

# CHAPTER 8

## The Circular Flow of Income and Expenditure



### *After reading this chapter, you will understand the following:*

1. How households and firms are linked by incomes and expenditures
2. How expenditure is divided into consumption, investment, government purchases, and net exports
3. The relationships between injections and leakages in the circular flow
4. Why some investment is planned and other is unplanned
5. How the concept of equilibrium can be applied to the circular flow of income and expenditure
6. What the multiplier effect is and how it is related to the business cycle

### *Before reading this chapter, make sure you know the meaning of the concepts:*

1. Gross domestic product (GDP)
2. Opportunity cost
3. Equilibrium
4. Inventories
5. Real and nominal values
6. The business cycle

**T**HE PREVIOUS CHAPTER took a long-term perspective on growth of GDP. Sources of output growth were broken down into growth of labor inputs, increases in capital per worker, and improvements in technology and organization. Discussions of changes in GDP in the short run typically take a different perspective. For example, in January 2009 the government reported that U.S. real GDP fell at a 3.8 percent annual rate in the fourth quarter of 2008, the sharpest drop since 1982. News reports said nothing about growth of population, capital, or total factor productivity. Instead, they focused on the behavior of individual components of GDP. Consumption expenditures,

especially for durable goods like cars, led the decline in total GDP. Exports, also, decreased as U.S. trading partners also slipped into recession. Federal government purchases rose moderately, counter to the trend of other GDP components, but the rise was partially offset by weakness of spending by state and local governments.

The data on investment received special attention. Overall, investment was down; but one category, increases in inventory, was up. While inventory investment helped moderate the total drop in GDP for the fourth quarter, it was taken as a bad sign for the future. At this point in the business cycle, the increase in business inventories did not reflect an optimistic stocking up by businesses to meet growing consumer demand. Instead, it was an unplanned buildup resulting from disappointing sales. Business firms were expected to cut back their orders for goods in the new year until the unwanted inventory buildup was worked off.

This chapter will adopt the same focus on GDP components as that used in news reports. It begins by introducing the **circular flow of income and product**, dividing the economy into five major sectors, and showing important linkages among them. In the second part of the chapter, the circular flow is used to develop the important concept of planned expenditure, which serves as a first step in building a general theory of macroeconomics.

### Circular flow of income and product

The flow of goods and services between households and firms, balanced by the flow of payments made in exchange for goods and services

### Gross domestic product (GDP)

The value at current market prices of all final goods and services produced annually in a given country

### Gross domestic income (domestic income)

The total income of all types, including wages, rents, interest payments, and profits, paid in return for factors of production used in producing domestic product

## The Circular Flow

Figure 8.1 divides the economy into five main sectors: firms, households, government, financial markets, and the rest of the world. Arrows indicate flows of payments among the sectors. We can begin with the largest and most important set of flows, those representing the incomes that households receive from business firms and the expenditures they make in purchasing goods and services from those same firms.

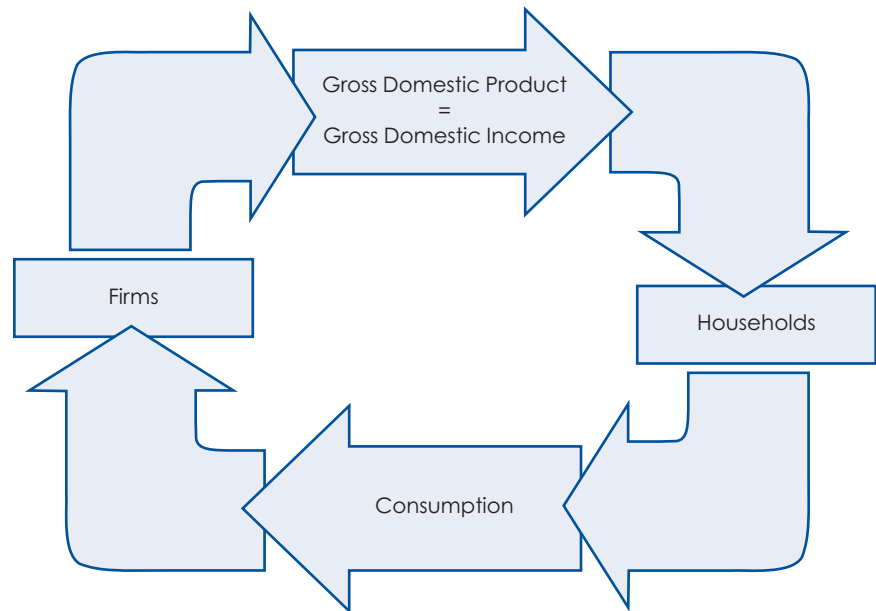
### *Gross Domestic Product, Domestic Income, and Consumption*

