9

The Government and Fiscal Policy

CHAPTER OUTLINE AND LEARNING OBJECTIVES

There is considerable debate over what the government can and should do in managing the macroeconomy. At one end of the spectrum are the Keynesians and their intellectual descendants who believe that the macroeconomy is likely to fluctuate too much if left on its own and that the government should smooth out fluctuations in the business cycle. These ideas can be traced to Keynes's analysis in *The General Theory*, which suggests that governments can use their taxing and spending powers to increase aggregate expenditure (and thereby stimulate aggregate output) in recessions or depressions. At the other end of the spectrum are those who claim that government spending is incapable of stabilizing the economy, or worse, is destabilizing and harmful. In this chapter, we turn to this set of questions.

The government has a variety of powers—including regulating firms' entry into and exit from an industry, setting standards for product quality, setting minimum wage levels, and regulating the disclosure of information—but in macroeconomics, we focus on two policy instruments: fiscal policy and monetary policy. **Fiscal policy**, the focus of this chapter, refers to the government's spending and taxing behavior—in other words, its budget policy. (The word *fiscal* comes from the root *fisc*, which refers to the "treasury" of a government.) Fiscal policy is generally divided into three categories: (1) policies concerning government purchases of goods and services, (2) policies concerning taxes, and (3) policies concerning transfer payments (such as unemployment compensation, Social Security benefits, welfare payments, and

veterans' benefits) to households. **Monetary policy**, which we consider in the next chapter, refers to the behavior of the nation's central bank, the Federal Reserve, with respect to the interest rate.

fiscal policy The government's spending and taxing policies.

Government in the Economy

9.1 LEARNING OBJECTIVE

Discuss the influence of fiscal policies on the economy.

Local, state, and federal governments have in some areas considerable control. In many cases, however, the *effect* of government decisions on the economy depends not only on the decision itself, but also on the state of the economy. It is important to understand the limits of government control as well as its power. Taxes provide a good example. Tax rates are controlled by the government. By law, Congress has the authority to decide who and what should be taxed and at what rate. Tax *revenue*, on the other hand, is not subject to complete control by the government. Revenue from the personal income tax system depends on personal tax rates (which Congress sets) *and* on the income of the household sector (which depends on many factors not under direct government control, such as how much households decide to work). Revenue from the corporate profits tax depends on both corporate profits tax rates and the size of corporate profits. The government controls corporate tax rates, but not the size of corporate profits.

monetary policy The tools used by the Federal Reserve to control the short-term interest rate.

Some government spending also depends on government decisions and on the state of the economy. In the United States, the unemployment insurance program pays benefits to unemployed people. When the economy goes into a recession, the number of unemployed workers increases and so does the level of government unemployment insurance payments. This occurs not because of a change in government decisions, but because of the interaction between existing policies and the economy itself.

Taxes and spending often go up or down in response to changes in the economy instead of as the result of deliberate decisions by policy makers. As such we will occasionally use **discretionary fiscal policy** to refer to changes in taxes or spending that are the result of deliberate changes in government policy.

discretionary fiscal policy Changes in taxes or spending that are the result of deliberate changes in government policy.

Government Purchases (G), Net Taxes (T), and Disposable Income (Y_d) MyLab Economics Concept Check

We now add the government to the simple economy in Chapter 6. To keep things simple, we will combine two government activities—the collection of taxes and the payment of transfer payments—into a category we call **net taxes (T)**. Specifically, net taxes are equal to the tax payments made to the government by firms and households minus transfer payments made to households by the government. The other variable we will consider is government purchases of goods and services (G).

net taxes (T) Taxes paid by firms and households to the government minus transfer payments made to households by the government.

Our previous discussions of household consumption did not take taxes into account. We assumed that all the income generated in the economy was spent or saved by households. When we take into account the role of government, as Figure 9.1 does, we see that as income (Y) flows toward households, the government takes income from households in the form of net taxes (T). The income that ultimately gets to households is called **disposable, *or* after-tax, income (Y_d)**:

disposable, *or* after-tax, income (Y_d) Total income minus net taxes: $Y - T$.

$$\text{disposable income} \equiv \text{total income} - \text{net taxes}$$

$$Y_d \equiv Y - T$$

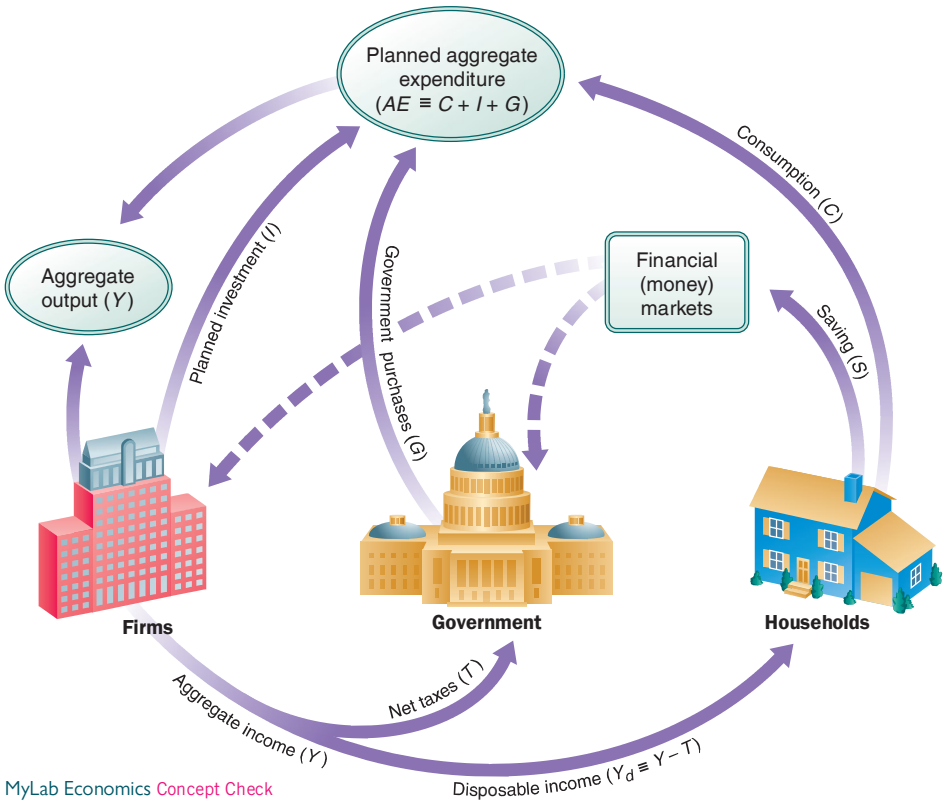
Y_d excludes taxes paid by households and includes transfer payments made to households by the government. For now, we are assuming that T does not depend on Y—that is, net taxes do not depend on income. This assumption is relaxed in Appendix B to this chapter. Taxes that do not depend on income are sometimes called *lump-sum taxes*.

As Figure 9.1 shows, the disposable income (Y_d) of households must end up as either consumption (C) or saving (S). Thus,

$$Y_d \equiv C + S$$

This equation is an identity—something that is always true.

FIGURE 9.1 Adding Net Taxes (*T*) and Government Purchases (*G*) to the Circular Flow of Income



MyLab Economics Concept Check

Because disposable income is aggregate income (Y) minus net taxes (T), we can write another identity:

$$Y - T \equiv C + S$$

By adding T to both sides:

$$Y \equiv C + S + T$$

This identity says that aggregate income gets cut into three pieces. Government takes a slice (net taxes, T), and then households divide the rest between consumption (C) and saving (S).

We need to expand our definition of planned aggregate expenditure because governments spend money on goods and services,. Planned aggregate expenditure (AE) is the sum of consumption spending by households (C), planned investment by business firms (I), *and* government purchases of goods and services (G).

$$AE \equiv C + I + G$$

budget deficit The difference between what a government spends and what it collects in taxes in a given period: $G - T$.

A government's **budget deficit** is the difference between what it spends (G) and what it collects in taxes (T) in a given period:

$$\text{budget deficit} \equiv G - T$$

If G exceeds T, the government must borrow from the public to finance the deficit. It does so by selling Treasury bonds and bills (more on this later). In this case, a part of household saving (S) goes to the government. The dashed lines in Figure 9.1 mean that some household saving goes to firms to finance investment projects and some goes to the government to finance its deficit. If G is less than T, which means that the government is spending less than it is collecting in taxes, the government is running a *surplus*. In this case it is retiring debt.

