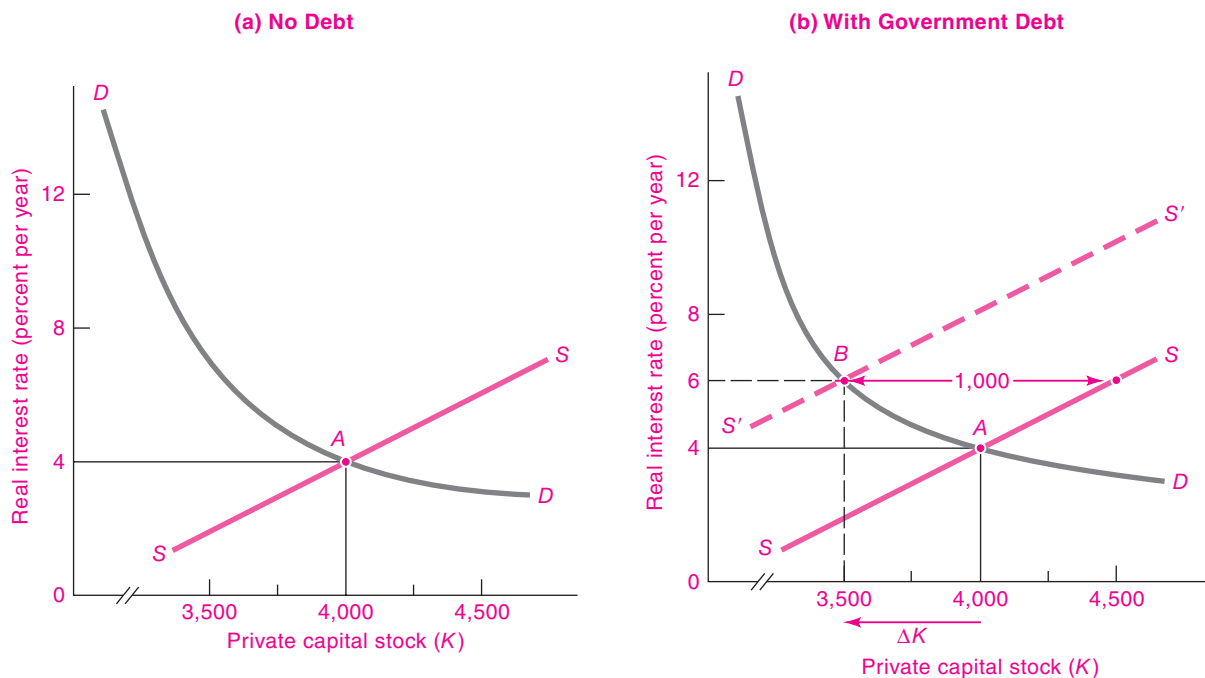
The effect of government debt is that people will accumulate government debt instead of private capital, and the nation's private capital stock will be displaced by public debt.

To illustrate this point, suppose that people desire to hold exactly 1000 units of wealth for retirement and other purposes. As the government debt increases, people's holdings of other assets will be reduced dollar for dollar. This occurs because as the government sells its bonds, other assets must be reduced, since total desired wealth holdings are fixed. But these other assets ultimately represent the stock of private capital; stocks, bonds, and mortgages are the counterparts of factories, equipment, and houses. In this example, if the government debt goes

up 100 units, we would see that people's holdings of capital and other private assets fall by 100 units. This is the case of 100 percent displacement (which is the long-run analog of 100 percent crowding out).

Full displacement is unlikely to hold in practice. The higher debt may increase interest rates and stimulate domestic saving. In addition, the country may borrow abroad rather than reduce its domestic investment (as has been the case for the U.S. in recent years). The exact amount of capital displacement will depend on the conditions of production and on the saving behavior of domestic households and foreigners.

**A Geometric Analysis.** The process by which the stock of capital is displaced in the long run is illustrated in Figure 31-2. The left panel shows the supply



**FIGURE 31-2. Government Debt Displaces Private Capital**

Firms demand capital, while households supply capital by saving in private and public assets. The demand curve is the downward-sloping business demand for  $K$ , while the supply curve is the upward-sloping household supply of wealth.

Before-debt case in (a) shows the equilibrium without government debt:  $K$  is 4000 and the real interest rate is 4 percent.

After-debt case in (b) shows the impact of 1000 units of government debt. Debt shifts the net supply of  $K$  to the left by the 1000 units of the government debt. The new equilibrium arises northwest along the demand-for- $K$  curve, moving from point A to point B. The interest rate is higher, firms are discouraged from holding  $K$ , and the capital stock falls.

and demand for capital as a function of the real interest rate or return on capital. As interest rates rise, firms demand less capital while individuals may want to supply more. The equilibrium shown is for a capital stock of 4000 units with a real interest rate of 4 percent.

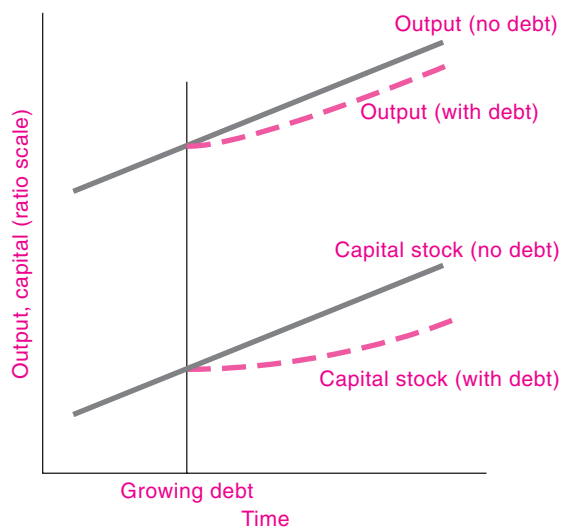
Now say that the government debt rises from 0 to 1000—because of war, recession, supply-side fiscal policies, or some other reason. The impact of the increase in debt can be seen in the right-hand diagram of Figure 31-2. This figure shows the 1000-unit increase in debt as a shift in the supply-of-capital (or  $SS$ ) curve. As depicted, the households' supply-of-capital schedule shifts 1000 units to the left, to  $S'S'$ .

We represent an increase in government debt as a leftward shift in the households' supply-of-capital schedule. Note that, because the  $SS$  curve represents the amount of private capital that people willingly hold at each interest rate, the capital holdings are equal to the total wealth holdings minus the holdings of government debt. Since the amount of government debt (or assets other than capital) rises by 1000, the amount of private capital that people can buy after they own the 1000 units of government debt is 1000 less than total wealth at each interest rate. Therefore, if  $SS$  represents the total wealth held by people,  $S'S'$  (equal to  $SS$  less 1000) represents the total amount of capital held by people. In short, after 1000 units of government debt are sold, the new supply-of-capital schedule is  $S'S'$ .

As the supply of capital dries up—with national saving going into government bonds rather than into housing or into companies' stocks and bonds—the market equilibrium moves northwest along the demand-for- $K$  curve. Interest rates rise. Firms slow their purchases of new factories, trucks, and computers.