At the top of Figure 8.1 we encounter **gross domestic product (GDP)**, a measure of a country's total output of goods and services. The production of goods and services by business firms generates income for the country's households.<sup>1</sup> The bulk of this income consists of wages and salaries. Some is also paid out in interest, rents, and royalties on capital and natural resources owned by households and loaned or sold to firms. Whatever firms have left over, after they have paid all wages and other costs of production, is profit. Profit is earned by the firm's owners, who are a subset of households.<sup>2</sup>

The sum of income received in the form of wages, rents, interest, and profit by all households is known as **gross domestic income**, or for short, simply **domestic income**. From the way the circular flow is drawn, it is clear that domestic income and domestic product must be equal, since payments equal to the value of what is produced and sold are paid out to households—either as elements of costs (wages, interest, rents) or as profit (what is left over when cost is subtracted from the value of output).<sup>3</sup>

In Figure 8.1, which shows the simplest imaginable economy, households immediately spend all the income they receive to purchase goods and services from the firms that

FIGURE 8.1 THE BASIC CIRCULAR FLOW OF INCOME AND EXPENDITURE



This figure shows flows of income and expenditure for the simplest possible economy. Production, carried out by firms, generates incomes for households in the form of wages, interest, rents, and profits. Households, in turn, immediately spend all of their income on consumption.

### Consumption

All purchases of goods and services by households for the purpose of immediate use

### Closed economy

An economy that has no links to the rest of the world

### Leakages

The saving, net tax, and import components of the circular flow.

### Net taxes

Tax revenue minus transfer payments

pay them their incomes. The corresponding arrow is labeled **consumption**, which includes all purchases of goods and services for immediate use. (Purchases by households of long-lasting items like houses and apartments are discussed in the next section.)

### Leakages and Injections in a Closed Economy

The economy shown in Figure 8.1 is called a **closed economy** because it has no connection with the rest of the world. Even in a closed economy, however, the circular flow is not really so watertight as shown in that diagram. Instead of spending all of their income immediately on consumption, part of household income “leaks out” of the basic circular flow as shown in Figure 8.2. Two types of **leakages** are shown there.