Adding Taxes to the Consumption Function In Chapter 8, we assumed that aggregate consumption (C) depends on aggregate income (Y), and for the sake of illustration, we used a specific linear consumption function:

$$C = a + bY$$

where b is the marginal propensity to consume. We need to modify this consumption function because we have added government to the economy. With taxes a part of the picture, it makes sense to assume that disposable income (Y_d), instead of before-tax income (Y), determines consumption behavior. If you earn a million dollars, but have to pay $950,000 in taxes, you have no more disposable income than someone who earns only $50,000, but pays no taxes. What you have available for spending on current consumption is your disposable income, not your before-tax income.

To modify our aggregate consumption function to incorporate disposable income instead of before-tax income, instead of $C = a + bY$, we write

$$C = a + bY_d$$

or

$$C = a + b(Y - T)$$

Our consumption function now has consumption depending on disposable income instead of before-tax income.

Planned Investment What about planned investment? The government can affect investment behavior through its tax treatment of depreciation and other tax policies. Also, planned investment depends on the interest rate, as discussed in the previous chapter. For purposes of this chapter, we continue to assume that the interest rate is fixed. We will ignore any tax effects on planned investment and thus continue to assume that it is fixed (because the interest rate is fixed).

The Determination of Equilibrium Output (Income) MyLab Economics Concept Check

We know from Chapter 8 that equilibrium occurs where $Y = AE$ —that is, where aggregate output equals planned aggregate expenditure. Remember that planned aggregate expenditure in an economy with a government is $AE \equiv C + I + G$, so equilibrium is

$$Y = C + I + G$$

The equilibrium analysis in Chapter 8 applies here also. If output (Y) exceeds planned aggregate expenditure ($C + I + G$), there will be an unplanned increase in inventories—actual investment will exceed planned investment. Conversely, if $C + I + G$ exceeds Y, there will be an unplanned decrease in inventories.

An example will illustrate the government's effect on the macroeconomy and the equilibrium condition. First, our consumption function, $C = 100 + 0.75Y$ before we introduced the government sector, now becomes

$$C = 100 + 0.75Y_d$$

or

$$C = 100 + 0.75(Y - T)$$

Second, we assume that G is 100 and T is 100.[1] In other words, the government is running a balanced budget, financing all of its spending with taxes. Third, we assume that planned investment (I) is 100.

[1] As we pointed out previously, the government does not have complete control over tax revenues and transfer payments. We ignore this problem here, however, and set T, tax revenues minus transfers, at a fixed amount. Things will become more realistic later in this chapter and in Appendix B.

TABLE 9.1 Finding Equilibrium for $I = 100$, $G = 100$, and $T = 100$

(1) Output (Income) Y	(2) Net Taxes T	(3) Disposable Income $Y_d \equiv Y - T$	(4) Consumption Spending $C = 100 + 0.75\,Y_d$	(5) Saving S $Y_d - C$	(6) Planned Investment Spending I	(7) Government Purchases G	(8) Planned Aggregate Expenditure $C + I + G$	(9) Unplanned Inventory Change $Y - (C + I + G)$	(10) Adjustment to Disequilibrium
300	100	200	250	−50	100	100	450	−150	Output ↑
500	100	400	400	0	100	100	600	−100	Output ↑
700	100	600	550	50	100	100	750	−50	Output ↑
900	**100**	**800**	**700**	**100**	**100**	**100**	**900**	**0**	**Equilibrium**
1,100	100	1,000	850	150	100	100	1,050	+50	Output ↓
1,300	100	1,200	1,000	200	100	100	1,200	+100	Output ↓
1,500	100	1,400	1,150	250	100	100	1,350	+150	Output ↓

Table 9.1 calculates planned aggregate expenditure at several levels of disposable income. For example, at $Y = 500$, disposable income is $Y - T$, or 400. Therefore, $C = 100 + 0.75(400) = 400$. Assuming that I is fixed at 100 and assuming that G is fixed at 100, planned aggregate expenditure is 600 ($C + I + G = 400 + 100 + 100$). Because output ($Y$) is only 500, planned spending is greater than output by 100. As a result, there is an unplanned inventory decrease of 100, giving firms an incentive to raise output. Thus, output of 500 is below equilibrium.

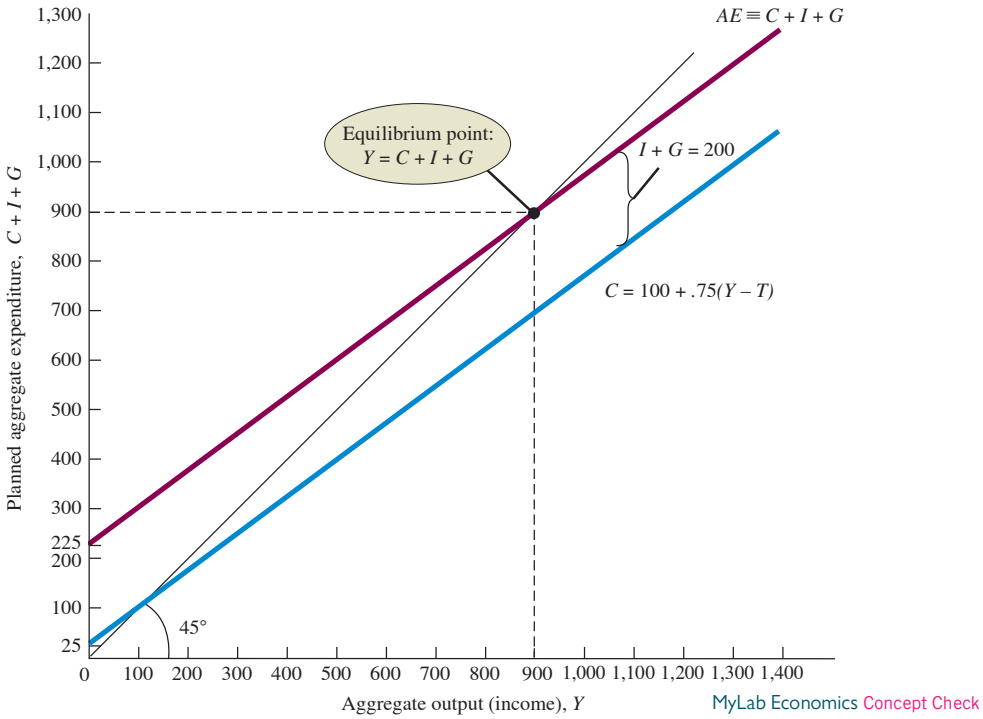
If $Y = 1{,}300$, then $Y_d = 1{,}200$, $C = 1{,}000$, and planned aggregate expenditure is 1,200. Here planned spending is *less* than output, there will be an unplanned inventory increase of 100, and firms have an incentive to cut back output. Thus, output of 1,300 is above equilibrium. Only when output is 900 are output and planned aggregate expenditure equal, and only at $Y = 900$ does equilibrium exist.

In Figure 9.2, we derive the same equilibrium level of output graphically. First, the consumption function is drawn, taking into account net taxes of 100. The old function was $C = 100 + 0.75Y$. The new function is $C = 100 + 0.75\,(Y - T)$ or $C = 100 + 0.75(Y - 100)$, rewritten as $C = 100 + 0.75Y - 75$, or $C = 25 + 0.75Y$. For example, consumption at an income of zero is 25 ($C = 25 + 0.75Y = 25 + 0.75(0) = 25$). The marginal propensity to consume has not changed—we assume that it remains 0.75. Note that the consumption function in Figure 9.2 plots the points in columns (1) and (4) of Table 9.1.

Planned aggregate expenditure, recall, adds planned investment to consumption. Now in addition to 100 in investment, we have government purchases of 100. I and G are constant at 100 each at all levels of income, so we add $I + G = 200$ to consumption at every level of income. The result is the new AE curve. This curve is just a plot of the points in columns (1) and (8) of Table 9.1. The 45-degree line helps us find the equilibrium level of real output, which, we already know, is 900. If you examine any level of output above or below 900, you will find disequilibrium. At $Y = 500$, for example, people want to consume 400, which with planned investment of 100 and government purchases of 100, gives planned aggregate expenditure of 600. Output is, however, only 500. Inventories will fall below what was planned, and firms will have an incentive to increase output.