In the illustrative new long-run equilibrium, the capital stock falls from 4000 to 3500. Thus, in this example, 1000 units of government debt have displaced 500 units of private capital. Such a reduction has significant economic effects, of course. With less capital, potential output, wages, and the nation's income are lower than they would otherwise be.

The diagrams in Figure 31-2 are illustrative. Economists do not have a firm estimate of the magnitude of the displacement effect. In a look at historical trends, the best evidence suggests that domestic capital is partially displaced by government debt but that some of the impact comes in higher foreign debt.



**FIGURE 31-3. Impact of Government Debt on Economic Growth**

The solid lines show the paths of capital and output if the government balances its books and has no debt. When the government incurs a debt, private capital is reduced. The dashed lines illustrate the impact on capital and output of the higher government debt.

### Debt and Growth

If we consider all the effects of government debt on the economy, a large public debt is likely to reduce long-run economic growth. Figure 31-3 illustrates this connection. Say that an economy were to operate over time with no debt. According to the principles of economic growth outlined in Chapter 25, the capital stock and potential output would follow the hypothetical paths indicated by the solid blue lines in Figure 31-3.

Next consider a situation with a growing national debt. As the debt accumulates over time, more and more capital is displaced, as shown by the dashed green line for the capital stock in the bottom of Figure 31-3. As taxes are raised to pay interest on the debt, inefficiencies further lower output. Also, an increase in external debt lowers national income and raises the fraction of national output that has to be set aside for servicing the external debt. All the effects taken together, output and consumption will grow more slowly than they would have had there been no large government debt and deficit, as can be seen by comparing the top lines in Figure 31-3.



What is the impact of a budget surplus and a *declining* government debt? Here, the argument works in the other direction. A lower national debt means that more of national wealth is put into capital rather than government bonds. A higher capital stock increases the growth of output and increases wages and consumption per person.

**This is the major point about the long-run impact of a large government debt on economic growth: A large government debt tends to reduce the growth in potential output because it displaces private capital, increases the inefficiency from taxation, and forces a nation to reduce consumption to service its foreign borrowing.**



#### Deficit Confusions Unraveled

Having completed our analysis of the economic impacts of deficits and debt, we can summarize the key points by unraveling

some of the major confusions in this area.

The impact of fiscal policy on the economy is one of the most misunderstood facets of macroeconomics. The confusion arises because fiscal policy operates differently depending upon the time period:

- *In the short run, higher spending and lower tax rates tend to increase aggregate demand and thereby to raise output and lower unemployment.* This is the Keynesian impact of fiscal policy, which operates by raising actual output relative to potential output. We would expect that the expansionary impact of fiscal policy—the increase in capacity utilization—would last at most for a few years. It might be offset by a monetary tightening, especially if the central bank thought the economy was operating near the inflation danger zone.
- *In the long run, higher spending and lower tax rates tend to depress the growth rate of the economy.* This is the growth impact of fiscal policy. The growth impact concerns the impact of government deficits on the national saving and investment balance in a full-employment economy. If taxes are lower, this will decrease public saving and, because private saving is unlikely to rise as much as public saving falls, total national saving and investment will decline. The investment decline will lead to slower growth in the capital stock and therefore in potential output.

These two impacts of fiscal policy can easily confuse people and are the source of many debates about fiscal

policy. Consider the following debate between Senators Hawk and Dove:

**Senator Dove:** The economy is tipping into recession.

We cannot afford to sit around while millions of people lose their jobs. Now is the time for a big stimulus package with tax cuts and new spending on infrastructure and pressing public needs. Recessions are not the time for old-fashioned dogmas about deficits.

**Senator Hawk:** A huge stimulus package today would be the height of fiscal irresponsibility. With higher government spending, the deficit will grow even larger, interest rates will rise, and businesses will reduce their spending on new plant, equipment, and information technology. With all the critical needs facing the nation, we can ill-afford slower economic growth over the next decade.

Make sure that you understand the implicit theories underlying the positions of the two distinguished senators. They are both right . . . and both wrong.

## B. ADVANCES IN MODERN MACROECONOMICS

Our philosophy in this textbook is to consider all the important schools of thought. We emphasize the modern mainstream Keynesian approach as the best way to explain the business cycle in market economies. At the same time, the forces behind long-run economic growth are best understood by using the neoclassical growth model.

While our key task has been to present mainstream thinking, experience shows how important it is to keep our minds open to alternative points of view. Time and again in science, the orthodoxies of one era are overturned by new discoveries in the next. Schools, like people, are subject to hardening of the arteries. Students learn the embalmed truth from their teachers and sacred textbooks, and the imperfections in the orthodox doctrines are glossed over as unimportant. For example, John Stuart Mill, one of the greatest economists and philosophers of all time, wrote in his 1848 classic, *Principles of Political Economy*: “Happily, there is nothing in the laws of Value which remains for the present and any future writer to clear up.” Yet the next century and a half

saw two major revolutions in economics—the marginal revolution in microeconomics and the discovery of macroeconomics.

Historians of science observe that the progress of science is discontinuous. New schools of thought rise, spread their influence, and convince skeptics. In this section, we sketch some of the leading new lines of thinking in modern macroeconomics.

## CLASSICAL MACROECONOMICS AND SAY'S LAW

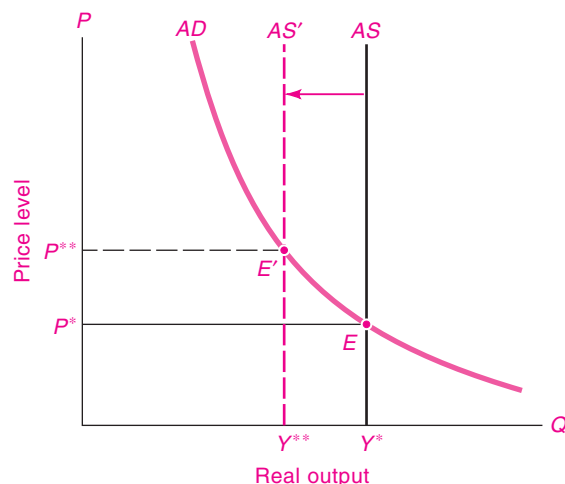
Since the dawn of economics two centuries ago, economists have wondered if a market economy has a tendency to move spontaneously toward a long-run, full-employment equilibrium without the need for government intervention. Using modern language, we label as **classical** those approaches that emphasize the self-correcting forces in an economy. The classical approach holds that prices and wages are flexible and that the economy is stable, so the economy moves automatically and quickly to its full-employment equilibrium.

### Say's Law of Markets

Before Keynes developed his macroeconomic theories, the major economic thinkers generally adhered to the classical view of the economy, at least in good times. Early economists knew about business cycles, but they viewed them as temporary and self-correcting aberrations.

Classical analysis revolved around **Say's Law of Markets**. This theory, advocated in 1803 by the French economist J. B. Say, states that overproduction is impossible by its very nature. This is sometimes expressed as “supply creates its own demand.” This law rests on a view that there is no essential difference between a monetary economy and a barter economy—in other words, people can afford to buy whatever factories can produce. Say's Law is illustrated in Figure 31-4. In the classical world, output is determined by aggregate supply, and aggregate demand affects only the price level.