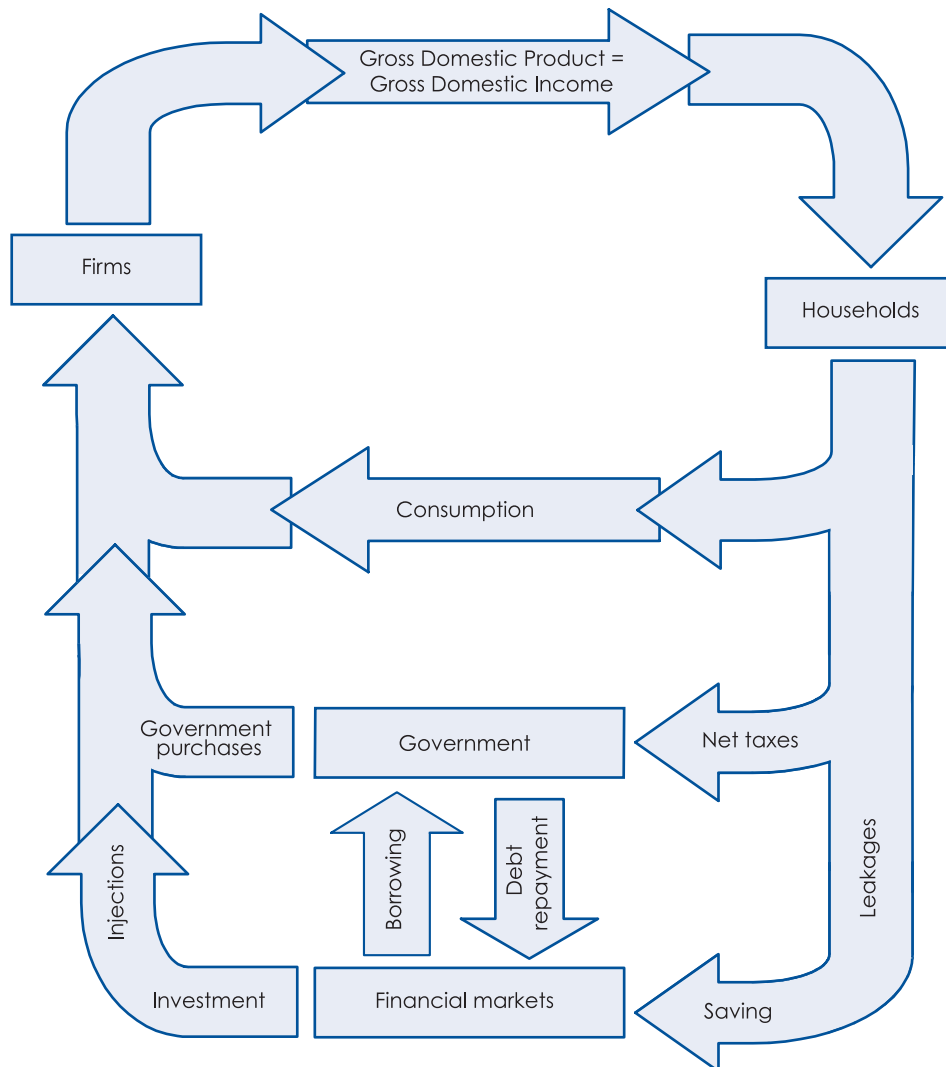
The first leakage is labeled **net taxes**. These consist of **tax revenues** paid by households to government minus **transfer payments** received by households. Transfer payments mean government payments like pensions, retirement benefits, disability payments, temporary aid to needy families, and so on. In everyday life, we tend to think of retirement benefits or disability payments as another form of income, so we might expect to see them added to the domestic income component of the circular flow. For reasons that will become clear in the following chapters, however, economists prefer to think of them more as a sort of “tax rebate” that partially offsets the revenue received by government from households in the form of income taxes, sales taxes, property taxes, and so on.

**Tax revenue**

The total value of all taxes collected by government

The second leakage shown in Figure 8.2 is **saving**. Saving is the part of domestic income that is not used by households to purchase consumer goods or pay taxes. This economic definition of saving differs a little from the everyday idea of saving as money placed in a bank account or mutual fund. Saving, in the economic sense, also includes repayment of debt and spending that builds equity in a home. Also, corporations sometimes retain part of their profit for reinvestment in their operations. Looked at from the point of view of the circular flow, we can consider the retained earnings to be

**FIGURE 8.2 LEAKAGES AND INJECTIONS IN A SIMPLE CLOSED ECONOMY**



Households do not spend all of their income on consumption. Part of it "leaks out" of the basic circular flow of income and consumption through payments of taxes and through saving. These two leakages are balanced by "injections" of expenditure into the basic circular flow in the form of government purchases and investment. Total leakages ( $S + T$ ) must equal total injections ( $I + G$ ) for this simple closed economy.

### Transfer payments

Payments by government to individuals not made in return for services currently performed, for example, unemployment compensation and pensions

### Saving

The part of household income that is not used to buy goods and services or to pay taxes

### Injections

The government purchase, investment, and net export components of the circular flow

first “earned” by the households who own the firm and then “saved” by those households in the sense that they, as shareholders, approve the idea of using the retained profits for reinvestment.

To match the leakages, Figure 8.2 also shows two **injections**. Injections are types of expenditure on goods and services that have any origin other than the household consumption that was shown as part of the basic circular flow in Figure 8.1.