The Saving/Investment Approach to Equilibrium As in the last chapter, we can also examine equilibrium using the saving/investment approach. Look at the circular flow of income in Figure 9.1. The government takes out net taxes (T) from the flow of income—a leakage—and households save (S) some of their income—also a leakage from the flow of income. The planned spending injections are government purchases (G) and planned investment (I). If leakages ($S + T$) equal planned injections ($I + G$), there is equilibrium:

saving/investment approach to equilibrium: $S + T = I + G$



MyLab Economics Concept Check

FIGURE 9.2 Finding Equilibrium Output/Income Graphically
Because G and I are both fixed at 100, the aggregate expenditure function is the new consumption function displaced upward by $I + G = 200$. Equilibrium occurs at $Y = C + I + G = 900$.

To derive this, we know that in equilibrium, aggregate output (income) (Y) equals planned aggregate expenditure (AE). By definition, AE equals $C + I + G$, and by definition, Y equals $C + S + T$. Therefore, at equilibrium

$$C + S + T = C + I + G$$

Subtracting C from both sides leaves:

$$S + T = I + G$$

Note that equilibrium does *not* require that $G = T$ (a balanced government budget) or that $S = I$. It is only necessary that the sum of S and T equals the sum of I and G.

Column (5) of Table 9.1 calculates aggregate saving by subtracting consumption from disposal income at every level of disposable income($S \equiv Y_d - C$). I and G are fixed, so $I + G$ equals 200 at every level of income. Using the table to add saving and taxes ($S + T$), we see that $S + T$ equals 200 only at $Y = 900$. Thus, the equilibrium level of output (income) is 900, the same answer we arrived at through numerical and graphic analysis.

Fiscal Policy at Work: Multiplier Effects

9.2 LEARNING OBJECTIVE
Describe the effects of three fiscal policy multipliers.

You can see from Figure 9.2 that if the government were able to change the levels of either G or T, it would be able to change the equilibrium level of output (income). At this point, we are assuming that the government controls G and T. In this section, we will review three multipliers:

- Government spending multiplier
- Tax multiplier
- Balanced-budget multiplier

The Government Spending Multiplier MyLab Economics Concept Check

Suppose you are the chief economic adviser to the president and the economy is sitting at the equilibrium output pictured in Figure 9.2. Output and income are 900, and the government is currently buying 100 worth of goods and services each year and is financing them with 100 in taxes. The budget is balanced. In addition, firms are investing (producing capital goods) 100. The

president calls you into the Oval Office and says, "Unemployment is too high. We need to lower unemployment by increasing output and income." After some research, you determine that an acceptable unemployment rate can be achieved only if aggregate output increases to 1,100.

You now need to determine how the government can use taxing and spending policy—fiscal policy—to increase the equilibrium level of national output by 200. Suppose the president has let it be known that taxes must remain at present levels—Congress just passed a major tax reform package—so adjusting T is out of the question for several years. That leaves you with G. Your only option is to increase government spending while holding taxes constant.

To increase spending without raising taxes (which provides the government with revenue to spend), the government must borrow. When G is bigger than T, the government runs a deficit and the difference between G and T must be borrowed. For the moment, we will ignore the possible effect of the deficit and focus only on the effect of a higher G with T constant.

Meanwhile, the president is awaiting your answer. How much of an increase in spending would be required to generate an increase of 200 in the equilibrium level of output, pushing it from 900 to 1,100 and reducing unemployment to the president's acceptable level? You might be tempted to say that because we need to increase income by 200 (1,100 − 900), we should increase government spending by the same amount, but what will happen if we raise G by 200? The increased government spending will throw the economy out of equilibrium because G is a component of aggregate spending, planned aggregate expenditure will increase by 200. Planned spending will be greater than output, inventories will be lower than planned, and firms will have an incentive to increase output. Suppose output rises by the desired 200. You might think, "We increased spending by 200 and output by 200, so equilibrium is restored."

There is more to the story than this. The moment output rises, the economy is generating more income. This was the desired effect: the creation of more employment. The newly employed workers are also consumers, and some of their income gets spent. With higher consumption spending, planned spending will be greater than output, inventories will be lower than planned, and firms will raise output (and thus raise income) again. This time firms are responding to the new consumption spending. Already, total income is over 1,100.

This story should sound familiar. It is the multiplier in action. Although this time it is government spending (G) that is changed rather than planned investment (I), the effect is the same as the multiplier effect we described in Chapter 8. An increase in government spending has the same impact on the equilibrium level of output and income as an increase in planned investment. A dollar of extra spending from either G or I is identical with respect to its impact on equilibrium output. The equation for the government spending multiplier is the same as the equation for the multiplier for a change in planned investment.

$$\text{government spending multiplier} \equiv \frac{1}{\text{MPS}} \equiv \frac{1}{1 - \text{MPC}}$$

We derive the government spending multiplier algebraically in Appendix A to this chapter.

government spending multiplier The ratio of the change in the equilibrium level of output to a change in government spending.

Formally, the **government spending multiplier** is defined as the ratio of the change in the equilibrium level of output to a change in government spending. This is the same definition we used in the previous chapter, but now the exogenous variable is government spending instead of planned investment.

Remember that we were thinking of increasing government spending (G) by 200. We can use the multiplier analysis to see what the new equilibrium level of Y would be for an increase in G of 200. The multiplier in our example is 4. (Because b—the MPC—is .75, the MPS must be $1 - 0.75 = 0.25$; and $1/0.25 = 4$.) Thus, Y will increase by 800 (4×200). Because the initial level of Y was 900, the new equilibrium level of Y is $900 + 800 = 1{,}700$ when G is increased by 200.

The level of 1,700 is much larger than the level of 1,100 that we calculated as being necessary to lower unemployment to the desired level. Let us back up then. If we want Y to increase by 200 and if the multiplier is 4, we need G to increase by only $200/4 = 50$. If G increases by 50, the equilibrium level of Y will change by 200 and the new value of Y will be 1,100 (900 + 200), as desired.

Looking at Table 9.2, we can check our answer to make sure it is an equilibrium. Look first at the old equilibrium of 900. When government purchases (G) were 100, aggregate output (income) was equal to planned aggregate expenditure ($AE \equiv C + I + G$) at $Y = 900$.

TABLE 9.2 Finding Equilibrium after a Government Spending Increase of 50*

(1) Output (Income) Y	(2) Net Taxes T	(3) Disposable Income $Y_d \equiv Y - T$	(4) Consumption Spending $C = 100 + .75\,Y_d$	(5) Saving S $Y_d - C$	(6) Planned Investment Spending I	(7) Government Purchases G	(8) Planned Aggregate Expenditure $C + I + G$	(9) Unplanned Inventory Change $Y - (C + I + G)$	(10) Adjustment to Disequilibrium
300	100	200	250	−50	100	150	500	−200	Output ↑
500	100	400	400	0	100	150	650	−150	Output ↑
700	100	600	550	50	100	150	800	−100	Output ↑
900	100	800	700	100	100	150	950	−50	Output ↑
1,100	**100**	**1,000**	**850**	**150**	**100**	**150**	**1,100**	**0**	**Equilibrium**
1,300	100	1,200	1,000	200	100	150	1,250	+50	Output ↓

*G has increased from 100 in Table 9.1 to 150 here.

Now G has increased to 150. At $Y = 900$, $(C + I + G)$is greater than Y, there is an unplanned fall in inventories, and output will rise, but by how much? The multiplier told us that equilibrium income would rise by four times the 50 change in G. Y should rise by $4 \times 50 = 200$, from 900 to 1,100, before equilibrium is restored. Let us check. If $Y = 1{,}100$, consumption is $C = 100 + 0.75Y_d = 100 + 0.75(1{,}000) = 850$. Because I equals 100 and G now equals 100 (the original level of G) + 50 (the additional G brought about by the fiscal policy change) = 150, $C + I + G = 850 + 100 + 150 = 1{,}100$. $Y = AE$, and the economy is in equilibrium.

The graphic solution to the president's problem is presented in Figure 9.3. An increase of 50 in G shifts the planned aggregate expenditure function up by 50. The new equilibrium income occurs where the new AE line (AE_2) crosses the 45-degree line, at $Y = 1{,}100$.

Make sure you understand the economics underlying the numerical analysis here. When the government injects money into the economy through new purchases of goods and services, those new purchases create income for newly hired workers. That income stimulates the newly hired workers to spend more, which in turn stimulates the economy more, providing further new jobs and more income. The final result is that the stimulus effect is multiplied and the economy increases by more than the original government spending.