A long line of the most distinguished economists, including David Ricardo (1817), John Stuart Mill (1848), and Alfred Marshall (1890), subscribed to the classical macroeconomic view that overproduction is impossible.



**FIGURE 31-4.** In the Real Business Cycle, Output Changes Come from Technological Shocks

In the classical as well as the real-business-cycle (RBC) approach,  $AS$  reflects classical flexible wages and prices and is therefore vertical. Output fluctuations come as technological shocks percolate through the economy. This figure shows how a decline in productivity can be the cause of a RBC recession. Can you see why policies to increase  $AD$  will affect prices but not output?

The classical view is that the economy moves automatically toward its full-employment equilibrium. Changes in the money supply, fiscal policy, investment, or other spending factors have no lasting impact upon output or employment. Prices and wages adjust quickly and flexibly to maintain full employment.

## MODERN CLASSICAL MACROECONOMICS

While classical economists were preaching the impossibility of persistent unemployment, eclectic economists of the 1930s could hardly ignore the vast army of unemployed workers begging for work and selling pencils on street corners. Keynes's *The General Theory of Employment, Interest and Money* (1936) offered an alternative macroeconomic theory—a new set of theoretical spectacles for looking at the impacts of shocks and economic policies. The analysis of business cycles and short-run aggregate demand presented in this text reflects the modern synthesis of the Keynesian approach.

While mainstream business-cycle analysis relies primarily on the Keynesian *AS* and *AD* model, a new branch of the classical school challenges the standard approach. This theory, called **new classical macroeconomics**, was developed by Robert Lucas (University of Chicago), Thomas Sargent (Stanford University and New York University), and Robert Barro (Harvard University). This approach is much in the spirit of the classical approach in emphasizing the role of flexible wages and prices, but it also adds a new feature called rational expectations to explain observations such as the Phillips curve.

### Rational Expectations

The major innovation of new classical economics has been to introduce the principle of rational expectations into macroeconomics. Some background on expectations will help to explain this new approach. In many areas of economics, particularly those involving investment and financial decisions, expectations are a central factor in decision making. They influence how much businesses will spend on investment goods and whether consumers spend now or save for the future. For example, assume that you are considering how much to spend on your first house. Your decision will be affected by your *expectations* about your future income, family size, and future housing prices.

How do people form their expectations? According to the **rational-expectations hypothesis**, expectations are unbiased and based on all available information.

We pause for a statistical aside: A forecast is unbiased if it contains no systematic forecasting errors. Clearly, a forecast cannot always be perfectly accurate—you cannot foresee how a coin flip will come up on a single toss. However, you should not commit the statistical sin of *bias* by predicting that a fair coin will come up tails 25 percent of the time. You would be making an unbiased forecast if you predicted that the coin would come up tails 50 percent of the time or that each of the numbers on a die would, on average, come up one-sixth of the time.

People have **rational expectations** when, in addition to lacking bias, they use all available information in making their decisions. This implies that people understand how the economy works and what the government is doing. Thus, suppose that the government always boosts spending in election years to

promote its election prospects. Under rational expectations, people will anticipate this kind of behavior and act accordingly. (Recall that this principle is also an important assumption behind the efficient-market hypothesis of financial markets, as described in Chapter 23.)

### Real Business Cycles

The major application of modern classical macroeconomics is an exciting field known as **real-business-cycle (RBC) theory**. This theory was developed principally by Finn Kydland and Edward C. Prescott, who won the Nobel Prize for their work in this area. This approach holds that business cycles are primarily due to technological shocks and do not invoke any monetary or demand-side forces.

In the RBC approach, shocks to technology, investment, or the labor supply change the potential output of the economy. In other words, the shocks shift a *vertical AS* curve. These supply shocks are transmitted into actual output by the fluctuations of aggregate supply and are completely independent of *AD*. Similarly, movements in the unemployment rate are the result of movements in the natural rate of unemployment (the NAIRU) due either to microeconomic forces, such as the intensity of sectoral shocks, or to tax and regulatory policies. Standard Keynesian monetary and fiscal policies have no effect on output or employment in RBC models; they affect only *AD* and the price level. Figure 31-4 shows an example of a RBC recession caused by a decline in productivity.

### The Ricardian View of Fiscal Policy

One of the most influential criticisms of Keynesian macroeconomics was a new view of the role of fiscal policy. This view, known as the **Ricardian view of fiscal policy** and developed by Harvard University's Robert Barro, argues that changes in tax rates have no impact upon consumption spending.

This idea is a logical extension of the life-cycle model of consumption, introduced in Chapter 21. Under the Ricardian view, individuals are farsighted and form part of a succession of family members, like a dynasty. Parents care not only about their own consumption but also about the well-being of their children; the children, in turn, care about the well-being of their own children; and so on. This structure, called “dynastic preferences,” implies that the current generation’s horizon stretches into the

indefinite future through the overlapping concerns of each generation about its offspring.

Here is where the surprising result comes: If the government cuts taxes but leaves expenditures unchanged, this necessarily requires increased government borrowing. But, with unchanged expenditures, the government will have to raise taxes at some point in the future to pay the interest on its new borrowing. In the Ricardian view, consumers have rational expectations about future policies, so when a tax cut occurs, they know they must plan for a future tax increase. They will therefore increase their saving by the amount of the tax cut, and their consumption will remain unchanged. Moreover, people take into account the well-being of their children. So, even if the future tax increase comes after their lifetime, they will save enough to increase their bequests to their children so that their children can pay the extra taxes.

The net result in the Ricardian view is that tax changes have no impact upon consumption. Moreover, government debt is not net debt from the point of view of households because they offset these assets in their mental calculations with the present value of taxes that must be paid to service the government debt.

The Ricardian view of debt and deficits has stirred much controversy among macroeconomists. Critics point out that it requires that households be extremely farsighted, planning to give bequests to their children and constantly weighing their own interests against those of their descendants. The chain would be broken if there were no children, no bequests, no concern for children, or poor foresight. The empirical evidence to date provides little support for the Ricardian view, but it is a useful reminder of the logical limitations on fiscal policy.

### Efficiency Wages

Another important recent development, fusing elements of both classical and Keynesian economics, is called **efficiency-wage theory**. This approach was developed by Edmund Phelps (Columbia University), Joseph Stiglitz (Columbia University), and Janet Yellen (president of the Federal Reserve Bank of San Francisco). It explains the rigidity of real wages and the existence of involuntary unemployment in terms of firms' attempts to increase productivity by keeping wages above the market-clearing level. According to

this theory, higher wages lead to higher productivity because workers are healthier, because workers will have higher morale and be less likely to surf the Internet at work for fear of losing their jobs, because good workers are less likely to quit and look for new jobs, and because higher wages may attract better workers.

As firms raise their wages to increase worker productivity, job seekers may be willing to stand in line for these high-paying jobs, thereby producing involuntary unemployment. The innovation in this theory is that involuntary unemployment is an equilibrium feature and will not disappear over time.

### Supply-Side Economics

In the early 1980s, a group of economists and journalists developed a popular school known as **supply-side economics**, which emphasized incentives and tax cuts as a means of increasing economic growth. Supply-side economics was espoused forcefully by President Reagan in the United States (1981–1989) and by Prime Minister Thatcher in Great Britain (1979–1990).