The first injection is **government purchases of goods and services** or, more simply, **government purchases**. These include all purchases of goods made by all levels of government (national, regional and local) plus services purchased from contractors and the wages paid to all government employees. Government purchases do not include transfer payments like social security, disability payments, or unemployment compensation. As explained earlier, those items, which are not payments for currently performed services, are subtracted from tax revenue to get the leakage “net taxes.” The sum of government purchases of goods and services plus transfer payments is called **government expenditures** or, sometimes, **government outlays**.

The second injection is **investment**. Investment, as the term is understood in macroeconomics, is made up of two components. The first, **fixed investment**, means purchases of newly produced capital goods—machinery, office equipment, software, farm equipment, construction of buildings used for business purposes, including construction of rental housing, and so on. The second component, **inventory investment**, means changes in stocks of finished goods ready for sale, stocks of raw materials, and stocks of partially completed goods in process of production. Inventory investment has a negative value if stocks of goods decrease in a given period.

The term *investment* as used in macroeconomic models is sometimes called *economic investment* to emphasize that it means expenditures on real productive assets and inventories. Economic investment should not be confused with *financial investment*, which means purchases of corporate stocks, bonds, and other securities. The latter are



Farm equipment is a large part of farming fixed investments.

**Government purchases of goods and services (government purchases)**

Purchases of goods by all levels of government plus purchases of services from contractors and wages of government employees

**Government expenditures (government outlays)**

Government purchases of goods and services plus transfer payments

**Investment**

The sum of fixed investment and inventory investment

**Fixed investment**

Purchases of newly produced capital goods

**Inventory investment**

Changes in stocks of finished goods ready for sale, raw materials, and partially completed goods in process of production

not included in GDP because they do not represent new production, but rather are changes in ownership of assets that already exist. When the term investment is used without modifier, it is usually clear from context whether economic or financial investment is meant.

*The Role of the Financial Sector*

In addition to the leakages and injections that have been mentioned, Figure 8.2 includes an important box that represents the economy's financial sector. This sector includes banks, mutual funds, insurance companies, and a host of other financial institutions, some of which will be discussed in detail in later chapters. As an element of the circular flow, the financial sector performs two functions.

First, it acts as an intermediary in transmitting flows of funds from savers to investors. In most cases, savers do not directly purchase productive assets like machine tools or office buildings. Instead, they make bank deposits, which are used by banks to make loans, buy securities like stocks and bonds, or in other ways indirectly finance the expenditures on capital goods that make up the “investment” arrow in the circular flow diagram.

Second, the financial sector plays a key role in redirecting flows of funds between the private and government sectors of the economy. Without the financial sector, the government would always have to balance its budget, exactly, every year. In terms of the diagram, the amount of funds flowing through the “net taxes” arrow would have to be exactly equal to the flow through the “government purchases” arrow. With the help of the financial sector, the government budget does not have to be balanced.

If government purchases exceed net taxes, the government has a budget deficit. To cover the deficit, the government must then borrow from the private financial sector. In most cases, it does this by selling bonds to private investors through the financial markets. The resulting flow of government borrowing is shown as an arrow running from the financial sector to the government.

On the other hand, the government sometimes collects more in net taxes than it spends on purchases of goods and services. In that case, the budget is in surplus. The surplus funds are used to repay past debt. The result is an arrow from the government sector to the private financial sector. In practice, since there are many units of government—federal, state, and local—at any given time some of them may have budget deficits and others budget surpluses; thus, funds are usually flowing in both ways at once between the financial and government sectors.<sup>4</sup>

Before moving on, it is worth pointing out one more feature of the circular flow. In a closed economy like that of Figure 8.2, which has no links to the rest of the world, the sum of saving plus net taxes must equal the sum of investment plus government purchases, even though the individual leakage and injection items do not have to balance. This fact has important implications for economic policy. If the government runs too large a deficit, borrowing too much from financial markets, not enough saving may be left over to meet the country's investment needs. That can result in a condition of high interest rates and slow growth for the economy as a whole. On the other hand, if the government has a budget surplus, additional funds flow into financial mar-

### Open economy

An economy that is linked to the outside world by imports, exports, and financial transactions

### Imports

A leakage from the circular flow consisting of payments made for goods and services purchased from the rest of the world

### Exports

An injection into the circular flow that consists of payments received for goods and services sold to the rest of the world