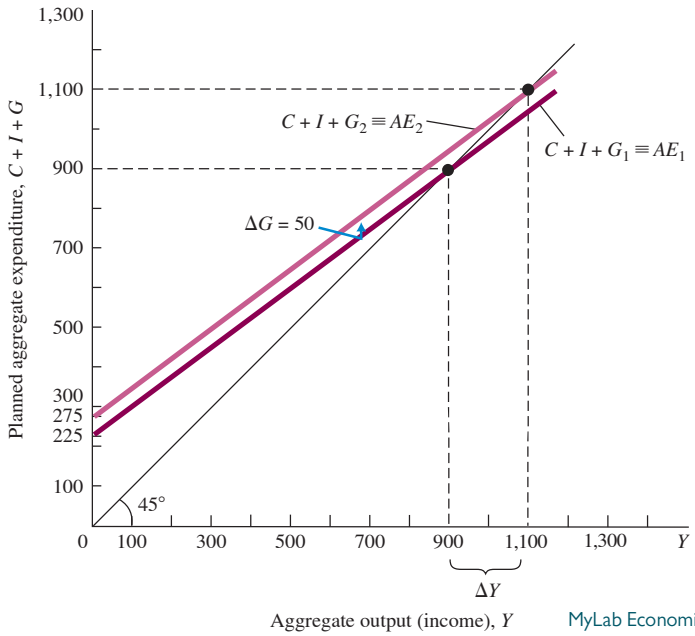


FIGURE 9.3 The Government Spending Multiplier
Increasing government spending by 50 shifts the AE function up by 50. As Y rises in response, additional consumption is generated. Overall, the equilibrium level of Y increases by 200, from 900 to 1,100.

MyLab Economics Concept Check

The Tax Multiplier MyLab Economics Concept Check

Remember that fiscal policy includes both spending and taxing policies. To see what effect a change in tax policy has on the economy, imagine the following. You are still chief economic adviser to the president, but now you are instructed to devise a plan to reduce unemployment to an acceptable level *without* increasing the level of government spending. In your plan, instead of increasing government spending (G), you decide to cut taxes and maintain the current level of spending. A tax cut increases disposable income, which is likely to lead to added consumption spending. (Remember our general rule that increased income leads to increased consumption.) Would a decrease in taxes affect aggregate output (income) the same as an equal increase in G?

A decrease in taxes would certainly increase aggregate output. The government spends no less than it did before the tax cut, and households find that they have a larger after-tax (or disposable) income than they had before. This leads to an increase in consumption. Planned aggregate expenditure will increase, which will lead to inventories being lower than planned, which will lead to more workers being hired to increase output. With more workers employed, more income will be generated, causing a second-round increase in consumption, and so on. Thus, income will increase by a multiple of the decrease in taxes, just as there was in the case of government spending, but there is a "wrinkle." The multiplier for a change in taxes is *not the same* as the multiplier for a change in government spending. Why does the **tax multiplier**—the ratio of change in the equilibrium level of output to a change in taxes—differ from the spending multiplier? To answer that question, we need to compare the ways in which a tax cut and a spending increase work their way through the economy.

tax multiplier The ratio of change in the equilibrium level of output to a change in taxes.

Look at Figure 9.1. When the government increases spending, there is an immediate and direct impact on the economy's *total* spending. An increase in G leads to a dollar-for-dollar increase in planned aggregate expenditure because G is a component of planned aggregate expenditure. When taxes are cut, there is no direct impact on spending. Taxes enter the picture only because they have an effect on the household's disposable income, which influences household's consumption (which is part of total spending). As Figure 9.1 shows, the tax cut flows through households before affecting aggregate expenditure.

Let us assume that the government decides to cut taxes by $1. By how much would spending increase? We already know the answer. The marginal propensity to consume (MPC) tells us how much consumption spending changes when disposable income changes. In the example running through this chapter, the marginal propensity to consume out of disposable income is 0.75. This means that if households' after-tax incomes rise by $1.00, they will increase their consumption not by the full $1.00, but by only $0.75.[2]

In summary, when government spending increases by $1, planned aggregate expenditure increases initially by the full amount of the rise in G, or $1. When taxes are cut, however, the initial increase in planned aggregate expenditure is only the MPC times the change in taxes. The final effect on the equilibrium level of income will be smaller because the initial increase in planned aggregate expenditure is smaller for a tax cut than for a government spending increase.

The size of the tax multiplier is calculated in the same way we derived the multiplier for an increase in investment and an increase in government purchases. The final change in the equilibrium level of output (income) (Y) is

$$\Delta Y = (\text{initial increase in aggregate expenditure}) \times \left(\frac{1}{MPS}\right)$$

Because the initial change in aggregate expenditure caused by a tax change of ΔT is $(-\Delta T \times MPC)$, we can solve for the tax multiplier by substitution:

$$\Delta Y = (-\Delta T \times MPC) \times \left(\frac{1}{MPS}\right) = -\Delta T \times \left(\frac{MPC}{MPS}\right)$$

[2]What happens to the other $0.25? Remember that whatever households do not consume is, by definition, saved. The other $0.25 thus gets allocated to saving.

A tax cut will cause an *increase* in consumption expenditures and output and a tax increase will cause a *reduction* in consumption expenditures and output so the tax multiplier is a negative multiplier:

$$\text{tax multiplier} \equiv -\left(\frac{MPC}{MPS}\right)$$

We derive the tax multiplier algebraically in Appendix A to this chapter.

If the *MPC* is .75, as in our example, the multiplier is $-0.75/0.25 = -3$. Notice the multiplier is negative as an increase in taxes takes money out of the household sector and reduces consumption and conversely for a tax cut. A tax cut of 100 will increase the equilibrium level of output by $-100 \times -3 = 300$. This is different from the effect of our government spending multiplier of 4. Under those same conditions, a 50 increase in *G* will increase the equilibrium level of output by 200 (50 × 4). If we wanted to increase output by 200, we would need a tax cut of 200/3 or 66.67.

The Balanced-Budget Multiplier MyLab Economics Concept Check

We have now discussed (1) changing government spending with no change in taxes and (2) changing taxes with no change in government spending. What if government spending and taxes are increased by the same amount? That is, what if the government decides to pay for its extra spending by increasing taxes by the same amount? The government's budget deficit would not change because the increase in expenditures would be matched by an increase in tax income.

You might think in this case that equal increases in government spending and taxes have no effect on equilibrium income. After all, the extra government spending equals the extra amount of tax revenues collected by the government. This is not so. Take, for example, a government spending increase of $40 billion. We know from the preceding analysis that an increase in *G* of 40, with taxes (*T*) held constant, should increase the equilibrium level of income by 40 × the government spending multiplier. The multiplier is 1/*MPS* or $1/0.25 = 4$. The equilibrium level of income should rise by 160 (40×4).

Now suppose that instead of keeping tax revenues constant, we finance the 40 increase in government spending with an equal increase in taxes so as to maintain a balanced budget. What happens to aggregate spending as a result of the rise in *G* and the rise in *T*? There are two initial effects. First, government spending rises by 40. This effect is direct, immediate, and positive. Now the government also collects 40 more in taxes. The tax increase has a *negative* impact on overall spending in the economy, but it does not fully offset the increase in government spending.

The final impact of a tax increase on aggregate expenditure depends on how households respond to it. The only thing we know about household behavior so far is that households spend 75 percent of their added income and save 25 percent. We know that when disposable income falls, both consumption and saving are reduced. A tax *increase* of 40 reduces disposable income by 40, and that means consumption falls by 40 × *MPC* and because $MPC = 0.75$, consumption falls by 30 (40×0.75). The net result in the beginning is that government spending rises by 40 and consumption spending falls by 30. Aggregate expenditure increases by 10 right after the simultaneous balanced-budget increases in *G* and *T*.

So a balanced-budget increase in *G* and *T* will raise output, but by how much? How large is this **balanced-budget multiplier?** The answer may surprise you:

$$\text{balanced} - \text{budget multiplier} \equiv 1$$

Let us combine what we know about the tax multiplier and the government spending multiplier to explain this. To find the final effect of a simultaneous increase in government spending and increase in net taxes, we need to add the multiplier effects of the two. The government spending multiplier is 1/*MPS*. The tax multiplier is $-MPC/MPS$. Their sum is $(1/MPS) + (-MPC/MPS) \equiv (1 - MPC)/MPS$. Because $MPC + MPS \equiv 1$, $1 - MPC \equiv MPS$. This means that $(1 - MPC)/MPS \equiv MPS/MPS \equiv 1$. (We also derive the balanced-budget multiplier in Appendix A to this chapter.)

balanced-budget multiplier The ratio of change in the equilibrium level of output to a change in government spending where the change in government spending is balanced by a change in taxes so as not to create any deficit. The balanced-budget multiplier is equal to one: the change in *Y* resulting from the change in *G* and the equal change in *T* is exactly the same size as the initial change in *G* or *T*.