Supply siders argued that Keynesians, in their excessive concern with the business cycle, had ignored the impact of tax rates and incentives on economic growth. According to supply siders, high taxes lead people to reduce their labor and capital supply. Indeed, supply-side economists like Arthur Laffer suggested that high tax rates might actually lower tax revenues. This *Laffer-curve* proposition holds that high tax rates shrink the tax base because they reduce economic activity. To fix what they view as an inefficient tax system, supply-side economists proposed a radical restructuring of the tax system, through an approach sometimes called “supply-side tax cuts.”

After occupying center stage during the 1980s, the supply-side theories largely waned after Ronald Reagan left office. In studying this period, economists have generally found that many of the supply-side assertions were not supported by economic experience. Supply-side tax cuts produced lower, not higher, revenues.

Many of the supply-side policies were revived in 2001, when President George W. Bush successfully negotiated another round of income-tax cuts. These cuts were rationalized not by the argument that they would raise revenues but, instead, by the theory that they would improve the efficiency of the tax system

and raise the long-run rate of economic growth. Like their precursor in 1981, these tax cuts led to lower, rather than higher, tax revenues (see Table 31-1).

## POLICY IMPLICATIONS

### Policy Ineffectiveness

The new classical approaches have several important implications for macroeconomic policy. One of the most important contentions is the *ineffectiveness of systematic fiscal and monetary policies in reducing unemployment*. The basic idea here is that a predictable attempt to stimulate the economy would be known in advance and would therefore have no effect on the economy.

For example, suppose that the government has always stimulated the economy whenever elections were approaching. After a couple of episodes of politically motivated fiscal policy, people would rationally come to expect that behavior. They might say to themselves:

Elections are coming. From experience I know that the government always pumps up the economy before elections. I will probably get an election-year tax cut, but that will be followed by a stealth tax increase next year. They can't fool me into consuming more, working harder, and voting for incumbents.

This is the **policy-ineffectiveness theorem** of classical macroeconomics. With rational expectations and flexible prices and wages, anticipated government policy cannot affect real output or unemployment.

### The Desirability of Fixed Rules

We described the monetarist case for fixed rules in Chapter 24. New classical macroeconomics puts this argument on firmer footing. This approach holds that an economic policy can be divided into two parts, a predictable part (the “rule”) and an unpredictable part (“discretion”).

New classical macroeconomists argue that discretion is a snare and a delusion. Policymakers, they contend, cannot forecast the economy any better than can the private sector. Therefore, by the time policymakers act on the news, flexibly moving prices in markets populated by well-informed buyers and sellers have already adapted to the news and reached their efficient supply-and-demand equilibrium. There are no further *discretionary* steps the government can take

to improve the outcome or prevent the unemployment that is caused by temporary misperceptions or real-business-cycle shocks.

Although they cannot make things better, government policies can definitely make things worse. The government can generate unpredictable discretionary policies that give misleading economic signals, confuse people, distort their economic behavior, and cause waste. According to new classical macroeconomists, governments should avoid any discretionary macroeconomic policies rather than risk producing such confusing “noise.”

### A New Synthesis?

After three decades of digesting the new classical approach to macroeconomics, elements of a synthesis of old and new theories are beginning to appear. Economists today emphasize the importance of expectations. A useful distinction is between the adaptive (or “backward-looking”) approach and the rational (or “forward-looking”) approach. The adaptive assumption holds that people form their expectations on the basis of past information; the forward-looking or rational approach was described above. The importance of forward-looking expectations is crucial to understanding behavior, particularly in competitive auction markets like those in the financial sector.

Some macroeconomists have begun to fuse the new classical view of expectations with the Keynesian view of product and labor markets. This synthesis is embodied in macroeconomic models that assume (1) labor and goods markets display inflexible wages and prices, (2) the prices in financial auction markets adjust rapidly to economic shocks and expectations, and (3) the expectations in auction markets are formed in a forward-looking way.

One important forecast of such new approaches is that forward-looking models tend to have large “jumps” or discontinuous changes in interest rates, stock prices, foreign exchange rates, and oil prices in reaction to major news. Sharp reactions are often seen after elections or when wars break out. For example, when the United States invaded Iraq in March 2003, oil prices declined by 35 percent and stock prices rose by 10 percent *in a single week*. The new classical prediction of “jumpy” prices replicates one realistic feature of auction markets and thus suggests one area where forward-looking expectations might be important in the real world.



The new classical approach to macroeconomics has brought many fruitful insights. Most important, it reminds us that the economy is populated by intelligent consumers and investors who react to and often anticipate policy. This reaction and counterreaction can actually change the way the economy behaves.

## C. STABILIZING THE ECONOMY

The period since World War II has been one of remarkable economic progress for the high-income market democracies. Average incomes and employment grew rapidly, international trade broadened and deepened, and many poor countries, notably India and China, began to close the gap with rich countries.

The economies performed so well that some proclaimed a “Great Moderation,” in which business cycles were disappearing. Some “new” economics textbooks virtually ignored the macroeconomics of business cycles.

This fantasy was dispelled with the financial crisis and deep recession that began in 2007. Words like “recession” and “depression”—which had been banished to the history books—again took on meaning in people’s daily lives.

It is critical to find policies which can help avoid the excesses of the business cycle. We have seen that the path of output and prices is determined by the interaction of aggregate supply and aggregate demand. *However, policies designed to stabilize the business cycle must operate primarily through their impact on aggregate demand.* The government can affect the growth of aggregate demand primarily through the use of its monetary and fiscal levers and thereby counter recessions.

These observations leave open two crucial questions: What is the best mix of monetary and fiscal policies for stabilizing the economy? Should there be tight rules on policy-making, or should policymakers be allowed great discretion in their actions?

## THE INTERACTION OF MONETARY AND FISCAL POLICIES

For large economies like the United States or Euroland, the best combination of monetary and fiscal policies will depend upon two factors: the need for demand management and the desired fiscal-monetary mix.

### Demand Management

The top consideration in business-cycle management is the overall state of the economy and the need to adjust aggregate demand. When the economy is stagnating, fiscal and monetary policies can be used to stimulate the economy and promote economic recovery. When inflation threatens, monetary and fiscal policies can help slow the economy and dampen inflationary fires. These are examples of *demand management*, which refers to the active use of monetary and fiscal policies to affect the level of aggregate demand.

Suppose, for example, that the economy is entering a severe recession. Output is low relative to its potential. What can the government do to revive the lagging economy? It can increase aggregate demand by raising money growth or by boosting government spending or both. After the economy has responded to the monetary and fiscal stimulus, output growth and employment will increase and unemployment will fall. (What steps could the government take during inflationary periods?)

Let’s review the relative strengths and weaknesses of monetary policy and fiscal policy.

**The Role of Fiscal Policy.** In the early stages of the Keynesian revolution, macroeconomists emphasized fiscal policy as the most powerful and balanced remedy for demand management. Critics of fiscal policy pointed to shortcomings stemming from timing, politics, and macroeconomic theory.

One concern is the time span between cyclical shock and policy response. It takes time to recognize that a cyclical turning point has been reached—the policy lag. For example, it took one year for the NBER to declare the latest business-cycle peak. (The December 2007 peak was not announced until December 2008.) After a turning point is identified, it takes time for the President to decide what policies are necessary and then still more time for the Congress to act. Finally, even when taxation or spending is changed, there is an effectiveness lag before the economy responds.