### Net exports

Payments received for exports minus payments made for imports

### Financial inflow

Purchases of domestic assets by foreign buyers and borrowing from foreign lenders; also often called *capital inflows*

### Financial outflow

Purchases of foreign assets by domestic residents or loans by domestic lenders to foreign borrowers—also often called *capital outflows*

kets that can help keep interest rates low and stimulate private investment. This link between the government budget and private investment does not mean that it is always a mistake for the government to run a deficit. Circumstances when it can prudently do so will be discussed in detail in Chapter 11. However, we can see even from the simple circular flow that the way the government’s budget is managed has important implications for the health of the economy as a whole.

## The Open Economy

We do not live in a closed economy. Our economy has many links, both real and financial, with the rest of the world. By adding these links, Figure 8.3 represents the circular flow model for an **open economy**.

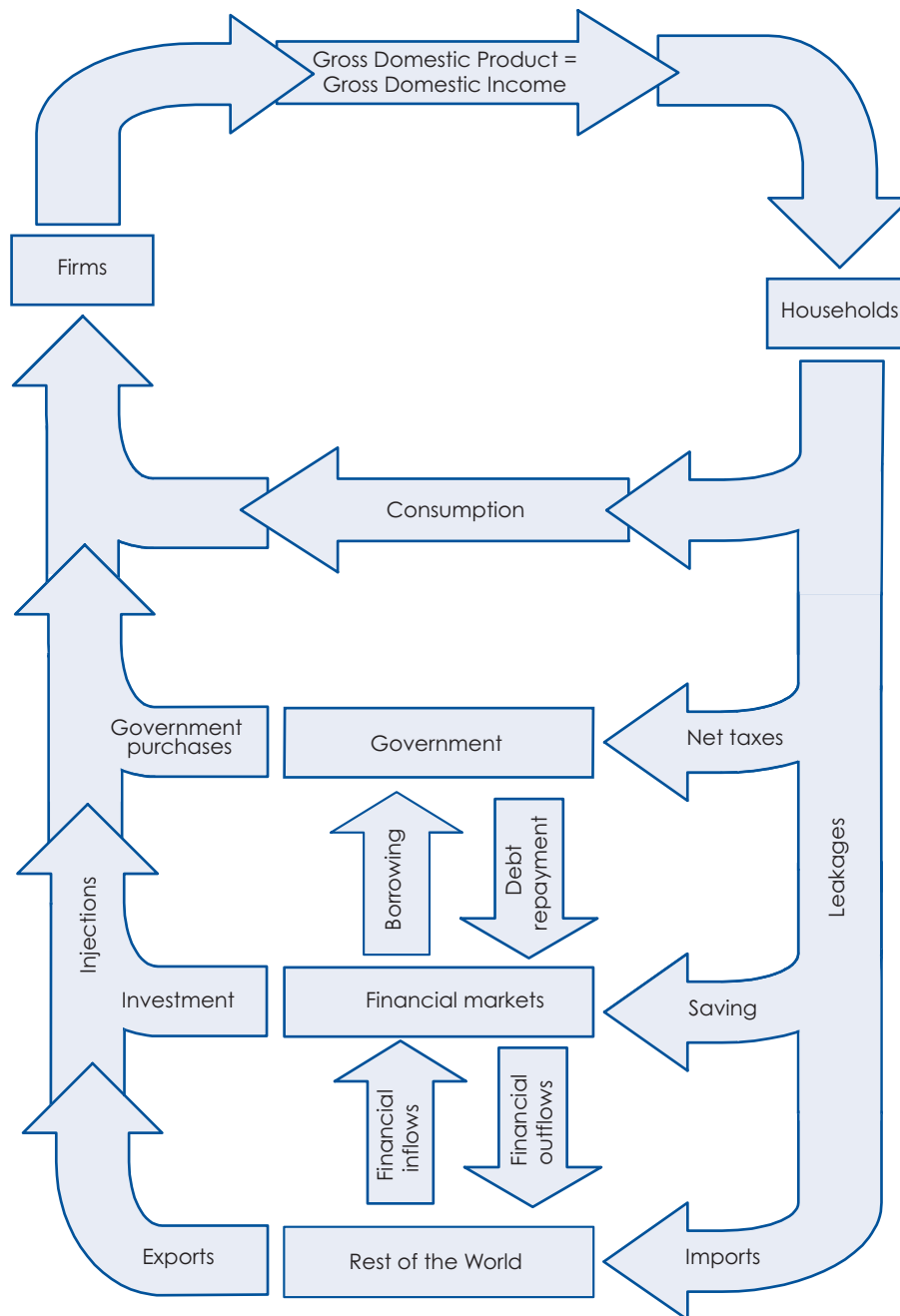
The first link that is added to the circular flow for an open economy is another leakage, **imports**. In everyday life, we are used to thinking of imports as goods flowing into the economy, so it might seem surprising to see imports represented as a leakage, not an injection. However, there is a simple explanation. Remember, the circular flow represents flows of money, not flows of physical objects. The leakage represented by the “imports” arrow could perhaps more accurately be labeled “payments for imports of goods and services.” Then it would be more clearly seen as what it is: The part of household income that is devoted to purchase of goods and services produced in the rest of the world, rather than in the domestic economy.<sup>5</sup>