TABLE 9.3 Finding Equilibrium after a Balanced-Budget Increase in G and T of 200 Each*

(1) Output (Income) Y	(2) Net Taxes T	(3) Disposable Income $Y_d = Y - T$	(4) Consumption Spending $C = 100 + 0.75Y_d$	(5) Planned Investment Spending I	(6) Government Purchases G	(7) Planned Aggregate Expenditure $C + I + G$	(8) Unplanned Inventory Change $Y - (C + I + G)$	(9) Adjustment to Disequilibrium
500	300	200	250	100	300	650	−150	Output ↑
700	300	400	400	100	300	800	−100	Output ↑
900	300	600	550	100	300	950	−50	Output ↑
1,100	**300**	**800**	**700**	**100**	**300**	**1,100**	**0**	**Equilibrium**
1,300	300	1,000	850	100	300	1,250	+50	Output ↓
1,500	300	1,200	1,000	100	300	1,400	+100	Output ↓

*Both G and T have increased from 100 in Table 9.1 to 300 here.

Returning to our example, recall that by using the government spending multiplier, a 40 increase in G would *raise* output at equilibrium by 160 (40 × the government spending multiplier of 4). By using the tax multiplier, we know that a tax hike of 40 will *reduce* the equilibrium level of output by 120 (40 × the tax multiplier, −3). The net effect is 160 minus 120, or 40. It should be clear then that the effect on equilibrium Y is equal to the balanced increase in G and T. In other words, the net increase in the equilibrium level of Y resulting from the change in G and the change in T are exactly the size of the initial change in G or T.

If the president wanted to raise Y by 200 without increasing the deficit, a simultaneous increase in G and T of 200 would do it. To see why, look at the numbers in Table 9.3. In Table 9.1, we saw an equilibrium level of output at 900. With both G and T up by 200, the new equilibrium is 1,100—higher by 200. At no other level of Y do we find $(C + I + G) = Y$. An increase in government spending has a direct initial effect on planned aggregate expenditure, a tax increase does not. The initial effect of the tax increase is that households cut consumption by the *MPC* times the change in taxes. This change in consumption is less than the change in taxes because the *MPC* is less than one. The positive stimulus from the government spending increase is thus greater than the negative stimulus from the tax increase. The net effect is that the balanced-budget multiplier is one.

Table 9.4 summarizes everything we have said about fiscal policy multipliers.

A Warning Although we have added government, the story told about the multiplier is still incomplete and oversimplified. For example, we have been treating net taxes (T) as a lump-sum, fixed amount, whereas in practice, taxes depend on income. Appendix B to this chapter shows that the size of the multiplier is reduced when we make the more realistic assumption that taxes depend on income. We continue to add more realism and difficulty to our analysis in the chapters that follow.

TABLE 9.4 Summary of Fiscal Policy Multipliers

	Policy Stimulus	Multiplier	Final Impact on Equilibrium Y
Government spending multiplier	Increase or decrease in the level of government purchases: ΔG	$\frac{1}{MPS}$	$\Delta G \times \frac{1}{MPS}$
Tax multiplier	Increase or decrease in the level of net taxes: ΔT	$\frac{-MPC}{MPS}$	$\Delta T \times \frac{-MPC}{MPS}$
Balanced-budget multiplier	Simultaneous balanced-budget increase or decrease in the level of government purchases and net taxes: $\Delta G = \Delta T$	1	ΔG

The Federal Budget

9.3 LEARNING OBJECTIVE

Compare and contrast the federal budgets of three U.S. government administrations.

The **federal budget** lists in detail all the things the government plans to spend money on and all the sources of government revenues for the coming year. It therefore describes the government's fiscal policy in granular detail. Of course, the budget is not simply an economic document but is the product of a complex interplay of social, political, and economic forces.

federal budget The budget of the federal government.

The Budget in 2017 MyLab Economics Concept Check

A highly aggregated version of the federal budget is shown in Table 9.5. In 2017, the government had total receipts of $3,587.4 billion, largely from personal income taxes ($1,603.5 billion) and contributions for social insurance ($1,287.3 billion). (Contributions for social insurance are employer and employee Social Security taxes.) Receipts from corporate income taxes accounted for $401.3 billion, or only 11.2 percent of total receipts. Not everyone is aware of the fact that corporate income taxes as a percentage of government receipts are quite small relative to personal income taxes and Social Security taxes. With the tax reform of 2017, corporate taxes as a share of government receipts are likely to fall further.

The federal government also spent $4,252.5 billion in expenditures in 2017. Of this, $2,074.5 billion represented transfer payments to persons (Social Security benefits, military retirement benefits, and unemployment compensation).[3] Consumption ($977.8 billion) was the next-largest component, followed by grants-in-aid given to state and local governments by the federal government ($559.6 billion), and interest payments on the federal debt ($504.9 billion).

The difference between the federal government's receipts and its expenditures is the **federal surplus (+) *or* deficit (−)**, which is federal government saving. Table 9.5 shows that the federal government spent much more than it took in during 2017, resulting in a deficit of $665.1 billion.

federal surplus (+) *or* (−) deficit Federal government receipts minus expenditures.

TABLE 9.5 Federal Government Receipts and Expenditures, 2017

	Amount (Billions, $)	Percentage of Total (%)
Current receipts		
Personal income taxes	1,605.3	44.7
Excise taxes and customs duties	132.3	3.7
Corporate income taxes	401.3	11.2
Taxes from the rest of the world	22.4	0.6
Contributions for social insurance	1,287.3	35.9
Interest receipts and rents and royalties	58.5	1.6
Current transfer receipts from business and persons	86.5	2.4
Current surplus of government enterprises	−3.5	−0.1
Total	3,587.4	100.0
Current expenditures		
Consumption expenditures	977.8	23.0
Transfer payments to persons	2,074.5	48.8
Transfer payments to the rest of the world	74.9	1.8
Grants-in-aid to state and local governments	559.6	13.2
Interest payments	504.9	11.9
Subsidies	60.8	1.4
Total	4,252.5	100.0
Net federal government saving–surplus (+) or deficit (−)		
(Total current receipts − Total current expenditures)	−665.1	

Note: Numbers may not add exactly because of rounding.
Source: U.S. Bureau of Economic Analysis, March 28, 2018.

MyLab Economics Real-time data

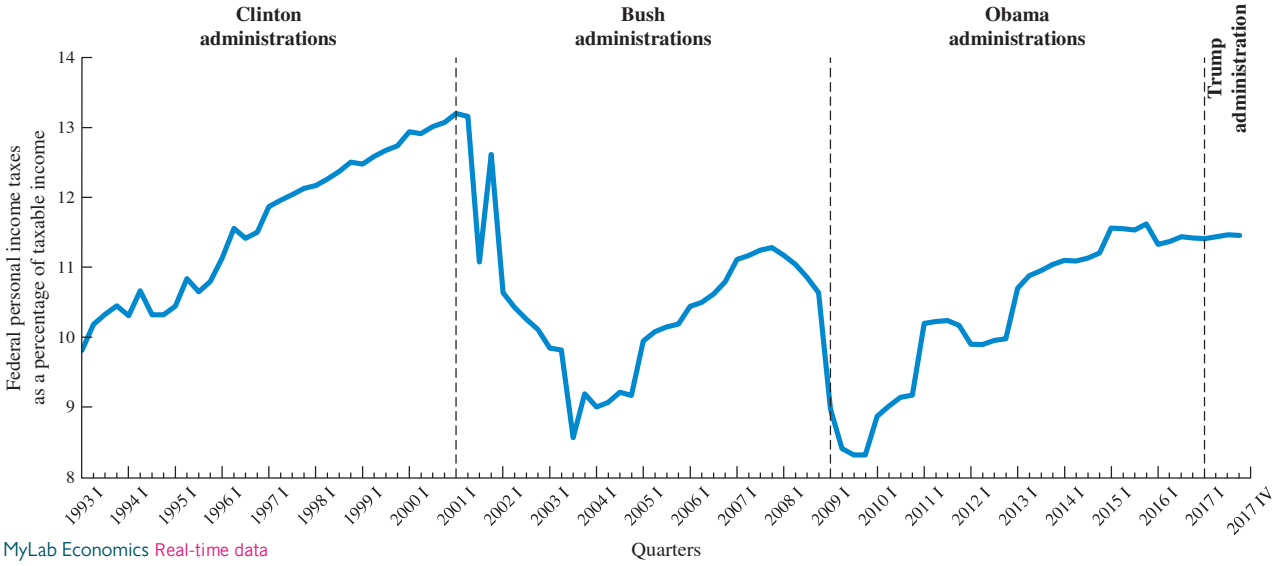
[3]Remember that there is an important difference between transfer payments and government purchases of goods and services (consumption expenditures). Much of the government budget goes for things that an economist would classify as transfers (payments that are grants or gifts) instead of purchases of goods and services. Only the latter are included in our variable *G*. Transfers are counted as part of net taxes.