Critics also point out that it is easier to cut taxes than to raise them, and easier to raise spending than to cut it. During the 1960s, Congress was enthusiastic about passing the Kennedy-Johnson tax cuts. Two years later, when the Vietnam War expansion ignited inflationary pressures, contractionary policies were called for.



There are two situations when countercyclical fiscal policies appear to be particularly useful. One case is temporary tax cuts in recessions. Temporary tax cuts may be aimed primarily at low- and middle-income households. The reason is that these households have high marginal propensities to consume because they have little excess saving to fall back on in hard times. Statistical studies indicate that these measures have indeed been effective in increasing aggregate demand in the short run without leading to long-run fiscal deficits.

An even more important situation is when the economy is in a liquidity trap and the central bank has no further room to lower short-term interest rates. (Recall our discussion of the liquidity trap in Chapter 24.) This was the case during the 2007–2009 recession. In its effort to revive the economy, the Obama administration worked with Congress in early 2009 to pass the largest fiscal stimulus package in U.S. history. While some people worried about the long-term impact of the fiscal stimulus on the government debt, most macroeconomists believed that fiscal policy was the only feasible way to reduce the depth and the severity of the downturn in this circumstance.

**Effectiveness of Monetary Policy.** Compared to fiscal policy, monetary policy operates much more indirectly on the economy. Whereas an expansive fiscal policy actually buys goods and services or puts income into the hands of consumers and businesses, monetary policy affects spending by altering interest rates, credit conditions, exchange rates, and asset prices. In the early years of the Keynesian revolution, some macroeconomists were skeptical about the effectiveness of monetary policy—some said, “Monetary policy was like pushing on a string.” Over the last two decades, however, these concerns have been put to rest as the Federal Reserve has shown itself quite capable of slowing down, or speeding up, the economy.

The Federal Reserve is much better placed to conduct stabilization policy than are the fiscal-policy makers. Its staff of professional economists can recognize cyclical movements as well as anyone. And it can move quickly when the need arises. For example, a cascade of failures of financial institutions caused a major financial crisis when the investment-banking firm Bear, Stearns had severe liquidity problems on Friday, March 14, 2008. The Fed needed to come up with a solution before markets opened on Monday

morning. By Sunday, working with the U.S. Treasury Department, the Fed had engineered a takeover of Bear by J.P. Morgan and had opened an entire new credit facility for its primary dealers. It is difficult to conceive of any legislature taking such complex measures in such a short time.

A key ingredient in Fed policy is its independence, and the Fed has proved that it can stand the heat of making politically unpopular decisions when they are necessary to slow inflation. Most important is that—with some qualifications—from the point of view of demand management, monetary policy can do, or undo, anything that fiscal policy can accomplish. The major reservation is that if the economy gets stuck in a liquidity trap, with nominal interest rates at or near zero, then monetary policy loses its ability to stimulate the economy. When the economy is in or near a liquidity trap, fiscal policy must therefore take over the major expansionary role.

We can summarize the current state of fiscal and monetary policy as follows:

**Because of their political independence and rapid decision making, central banks are well placed to be on the front line of defense in stabilizing the economy against business-cycle shocks. Discretionary fiscal policy is useful in recessions as a one-time stimulus. When the economy approaches a liquidity trap, fiscal policy must be the primary source of economic stimulus.**

### **The Fiscal-Monetary Mix**

The second factor affecting fiscal and monetary policy is the desired **fiscal-monetary mix**, which refers to the relative strength of fiscal and monetary policies and their effect on different sectors of the economy. A *change in the fiscal-monetary mix* is an approach which tightens one policy while easing the other in such a way that aggregate demand and therefore total output remain constant. The basic idea is that fiscal policy and monetary policy are substitutes in demand management. But while alternative combinations of monetary and fiscal policies can be used to stabilize the economy, they have different impacts upon the *composition* of output. By varying the mix of taxes, government spending, and monetary policy, the government can change the fraction of GDP devoted to business investment, consumption, net exports, and government purchases of goods and services.

Sector		Change in output (\$, billion, 2008 prices)
<b>Investment sectors</b>		<b>132</b>
Gross private domestic investment		48
Housing	18	
Business fixed investment	30	
Net exports		83
<b>Consumption sectors</b>		<b>−106</b>
Government purchases of goods and services		−68
Personal consumption expenditures		−38
<b>Memoranda:</b>		
Change in real GDP		26
Change in federal deficit		−100

**TABLE 31-3. Changing the Fiscal-Monetary Mix**

What would be the impact of a change in the fiscal-monetary mix for the United States? This simulation assumes that the federal deficit is cut by \$100 billion through higher personal taxes and lower federal nondefense expenditures while the Federal Reserve uses monetary policy to keep unemployment on an unchanged trajectory. The simulation takes the average of the changes from the baseline path over the period 2000–2009.

Source: Simulation using the DRI model of the U.S. economy.

**Effect of Changing the Mix of Monetary and Fiscal Policies.** To understand the impact of changing the fiscal-monetary mix, let's examine a specific set of policies. Suppose that the federal government reduces the federal budget deficit by \$100 billion and that the Fed lowers interest rates to offset the contractionary impact of such a fiscal policy.

We can estimate the impact using a quantitative economic model. Table 31-3 shows the results of this experiment. Two interesting features emerge: First, the simulation indicates that a change in the fiscal-monetary mix would indeed change the composition of real GDP. While the deficit declines by \$100 billion, business investment goes up by \$30 billion. Investment in housing also increases as interest rates fall. At the same time, personal consumption declines, freeing up resources for investment. This simulation shows how a change in the fiscal-monetary mix might change the composition of output.

The simulation contains one particularly interesting result: Net exports rise far more than either housing or business fixed investment. This occurs because of the strong depreciation of the dollar which results from the lower interest rates. While this

result is clearly sensitive to the reaction of financial markets and exchange rates to the deficit-reduction package, it suggests that some of the popular analyses of the impact of such a package may be misleading. Many analysts have argued that a deficit-reduction package would have a significant impact upon domestic business investment and upon productivity. However, to the extent that lower deficits mainly increase net exports and housing, the nation is likely to experience relatively little increase in productivity growth. According to the estimates, cutting the budget deficit by \$100 billion will raise the growth rate of potential output from 2.3 percent per year to 2.5 percent per year over a 10-year period. Perhaps the small size of the payoff explains why it is so hard to muster the political will to cut the deficit.



#### Alternative Mixes in Practice

The fiscal-monetary mix has been sharply debated in American economic policy. Here are two major alternatives:

- **Loose fiscal—tight monetary policy.** Assume that the economy begins in an initial situation with low inflation

and output at its potential. A new president decides that it is necessary to increase defense spending sharply without raising taxes. By itself, this would increase the government deficit and increase aggregate demand. In this situation, the Federal Reserve would need to tighten monetary policy to prevent the economy from overheating. The result would be higher real interest rates and an appreciation of the dollar exchange rate. The higher interest rates would squeeze investment, while the appreciated dollar would reduce net exports. The net effect therefore would be that the higher defense spending would crowd out domestic investment and net exports. This policy was the one followed by the United States in the 1980s and again in the 2000s.