Figure 8.3 also adds a new injection, **exports**, to match the import leakage. Again, we could more fully describe this item as “payments from the rest of the world for goods and services exported from the domestic economy.” It would then be apparent why an arrow representing an injection of funds into the domestic economy represents “exports”.

The final detail added to Figure 8.3 is a pair of arrows linking the rest of the world to domestic financial markets. Just as government purchases do not always exactly equal net taxes, resulting in a government surplus or deficit, imports do not always exactly equal exports, resulting in a surplus or deficit of payments with the rest of the world. In the context of the circular flow, we call this external surplus or deficit **net exports**, which means exports of goods and services minus imports. In everyday discussions, the term net exports is instead called the *trade surplus* (or the *trade deficit* if imports exceed exports).<sup>6</sup>

If imports exceed exports, where do domestic purchases get the funds they need to buy all the imports? Only part of the imports can be financed by funds received from exports. The balance must come in the form of **financial inflows** from the rest of the world, shown in the diagram by an arrow from the rest of the world to domestic financial markets. The most common forms of financial inflows are borrowing from foreign banks or other lenders, and sales of domestic securities like stocks or bonds to foreign investors. Financial inflows are also often called *capital inflows*.

On the other hand, if exports exceed imports, the opposite question arises: How do foreign buyers afford the exports, since only part of them can be paid for by the payments they receive through the “imports” arrow of the circular flow? The answer is that an export surplus must be financed by **financial outflows**. The most common forms of financial outflows are lending by domestic banks and other financial institutions to foreign borrowers, and purchases of foreign securities like stocks or bonds by domestic investors.

**FIGURE 8.3** CIRCULAR FLOW IN AN OPEN ECONOMY

This version of the circular flow represents an open economy that is linked to the rest of the world through imports (a leakage) and exports (an injection). If imports exceed exports, the excess imports must be financed by a financial inflow from the rest of the world. If exports exceed imports, the resulting trade surplus will be balanced by a financial outflow. As was the case in a closed economy, total injections must equal total leakages ( $S + T + Im = I + G + Ex$ ).

As is the case with government deficits, a country can have financial inflows from some trading partners and financial outflows to others at the same time; thus, both arrows can be in action. From the point of view of the economy as a whole, there will be a net financial inflow whenever net exports are positive, and a net financial outflow whenever net exports are negative.

### *The Balance of Leakages and Injections in an Open Economy*

As was the case with a closed economy, individual pairs of leakages and injections do not have to be equal, but total leakages must equal total injections. In equation form,

$$S + T + \text{Im} = I + G + \text{Ex}$$

It is not possible to explore every possible combination of the way leakages and injections balance, but some important variants are worth mentioning. One possibility is that a country can use a net financial inflow to finance a greater level of domestic investment than would be possible on the basis of domestic saving alone. For example, during much of the nineteenth century, the United States had a persistent trade deficit with Europe and, at the same time, a steady financial inflow that made possible the construction of canals, railroads, and other industrial infrastructure that underpinned the country's rapidly developing economy. More recently, many of the new member states of the European Union are in the same position, with trade deficits and corresponding financial inflows that help finance their economies as they catch up with their wealthier Western European neighbors. In these cases, an external deficit can be a sign of strength, rather than weakness, for an economy.