Fiscal Policy since 1993: The Clinton, Bush, Obama, and Trump Administrations MyLab Economics Concept Check

Between 1993 and the current edition of this text, the United States has had four different presidents, two Democrats and two Republicans. The fiscal policy implemented by each president reflects both the political philosophy of the administration and the differing economic conditions each faced. Figures 9.4, 9.5, and 9.6 trace the fiscal policies of the Clinton (1993–2000), Bush (2001–2008), and Obama administrations (2009–2016), and first year of the Trump administration (2017).

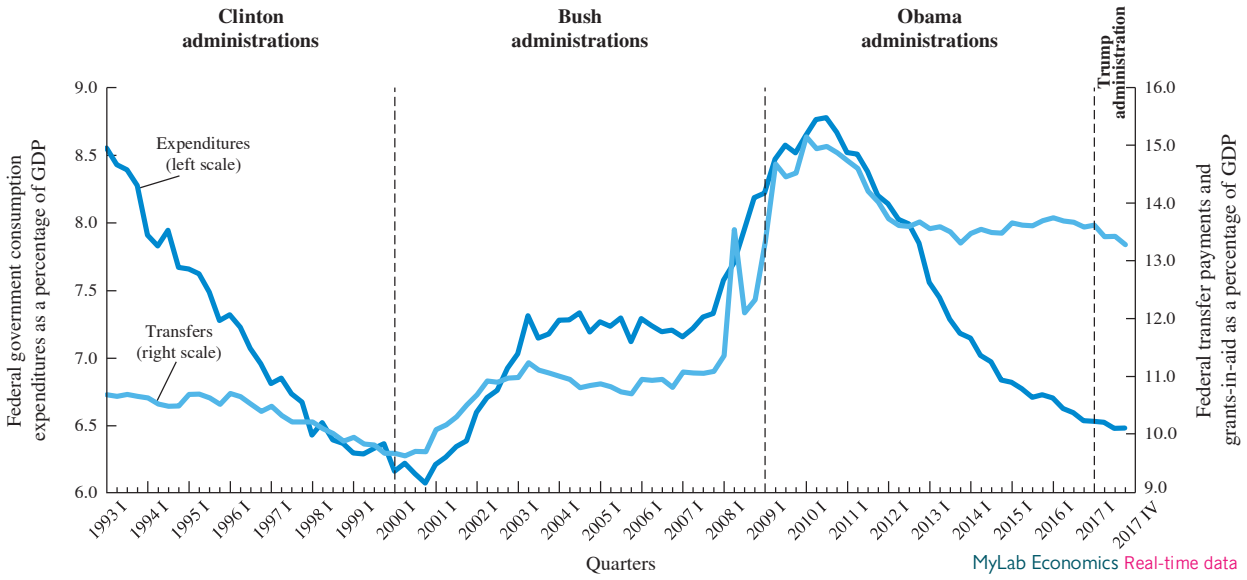
Figure 9.4 plots total federal personal income taxes as a percentage of total taxable income. This is a graph of the average personal income tax rate. As the figure shows, the average tax rate increased substantially during the Clinton administrations. Much of this increase was the result of a tax bill that was passed in 1993 during the first Clinton administration. The figure then shows the dramatic effects of the tax cuts during the first Bush administration. The large fall in the average tax rate in 2001 III was because of a tax rebate passed after the 9/11 terrorist attacks. Although the average tax rate went back up in 2001 IV, it then fell substantially as the Bush tax cuts began to be felt. The average tax rate remained low during the beginning of the first Obama administration. This was in part due to the large ($787 billion) stimulus bill that was passed in February 2009. The bill consisted of tax cuts and government spending increases, mostly for the 2009–2010 period enacted in response to the recession. In 2011–2012 the average tax rate was somewhat higher than it was in 2009–2010 because of the winding down of the stimulus bill. The average tax rate generally rose from 2010 to 2015 and then leveled out. In December of 2017 a significant tax act was passed by Congress and signed by President Trump, to go into effect beginning in 2018. The act included large cuts in corporate taxes, but also some cuts in personal income taxes. When data are available for 2018 and beyond, the line in Figure 9.4 is likely to turn down. To summarize, the overall tax policy of the federal government is fairly clear from Figure 9.4. The average tax rate rose sharply under President Clinton, fell sharply under President Bush, and remained low initially under President Obama before beginning to rise. It is likely to fall in 2018 and beyond under President Trump.

Table 9.5 shows that the three most important spending variables of the federal government are consumption expenditures, transfer payments to persons, and grants-in-aid to state and local governments. Consumption expenditures, which are government expenditures on goods and services, are part of GDP. Transfer payments and grants-in-aid are not spending on current output (GDP), but just transfers from the federal government to people and state and local governments. Figure 9.5 plots two spending ratios. One is federal government consumption expenditures as a percentage of GDP, and the other is transfer payments to persons plus grants-in-aid to state and local governments as a percentage of GDP. The figure shows that consumption expenditures as a percentage of GDP generally fell during the Clinton administrations,



MyLab Economics Real-time data

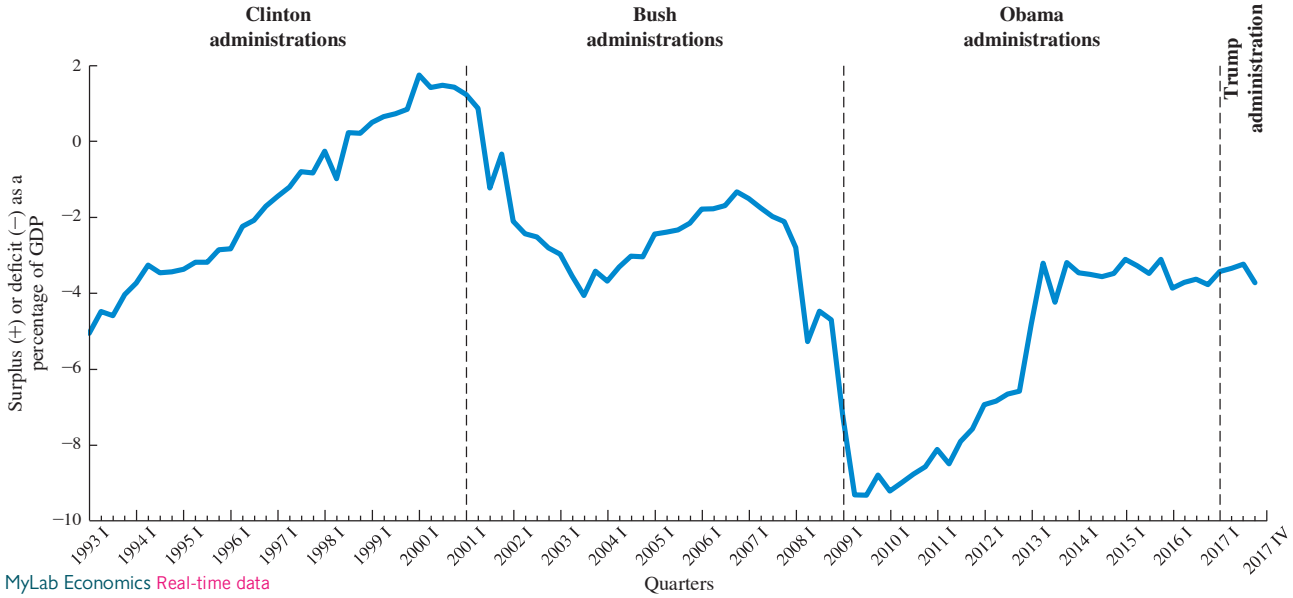
▲ FIGURE 9.4 **Federal Personal Income Taxes as a Percentage of Taxable Income, 1993 I–2017 IV**



▲ **FIGURE 9.5 Federal Government Consumption Expenditures as a Percentage of GDP and Federal Transfer Payments and Grants-in-Aid as a Percentage of GDP, 1993 I–2017 IV**

generally rose during the Bush administrations, and was quite high during the first Obama administration. The increase during the Bush administrations reflects primarily the spending on the Iraq war. The initial increase during the Obama administration reflects the effects of the stimulus bill and increased spending for the Afghanistan war. Expenditures as a fraction of GDP fell considerably during the second Obama administration. The fraction was essentially unchanged during the first year of the Trump administration. In early 2018 U.S. budget bills were passed that will lead to increased government spending in 2018 and beyond. The expenditure line in Figure 9.5 is thus likely to rise when extended into 2018 and beyond.