- **Tight fiscal—loose monetary policy.** Suppose that a country becomes concerned about a low national saving rate and desires to raise investment so as to increase the capital stock and boost the growth rate of potential output. To implement this approach, the country could raise consumption taxes and squeeze transfer payments so as to reduce disposable income and thereby lower consumption (tight fiscal policy). This would be accompanied by an expansionary monetary policy to lower interest rates and raise investment, lower the exchange rate, and expand net exports. This course would encourage private investment by increasing public saving. This was the economic philosophy of President Clinton which was embodied in the 1993 Budget Act and led to the budget surplus at decade's end.

## RULES VS. DISCRETION

We have seen that fiscal and monetary policy can *in principle* stabilize the economy. Many economists believe that countries should *in practice* take steps to shave the peaks and troughs off the business cycle. Other economists are skeptical of our ability to forecast cycles and take the right steps at the right time for the right reasons; this second group concludes that government cannot be trusted to make good economic policy, so its freedom to act should be strictly limited.

For example, fiscal conservatives worry that it's easier for Congress to increase spending and cut taxes than to do the reverse. That means it's easy to increase the budget deficit during recessions but much harder to turn around and shrink the deficit

again during booms, as a countercyclical fiscal policy would require. For that reason, conservatives have made several attempts to limit the ability of Congress to appropriate new funds or increase the deficit.

At the same time, monetary conservatives would like to tie the hands of central banks and force them to target inflation. Such a policy would eliminate the uncertainty about policy and enhance the credibility of the central bank as an inflation fighter.

At the most general level, the debate about “rules versus discretion” boils down to whether the advantages of flexibility in decision making are outweighed by the uncertainties and potential abuse in unconstrained decisions. Those who believe that the economy is inherently unstable and complex and that governments generally make wise decisions are comfortable with giving policymakers wide discretion to react aggressively to stabilize the economy. Those who believe that the government is the major destabilizing force in the economy and that policymakers are prone to selfishness and misjudgments favor tying the hands of the fiscal and monetary authorities.

### Budget Constraints on Legislatures?

As deficits began to grow during the 1980s, many people argued that Congress lacks the self-control to curb excessive spending and a burgeoning government debt. One proposal put forth by conservatives was a *constitutional amendment requiring a balanced budget*. Such an amendment was criticized by economists because it would make it difficult to use fiscal policy to fight recessions. To date, none of the proposed constitutional amendments has passed Congress.

Instead, Congress legislated a series of *budgetary rules to limit spending and tax reductions*. The first attempt was the Gramm-Rudman Act in 1985, which required that the deficit be reduced by a specified dollar amount each year and that the budget be balanced by 1991. This approach failed to limit spending and was abandoned.

A second approach was a *pay-as-you-go budget rule*, which was adopted in 1990. This required that Congress find the revenues to pay for any new spending program. In a sense, pay-as-you-go imposes a budget constraint on Congress, requiring that the costs of new programs be explicitly recognized either through higher taxes or through a reduction in other spending.

What was the impact of the budget constraints on Congress? Economic studies indicate that the

budget rules produced significant fiscal discipline, helped reduce the deficit over the 1990s, and eventually produced the surplus after 1998. However, when the deficit changed to surplus and the urgency of deficit-reduction declined, policymakers evaded the earlier budget caps with gimmicks like “emergency spending” for predictable items like the decennial census. Finally, in 2002, the budget caps were allowed to expire. Many economists believe that a pay-as-you-go rule is a useful mechanism to impose budget constraints on legislatures, and there were proposals to reinstate these in 2009.

### **Monetary Rules for the Fed?**

In our discussion of monetarism in Chapter 24, we laid out the case for fixed policy rules. The traditional argument for fixed rules is that the private economy is relatively stable and active policy-making is likely to destabilize rather than stabilize the economy. Moreover, to the extent that a central bank under the thumb of the government may be tempted to expand the economy before elections and to create a political business cycle, fixed rules will tie its hands. In addition, modern macroeconomists point to the value of being able to commit to action in advance. If the central bank can commit to follow a noninflationary rule, people’s expectations will adapt to this rule and inflationary expectations may be dampened.

One of the most important new developments in the last decade has been the trend toward inflation targeting in many countries. **Inflation targeting** is the announcement of official target ranges for the inflation rate along with an explicit statement that low and stable inflation is the overriding goal of monetary policy. Inflation targeting in hard or soft varieties has been adopted in recent years by many industrialized countries, including Canada, Britain, Australia, and New Zealand. Moreover, the treaty authorizing the new European Central Bank mandates that price stability be the ECB’s primary objective, although it is not formally required to target inflation. A number of economists and legislators are advocating this approach for the United States as well.

Inflation targeting involves the following:

- The government or central bank announces that monetary policy will strive to keep inflation near a numerically specified target.

- The target usually involves a range, such as 1 to 3 percent per year, rather than literal price stability. Generally, the government targets a core inflation rate, such as the CPI excluding volatile food and energy prices.
- Inflation is the primary or overriding target of policy in the medium run and long run. However, countries always make room for short-run stabilization objectives, particularly with respect to output, unemployment, financial stability, and the foreign exchange rate. These short-run objectives recognize that supply shocks can affect output and unemployment and that it may be desirable to have temporary departures from the inflation target to avoid excessive unemployment or output losses.

Proponents of inflation targeting point to many advantages. If there is no long-run tradeoff between unemployment and inflation, a sensible inflation target is that rate which maximizes the efficiency of the price system. Our analysis of inflation in Chapter 30 suggested that a low and stable rate of inflation would promote efficiency and minimize unnecessary redistribution of income and wealth. In addition, some economists believe that a strong and credible commitment to low and stable inflation will improve the short-run inflation-unemployment tradeoff. Finally, an explicit inflation target would increase the transparency of monetary policy.

Inflation targeting is a compromise between rule-based approaches and purely discretionary policies. The main disadvantage would come if the central bank began to rely too rigidly on the inflation rule and thereby allowed excessive unemployment in periods of severe supply shocks. Skeptics worry that the economy is too complex to be governed by fixed rules. Arguing by analogy, they ask whether one would advocate a fixed speed limit for cars or an automatic pilot for aircraft in all kinds of weather and emergencies.

Critics point to the financial crisis of 2007–2009 as an example of the peril of relying on rigid targets. The Fed lowered interest rates and expanded credit throughout this period, even though supply shocks were raising inflation above the Fed’s “comfort zone.” If the Fed had focused entirely on inflation under an inflation-targeting approach, it would have raised interest rates, tightened credit, and reinforced the recessionary tendencies and economic distress in

this period. Instead, the Fed concentrated on trying to cushion the economy from a deep recession and to prevent wholesale bankruptcies of financial institutions (see the discussion of Bear, Stearns above).

Monetary policy cannot banish all recessions or remove every temporary spike of inflation. However, working with fiscal policy, it can reduce the chance of spiraling contractions or hyperinflation.