Another possibility is that a country may use borrowing from abroad not to finance domestic investment but rather to finance a government budget deficit. In terms of the circular flow diagram, such a country would see funds flowing along the arrow from the rest of the world to financial markets, and from there, flowing directly along to the government through sale of government bonds to foreign buyers. A country in this position is said to suffer from the "twin deficit" syndrome. The United States has been in this position, with both government budget deficits and trade deficits, for much of the recent past. The twin deficit issue is examined in more detail in *Applying Economic Ideas 8.1*.

## **The Determinants of Planned Expenditure**

Up to now, we have focused on definitions and relationships, but economic theory is concerned with more than that. To really understand the economy, we need to be able to explain why GDP or other variables have one value rather than another and why they change over time. In order to do that, we need to look at the choices made by consumers, business managers, and other decision makers. This section provides an overview of the choices that affect the various components of GDP. The appendix to this chapter supplements the overview with an optional formal model of planned expenditures.



## Applying Economic Ideas 8.1

### UNDERSTANDING THE TWIN DEFICITS

Over the past 20 years, the government budget and trade deficits of the United States have inspired a great amount of comment and controversy. To understand the many issues raised by these “twin deficits,” it is helpful to interpret them in terms of the equality of leakages and injections. The needed data are shown in the chart.

The upper part of the chart is based on a classification of leakages and injections into three components corresponding to a rearrangement of the terms of the leakages-injection equation in the form  $(Ex - Im) + (G - T) + (I - S) = 0$ .  $G - T$  represents the consolidated federal, state, and local budget deficit, stated as a positive number when government purchases exceed net taxes.  $Ex - Im$  is the trade surplus (net exports), which becomes a negative number when there is a trade deficit. The  $I - S$  component is positive if domestic investment exceeds domestic saving and negative if there is more domestic saving than investment. The lower part of the chart shows saving and investment separately.

Looking at the chart, we see that the trade deficit grew steadily, from less than 1 percent of GDP in 1991 to over 6 percent of GDP by 2005. As we know from our discussion of the circular flow, a trade deficit must be matched by a financial inflow from the rest of the world. This financial inflow can be used either to finance the government budget deficit, to finance extra private investment beyond what can be financed by domestic saving, or some of both. Looking at the chart, we see three periods representing different relationships among the various leakages and injections.

In the early 1990s, there was more domestic saving than investment. The extra saving was enough to finance both

domestic investment and part of the government budget deficit so that the needed financial inflow from the rest of the world, and the associated trade deficit, were small.

During the later 1990s, the government budget swung into surplus. Other things being equal, this could have allowed the United States to finance all of its own investment—and the trade balance could have moved into surplus; but this did not happen. Instead, as the lower part of the chart shows, just at this time the U.S. economy experienced an investment boom, especially in information technology. Simultaneously, private saving fell. The government surplus helped to finance the investment boom but was unable to do so in full, so financial inflows from abroad were still needed.

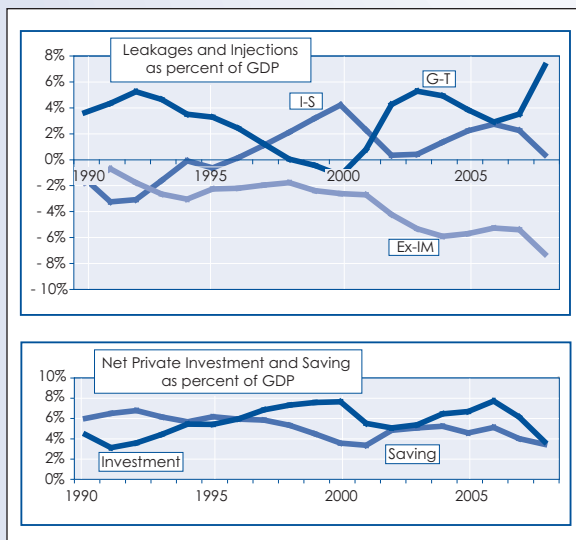
At the end of the 1990s, the high-tech investment boom collapsed; and the economy fell into recession. With incomes falling and transfer payments for unemployment compensation rising, the government budget swung back into deficit. The administration of President George W. Bush decided to use tax cuts to