Figure 9.5 also shows that transfer payments as a percentage of GDP generally rose during the Bush administrations especially near the end, and remained high in the Obama administrations and into the Trump administration. The percent was flat or slightly falling during the Clinton administrations. Some of the fall between 1996 and 2000 was because of President Clinton's welfare reform legislation. Some of the rise from 2001 on is as a result of increased



▲ **FIGURE 9.6 The Federal Government Surplus (+) or Deficit (−) as a Percentage of GDP, 1993 I–2017 IV**

Medicare payments. The high initial values in the Obama administration again reflect the effects of the stimulus bill and various extensions.

Figure 9.6 plots the federal government surplus (+) or deficit (−1) as a percentage of GDP. The figure shows that during the Clinton administrations the federal budget moved from substantial deficit to noticeable surplus. This, of course, should not be surprising because the average tax rate generally rose during this period and spending as a percentage of GDP generally fell. Figure 9.6 then shows that the surplus turned into a substantial deficit during the first Bush administration. This also should not be surprising since the average tax rate generally fell during this period and spending as a percentage of GDP generally rose. The deficit rose sharply in the beginning of the Obama administration—to 9.3 percent of GDP by the second quarter of 2009. Again, this is not a surprise. The average tax rate remained low and spending increased substantially. The deficit-to-GDP ratio was roughly constant at about 3.5 percent during the second Obama administration and the first year of the Trump administration. Given the tax cuts that were passed at the end of 2017 and the spending increases that were passed at the beginning of 2018, the deficit-to-GDP ratio is likely to rise substantially from 2018 on. The *Economics in Practice* box discusses Spain's regional budget constraints.

As you look at the differences in the three figures, you should remember that the decisions that governments make about levels of spending and taxes reflect not only macroeconomic

ECONOMICS IN PRACTICE

Regional Autonomy and Government Budgeting in Spain

To avoid cessation aspirations by Catalonia and the Basque, Spain has undergone massive political and fiscal decentralization over the last three decades. However, the Catalonian independence referendum of October 2017 demonstrates that the autonomy granted to regional governments was not sufficient. Aside from a strong ethnic identity and cultural pride, the main grievance of the Catalonians is that Spain's fiscal expenditure is far from equitable.

Spanish regions administer most taxes in their jurisdiction and are required to contribute an annual sum to the central government. The Spanish fiscal equalization program aims to reduce regional inequalities by increasing welfare expenditure in deprived regions regardless of their tax capacity.

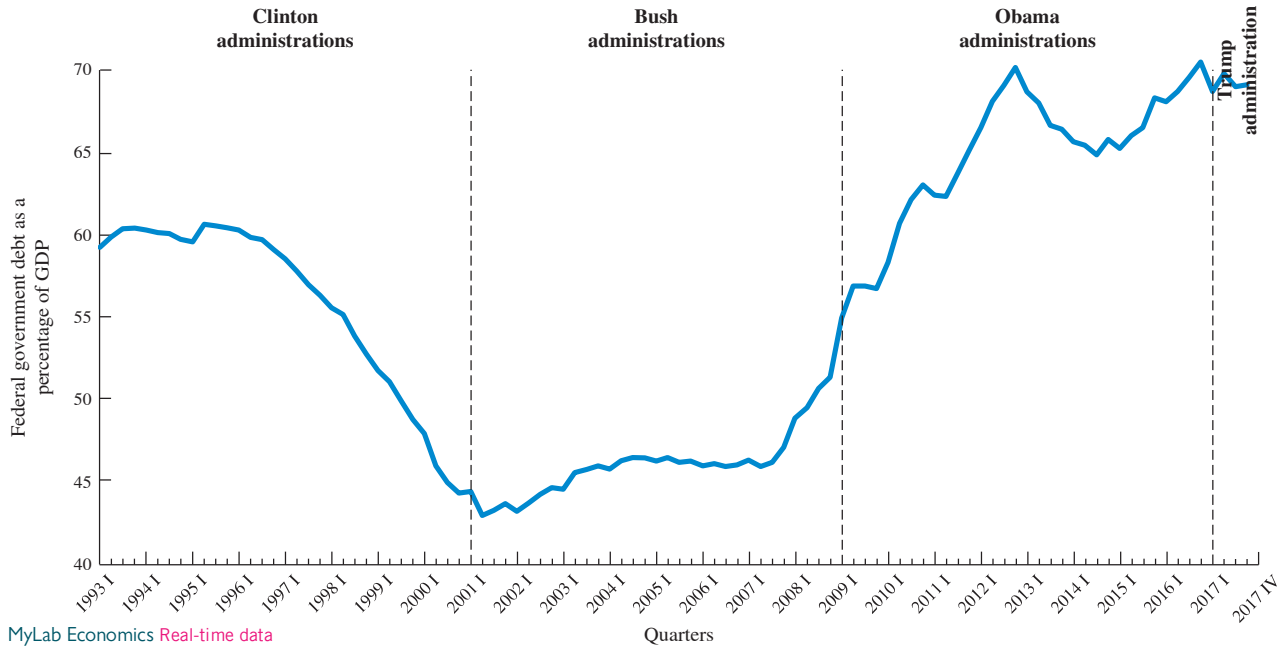
While its population makes up only 16 percent of the total population of Spain, Catalonia's GDP comprises 20 percent of national GDP. Yet, it receives only 11 percent of national expenditure. During the European Sovereign Debt crisis of 2011–2015, severe austerity measures obliged regional governments to borrow in order to cover their public expenditures. Paying €10 billion more than what reached their region, the Catalonian public debt to GDP ratio in 2017 stood at 35.3 percent, compared to Spain's average of 24.2 percent in the same year.

Fiscal revenue and expenditure autonomy are requisites of regional political autonomy. To avoid future disputes,

Spain may need to impose harder regional budget constraints and match spending needs with tax capacities for each of its jurisdictions.

CRITICAL THINKING

1. How do you the think the European Debt Crisis has contributed to the fiscal problem in Spain and Catalonia? How can this be avoided in the future?



▲ **FIGURE 9.7 The Federal Government Debt as a Percentage of GDP, 1993 I–2017 IV**

concerns, but also microeconomic issues and political philosophy. President Clinton's welfare reform program resulted in a decrease in government transfer payments but was motivated in part by interest in improving market incentives. President Bush's early tax cuts were based less on macroeconomic concerns than on political philosophy, while the increased spending came from developments in international relations. President Obama's fiscal policy, on the other hand, was motivated by macroeconomic concerns. The stimulus bill was designed to mitigate the effects of the recession that began in 2008. Whether tax and spending policies are motivated by macroeconomic concerns or not, they have macroeconomic consequences.

The Federal Government Debt MyLab Economics Concept Check

When the government runs a deficit, it must borrow to finance it. To borrow, the federal government sells government securities to the public, which it pays interest on. In return, it receives funds from the buyers of the securities and uses these funds to pay its bills. This borrowing increases the **federal debt**, the total amount owed by the federal government. The federal debt is the total of all accumulated deficits minus surpluses over time. Conversely, if the government runs a surplus, the federal debt falls.

federal debt The total amount owed by the federal government.

Some of the securities that the government issues end up being held by the federal government at the Federal Reserve or in government trust funds, the largest of which is Social Security. The term **privately held federal debt** refers to the non-government-owned debt of the U.S. government.

privately held federal debt The privately held (non-government-owned) debt of the U.S. government.