The debate over rules versus discretion is one of the oldest debates of political economy. This dilemma reflects the difficult tradeoffs that democratic societies face in making decisions between short-run policies intended to attract political support and long-run policies designed to improve the general welfare. There is no single best approach for all times and places. For monetary policy, the United States has resolved the dilemma by creating an independent central bank, accountable to the legislature but given discretion to act forcefully when economic or financial crises arise.

D. ECONOMIC GROWTH AND HUMAN WELFARE

We have come to the end of our survey of modern macroeconomics. Let us step back and reflect on the central long-run message as stated by economist-journalist Paul Krugman:

Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its living standards over time depends almost entirely on its ability to raise its output per worker.

Promoting a high and growing standard of living for the nation's residents is one of the fundamental goals of macroeconomic policy. Because the current *level* of real income reflects the history of the *growth* of productivity, we can measure the relative success of past growth by examining the per capita GDPs of different countries. A short list is presented in Table 31-4. This table compares incomes by using *purchasing-power-parity* exchange rates that measure the purchasing power of (or quantity of goods and services that can be bought by) different national currencies. Evidently, the United States has been successful in its past growth performance. Perhaps

Country	Per capita GDP, 2006
United States	44,070
Hong Kong	39,200
United Kingdom	33,650
Japan	32,840
Germany	32,680
Slovenia	23,970
South Korea	22,990
Poland	14,250
Mexico	11,990
Botswana	11,730
Argentina	11,670
China	4,660
Nigeria	1,410
Congo	270

TABLE 31-4. Current Incomes Represent Effects of Past Growth

Those countries that have grown most rapidly in the past have reached the highest levels of per capita GDP today.

Source: World Bank.

the most worrisome issue in recent years is that the growth in living standards has not been universally shared around the world.

In discussions of growth rates, the numbers often seem tiny. A successful policy might increase a country's growth rate by only 1 percentage point per year (recall the estimated impact of the deficit-reduction package in the last section). But over long periods, this makes a big difference. Table 31-5 shows how tiny acorns grow into mighty oaks as small growth-rate differences cumulate and compound over time. A 4 percent-per-year growth difference leads to a 50-fold difference in income levels over a century.

How can public policy boost economic growth? As we emphasized in our chapters on economic growth, the growth of output per worker and of living standards depends upon a country's saving rate and upon its technological advance. Issues involving saving were discussed earlier in this chapter. Technological change includes not only new products and processes but also improvements in management as well as entrepreneurship and the spirit of enterprise—and we close our discussion with this topic.



Growth rate (% per year)	Real Income per Capita (constant prices)		
	2000	2050	2100
0	\$ 24,000	\$ 24,000	\$ 24,000
1	24,000	39,471	64,916
2	24,000	64,598	173,872
4	24,000	170,560	1,212,118

**TABLE 31-5. Small Differences in Growth Rates Compound into Large Income Differentials over the Decades**

## THE SPIRIT OF ENTERPRISE

Although investment is a central factor in economic growth, technological advance is perhaps even more important. If we took the workers in 1900 and doubled or tripled their capital in mules, saddles, picks, and cow paths, their productivity still could not come close to that of today's workers using huge tractors, superhighways, and supercomputers.

### Fostering Technological Advance

While it is easy to see how technological advance promotes growth in productivity and living standards, governments cannot simply command people to think harder or be smarter. Centrally planned socialist countries used “sticks” to promote science, technology, and innovation, but their efforts failed because neither the institutions nor the “carrots” were present to encourage both innovation and introduction of new technologies. Governments often promote rapid technological change best when they set a sound economic and legal framework with strong intellectual property rights and then allow great economic freedom within that framework. *Free markets in labor, capital, products, and ideas have proved to be the most fertile soil for innovation and technological change.*

Within the framework of free markets, governments can foster rapid technological change both by encouraging new ideas and by ensuring that technologies are effectively used. Policies can focus on both the supply side and the demand side.

**Promoting Demand for Better Technologies.** The world is full of superior technologies that have not been adopted; otherwise, how could we explain the

vast differences in productivity shown in Table 31-4? In considering technology policies, therefore, governments must ensure that firms and industries move toward the *technological frontier*, adopting the best-practice technology available in the global marketplace.

The major lesson here is that “necessity is the mother of invention.” In other words, vigorous competition among firms and industries is the ultimate discipline that ensures innovation. Just as athletes perform better when they are trying to outrun their competitors, so are firms spurred to improve their products and processes when the victors are given fame and fortune while the laggards may go bankrupt.

Vigorous competition involves both domestic and foreign competitors. For large countries on the technological frontier, domestic competition is necessary to promote innovation. The movement to deregulation over the last three decades has brought competition to airlines, energy, telecommunications, and finance, and the positive impact on innovation has been dramatic. For small or technologically backward countries, import competition is crucial to adopting advanced technologies and ensuring product market competition.

**Promoting Supply of New Technologies.** Rapid economic growth requires pushing out the technological frontier by increasing the supply of inventions as well as ensuring that there is adequate demand for existing advanced technologies. There are three ways by which governments can encourage the supply of new technologies.

First, governments can ensure that the basic science, engineering, and technology are appropriately supported. In this respect, the world leader in the



last half-century has been the United States, which combines company support for applied research with top-notch university basic research generously supported by government funding. Particularly outstanding have been the impressive improvements in biomedical technology in the form of new drugs and equipment that benefit consumers directly in daily life. The government's role in supporting for-profit research is accomplished by a strong patent system, predictable and cost-effective regulations, and fiscal incentives such as the current R&D tax credit.

Second, governments can advance technologies at home through encouraging investment by foreign firms. As foreign countries reach and pass the American technological frontier, they can also contribute to American know-how by establishing operations in the United States. The last two decades have brought a number of Japanese automakers to the United States, and Japanese-owned plants have introduced new technologies and managerial practices to the benefit of both the profits of Japanese shareholders and the productivity of American workers.

Third, governments can promote new technologies by pursuing sound macroeconomic policies. These include low and stable taxes on capital income and a low cost of capital to firms. Indeed, the importance of the cost of capital brings us back full circle to the issue of the low saving rate and high real interest rate. American firms are sometimes accused of being myopic and being unwilling to invest for the long run. At least part of this myopia comes from being faced with high real interest rates—high real interest rates *force* rational American firms to look for quick payoffs in their investments. A change in economic policy that lowered real interest rates would change

the “economic spectacles” through which firms look when considering their technological policies. If real interest rates were lower, firms would view long-term, high-risk projects such as investments in technology more favorably, and the increased investment in knowledge would lead to more rapid improvements in technology and productivity.



### Valediction on Economic Growth

Following the Keynesian revolution, the leaders of the market democracies believed that they could flourish and grow rapidly.

By using the tools of modern economics, countries could moderate the extremes of unemployment and inflation, poverty and wealth, privilege and deprivation. Indeed, many of these goals were achieved as the market economies experienced a period of output expansion and employment growth never seen before.

At the same time, Marxists carped that capitalism was doomed to crash in a cataclysmic depression; ecologists fretted that market economies would choke on their own fumes; and libertarians worried that government planning was leading us down the road to serfdom. But the pessimists overlooked the spirit of enterprise, which was nurtured by an open society and free markets and which led to a continuous stream of technological improvements.