The privately held federal government debt as a percentage of GDP is plotted in Figure 9.7 for the 1993 I–2017 IV period. The percentage fell during the second Clinton administration, when the budget was in surplus, and it mostly rose during the Bush administrations, when the budget was in deficit. The rise during the first Obama administration was dramatic, reaching 70 percent at the end of 2012. The debt to GDP ratio remained high during the second Obama administration and into the first year of the Trump administration. With higher deficits projected from 2018 on, the ratio is likely to rise substantially from 2018 on.

9.4 LEARNING OBJECTIVE

Explain the influence of the economy on the federal government budget.

The Economy's Influence on the Government Budget

We have just seen that an administration's fiscal policy is sometimes affected by the state of the economy. The Obama administration, for example, increased government spending and lowered taxes in response to the recession of 2008–2009. It is also the case, however, that the economy affects the federal government budget even if there are no explicit fiscal policy changes. There are effects that the government has no direct control over. They can be lumped under the general heading of "automatic stabilizers and destabilizers."

Automatic Stabilizers and Destabilizers MyLab Economics Concept Check

Most of the tax revenues of the government result from applying a tax rate decided by the government to a base that reflects the underlying activity of the economy. The corporate profits tax, for example, comes from applying a rate (say 20 percent) to the profits earned by firms. Income taxes come from applying rates shown in tax tables to income earned by individuals. Tax revenues thus depend on the state of the economy even when the government does not change tax rates. When the economy goes into a recession, tax revenues will fall, even if rates remain constant, and when the economy picks up, so will tax revenues. As a result, deficits fall in expansions and rise in recessions, other things being equal.

Some items on the expenditure side of the government budget also automatically change as the economy changes. If the economy declines, unemployment increases, which leads to an increase in unemployment benefits. General assistance to the needy, food stamp allotments, and similar transfer payments also increase in recessions and decrease in expansions.

automatic stabilizers Revenue and expenditure items in the federal budget that automatically change with the state of the economy in such a way as to stabilize GDP.

These automatic changes in government revenues and expenditures are called **automatic stabilizers**. They help stabilize the economy. In recessions, taxes fall and expenditures rise, which creates positive effects on the economy, and in expansions, the opposite happens. The government does not have to change any laws for this to happen.

automatic destabilizers Revenue and expenditure items in the federal budget that automatically change with the state of the economy in such a way as to destabilize GDP.

Another reason that government spending is not completely controllable is that inflation often picks up in an expansion. We saw in Chapter 7 that some government transfer payments are tied to the rate of inflation (changes in the CPI); so these transfer payments increase as inflation increases. Some medical care transfer payments also increase as the prices of medical care rise, and these prices may be affected by the overall rate of inflation. To the extent that inflation is more likely to increase in an expansion than in a recession, inflation can be considered to be an **automatic destabilizer**. Government spending increases as inflation increases, which further fuels the expansion, which is destabilizing. If inflation decreases in a recession, there is an automatic decrease in government spending, which makes the recession worse.

We will see in later chapters that interest rates tend to rise in expansions and fall in recessions. When interest rates rise, government interest payments to households and firms increase (because households and firms hold much of the government debt), which is interest income to the households and firms. Government spending on interest payments thus tends to rise in expansions and fall in contractions, which, other things being equal, is destabilizing. We will see in later chapters that a rise in interest rates can also lead for other reasons to a decrease in consumption (and investment), which, other things being equal, is stabilizing. The net effect of interest rate changes is generally stabilizing, but this is getting ahead of our story.

fiscal drag The negative effect on the economy that occurs when average tax rates increase because taxpayers have moved into higher income brackets during an expansion.

Since 1982 personal income tax brackets have been tied to the overall price level. Prior to this they were not, which led to what was called **fiscal drag**. If tax brackets are not tied to the price level, then as the price level rises and thus people's nominal incomes rise, people move into higher brackets; so the average tax rates that they pay increase. This is a "drag" on the economy, hence the name fiscal drag. In 1982, the United States instituted an alternative Minimum Tax (AMT), directed at higher income individuals who had a number of special tax deductions. These individuals were subject to an alternative calculation of their income taxes, which essentially eliminated some deductions and imposed a (lower) flat tax. In contrast to the standard tax tables, the income level at which the AMT would kick in remained constant over the subsequent 30 years until finally indexed to inflation in 2013. For this period, the AMT tax created fiscal drag. It is interesting to note that fiscal drag is actually an automatic stabilizer in that the number of people moving into higher tax brackets increases in expansions and falls in contractions. By indexing the tax brackets to the overall price level, the legislation in 1982 eliminated the fiscal drag

caused by inflation from taxes other than the AMT. If incomes rise only because of inflation, there is no change in average tax rates because the brackets are changed each year. The inflation part of the automatic stabilizer has been eliminated.

Full-Employment Budget MyLab Economics Concept Check

We have seen that the state of the economy has a big effect on the budget deficit. When the economy turns down, automatic stabilizers act to increase the deficit; the government may also take further actions intended to pull the economy out of a slump. Under these conditions, running a deficit may seem like a good idea. When the economy is thriving, however, deficits may be more problematic. In particular, if the government runs deficits in good times as well as bad, the overall debt is surely going to rise, which may be unsustainable in the long run. Instead of looking simply at the size of the surplus or deficit, economists have developed an alternative way to calibrate deficits. By examining what the budget would be like if the economy were producing at the full-employment level of output—the so-called **full-employment budget**—we can establish a benchmark for evaluating fiscal policy.

full-employment budget What the federal budget would be if the economy were producing at the full-employment level of output.

The distinction between the actual and full-employment budget is important. Suppose the economy is in a slump and the deficit is $250 billion. Also suppose that if there were full employment, the deficit would fall to $75 billion. The $75 billion deficit that would remain even with full employment would be because of the structure of tax and spending programs instead of the state of the economy. This deficit—the deficit that remains at full employment—is sometimes called the **structural deficit**. The $175 billion ($250 billion − $75 billion) part of the deficit caused by the fact the economy is in a slump is known as the **cyclical deficit**. The existence of the cyclical deficit depends on where the economy is in the business cycle, and it ceases to exist when full employment is reached. By definition, the cyclical deficit of the full-employment budget is zero.

structural deficit The deficit that remains at full employment.

cyclical deficit The deficit that occurs because of a downturn in the business cycle.

Table 9.5 shows that the federal government deficit in 2014 was $582.3 billion. How much of this was cyclical and how much was structural? The U.S. economy was still not quite at full employment in 2014, and so some of the deficit was cyclical.

Looking Ahead

We have now seen how households, firms, and the government interact in the goods market, how equilibrium output (income) is determined, and how the government uses fiscal policy to influence the economy. In the next chapter we analyze the money market and monetary policy—the government's other major tool for influencing the economy.

SUMMARY

1. The government can affect the macroeconomy through two specific policy channels. *Fiscal policy* refers to the government's taxing and spending behavior. *Discretionary fiscal policy* refers to changes in taxes or spending that are the result of deliberate changes in government policy. *Monetary policy* refers to the behavior of the Federal Reserve concerning the interest rate.

9.1 GOVERNMENT IN THE ECONOMY *p. 191*

2. The government does not have complete control over tax revenues and certain expenditures, which are partially dictated by the state of the economy.
3. As a participant in the economy, the government makes purchases of goods and services (G), collects taxes, and makes transfer payments to households. *Net taxes* (T) is equal to the tax payments made to the government by firms and households minus transfer payments made to households by the government.
4. *Disposable*, or *after-tax, income* (Y_d) is equal to the amount of income received by households after taxes: $Y_d \equiv Y - T$. After-tax income determines households' consumption behavior.
5. The *budget deficit* is equal to the difference between what the government spends and what it collects in taxes: $G - T$. When G exceeds T, the government must borrow from the public to finance its deficit.
6. In an economy in which government is a participant, planned aggregate expenditure equals consumption spending by households (C) plus planned investment spending by firms (I) plus government spending on goods and services (G): $AE \equiv C + I + G$. Because the condition $Y = AE$ is necessary for the economy to be in equilibrium, it follows that $Y = C + I + G$ is the macroeconomic equilibrium condition. The economy is also in equilibrium when leakages out of the system equal injections into the system. This occurs when

MyLab Economics Visit **www.pearson.com/mylab/economics** to complete these exercises online and get instant feedback. Exercises that update with real-time data are marked with .