A valediction from John Maynard Keynes, as timely today as it was in an earlier age, provides a fitting summary of our survey of modern economics:

It is Enterprise which builds and improves the world's possessions. If Enterprise is afoot, wealth accumulates whatever happens to Thrift; and if Enterprise is asleep, wealth decays whatever Thrift may be doing.



## SUMMARY

### A. The Economic Consequences of the Government Debt

1. Budgets are systems used by governments and organizations to plan and control expenditures and revenues. Budgets are in surplus (or deficit) when the government has revenues greater (or less) than its expenditures. Macroeconomic policy depends upon fiscal policy, which comprises the overall stance of spending and taxes.
2. Economists separate the actual budget into its structural and cyclical components. The structural budget calculates how much the government would collect

and spend if the economy were operating at potential output. The cyclical budget accounts for the impact of the business cycle on tax revenues, expenditures, and the deficit. To assess fiscal policy, we should pay close attention to the structural deficit; changes in the cyclical deficit are a *result* of changes in the economy, while structural deficits are a *cause* of changes in the economy.

3. The government debt represents the accumulated borrowings from the public. It is the sum of past deficits. A useful measure of the size of the debt is the debt-GDP ratio, which for the United States has tended to rise during wartime and fall during peacetime.
4. In understanding the impact of government deficits and debt, it is crucial to distinguish between the short run and the long run. Review the box on page 638 and make sure you understand why a larger deficit can increase output in the short run while decreasing output in the long run.
5. To the degree that we borrow from abroad for consumption and pledge posterity to pay back the interest and principal on such external debt, our descendants will indeed find themselves sacrificing consumption to service this debt. If we leave future generations an internal debt but no change in capital stock, there are various internal effects. The process of taxing Peter to pay Paula, or taxing Paula to pay Paula, can involve various microeconomic distortions of productivity and efficiency but should not be confused with owing money to another country.
6. Economic growth may slow if the public debt displaces capital. This syndrome occurs when people substitute public debt for capital or private assets, thereby reducing the economy's private capital stock. In the long run, a larger government debt may slow the growth of potential output and consumption because of the costs of servicing an external debt, the inefficiencies that arise from taxing to pay the interest on the debt, and the diminished capital accumulation that comes from capital displacement.

## B. Advances in Modern Macroeconomics

7. Classical economists relied upon Say's Law of Markets, which holds that "supply creates its own demand." In modern language, the classical approach means that flexible wages and prices quickly remove any excess supply or demand and thereby reestablish full employment. In a classical system, macroeconomic policy has no role to play in stabilizing the real economy, although it will still affect the path of prices.
8. New classical macroeconomics holds that expectations are rational, prices and wages are flexible,

and unemployment is largely voluntary. The policy-ineffectiveness theorem holds that predictable government policies cannot affect real output and unemployment. The theory of the real business cycle points to supply-side technological disturbances and to labor market shifts as the clues to business-cycle fluctuations.

9. What is our appraisal of the contribution of the new classical approach to short-run macroeconomics? The new classical approach properly insists that the economy is populated by forward-looking consumers and investors. These economic actors react to and often anticipate policy and can thereby change economic behavior. This lesson is particularly important in financial markets, where reactions and anticipations often have dramatic effects.

## C. Stabilizing the Economy

10. Nations face two considerations in setting monetary and fiscal policies: the appropriate level of aggregate demand and the best monetary-fiscal mix. The mix of fiscal and monetary policies helps determine the composition of GDP. A high-investment strategy would call for a budget surplus along with low real interest rates.
11. Should governments follow fixed rules or discretion? The answer involves both positive economics and normative values. Conservatives often espouse rules, while liberals often advocate active fine-tuning to attain economic goals. More basic is the question of whether active and discretionary policies stabilize or destabilize the economy. Economists often stress the need for *credible* policies, whether credibility is generated by rigid rules or by wise leadership. A recent trend among countries is inflation targeting for monetary policy, which is a flexible rule-based system that sets a medium-term inflation target while allowing short-run flexibility when economic shocks make attaining a rigid inflation target too costly.

## D. Economic Growth and Human Welfare

12. Remember the dictum: "Productivity isn't everything, but in the long run it is almost everything." A country's ability to improve its living standards over time depends almost entirely on its ability to improve the technologies and capital used by the workforce.
13. Promoting economic growth entails advancing technology. The major role of government is to ensure free markets, protect strong intellectual property rights, promote vigorous competition, and support basic science and technology.

## CONCEPTS FOR REVIEW

### The Economics of Debt and Deficits

government budget  
 budget deficit, surplus, and balance  
 budget:  
   actual  
   structural  
   cyclical  
 short-run impact of  $G$  and  $T$  on output  
 long-run impacts on economic growth:  
   internal vs. external debt  
   distortions from taxation  
   displacement of capital

### Advances in Modern Macroeconomics

Say's Law of Markets  
 rational (forward-looking)  
   expectations, adaptive (backward-  
   looking) expectations  
 policy-ineffectiveness theorem  
 real business cycle, efficiency wages  
 Ricardian view of fiscal policy

### Stabilization

demand management  
 fiscal-monetary mix

fixed rules vs. discretion  
 inflation targeting

### Long-Run Growth

reaching the technological frontier vs.  
 moving it outward  
 Keynes's spirit of enterprise

## FURTHER READING AND INTERNET WEBSITES

### Further Reading

The Krugman quotation is from Paul Krugman, *The Age of Diminished Expectations* (MIT Press, Cambridge, Mass., 1990), p. 9. Many of the foundations of new classical economics were developed by Robert Lucas and republished in *Studies in Business-Cycle Theory* (MIT Press, Cambridge, Mass., 1990). Modern efficiency-wage theory is presented in Edmund Phelps, *Structural Slumps: The Modern Equilibrium Theory of Unemployment, Interest, and Assets* (Harvard University Press, Cambridge, Mass., 1994).

A nontechnical review of the different schools of macroeconomics is provided by Paul Krugman, *Peddling Prosperity: Economic Sense and Nonsense in the Age of Diminished Expectations* (Norton, New York, 1994).

### Websites

Economic issues and data on fiscal policy, budgets, and the debt are regularly provided by the nonpartisan Congressional Budget Office, which is staffed by professional economists. Recent documents are available at [www.cbo.gov](http://www.cbo.gov).

A survey of issues involved in inflation targeting can be found in a 2003 speech by Fed chair Ben Bernanke, "A Perspective on Inflation Targeting," at [www.federalreserve.gov/Boarddocs/Speeches/2003/20030325/default.htm](http://www.federalreserve.gov/Boarddocs/Speeches/2003/20030325/default.htm). Real-business-cycle theory has its own website at [dqe.repec.org/index.html](http://dqe.repec.org/index.html).

## QUESTIONS FOR DISCUSSION

1. A common confusion is that between the debt and the deficit. Explain each of the following:
  - a. A budget deficit leads to a growing government debt.
  - b. Reducing the deficit does not reduce the government debt.
  - c. Reducing the government debt requires running a budget surplus.
  - d. Even though the government deficit was reduced in the 1993–1998 period, the government debt still rose in these years.
2. Is it possible that government *promises* might have a displacement effect along with government debt? Thus, if the government were to promise large future social security benefits to workers, would workers feel richer? Might they reduce saving as a result? Could