stimulate spending in order to speed recovery from the recession. Perhaps in part because of the tax cuts, the recession did prove to be a short one, but the economic recovery did not restore the government budget to surplus. Instead, the continued effect of tax cuts, spending to finance the war in Iraq, and other factors pushed the government budget far into deficit. At the same time, investment was rising again—this time with an emphasis on housing rather than information technology. Where was the country to find the funds to finance all of this? Not from domestic saving. Although business saving in the form of retained corporate profits grew strongly, household saving fell to record lows. Total saving thus grew only weakly, not enough even to finance domestic investment let alone the growing budget deficit. That meant that financial inflows from abroad had to finance both the budget deficit and large part of the housing boom.

At the end of 2007, the housing bubble burst; and the U.S. economy moved into a severe recession. Investment fell, closing the gap between investment and domestic saving, but the government budget deficit increased to a record high. By 2008, the economy found itself in the classic “twin deficit” situation in which the government was wholly dependent on financial inflows from the rest of the world to finance its borrowing.



The bursting of the housing bubble sent the economy into a severe recession



SOURCE: Data from *The Economic Report of the President*, 2009. Table B-32. Net government investment included in  $G - T$ . Statistical discrepancy included in  $X - M$ .

## The Components of GDP

Our starting point is the circular flow of income and product shown in Figure 8.3. This time our focus is on the total flow of expenditures on goods and services produced by the economy's business firms. These expenditures consist of consumption (by far the largest component) plus purchases of goods and services by government, purchases of investment goods, and expenditures on exported goods and services. Together, these equal gross domestic product, which in turn, equals gross domestic income.

In moving from the circular flow diagram to our macroeconomic model, however, we need to be careful about one detail. The consumption arrow in the diagram represents consumption expenditures on domestically produced goods. A separate arrow representing the “imports” leakage shows consumption of imported goods. In practice, as we will see in the next chapter, government statisticians do not measure consumption in this way. Instead, the number that they give us in the official national income accounts includes consumption of both domestic and imported consumer goods. The same applies to purchases of imported investment goods by business firms and imported goods used by government. Without adjustment, then, the sum of consumption, investment, government purchases, and exports would overstate expenditures on domestically produced goods and services and, hence, would overstate domestic GDP.

The needed adjustment is, fortunately, very simple. To get an accurate measure of GDP, we simply need to subtract total imports from total measured expenditures. That gives us the following key equation from which we begin construction of our model, in which  $Q$  stands for the total quantity of output, that is, GDP, and the final component,  $Ex - Im$ , represents net exports:

$$Q = C + I + G + (Ex - Im)$$

### Planned Versus Unplanned Expenditure

Earlier in the chapter, we pointed out that investment could be broken down into *fixed investment* and *inventory investment*. Our next step is to divide inventory investment, in turn, into planned and unplanned components. Inventory investment is considered **planned** if the level of inventories is increased (or reduced) on purpose as part of a firm's business plan. For example, a retail store might increase inventories in response to growth in the number of customers it serves or the number of branch stores it constructs. Inventory investment is considered **unplanned** if goods accumulate contrary to a firm's business plan. This happens whenever demand is less than expected so that some goods the firm bought or produced with the intention to sell them, in fact, remain unsold. If demand is greater than expected, so that inventories unexpectedly decrease (or increase at a rate less than scheduled in the business plan), there is negative unplanned inventory investment (disinvestment).

All fixed investment is treated as planned. Total **planned investment**, then, means fixed investment plus planned inventory investment. All other types of expenditure—consumption, government purchases, and net exports—are also considered to be planned. For that reason, we use the term **planned expenditure** to mean the sum of

#### Planned inventory investment

Changes in the level of inventory, made on purpose, as part of a firm's business plan

#### Unplanned inventory investment

Changes in the level of inventory arising from a difference between planned and actual sales

#### Planned investment

The sum of fixed investment and planned inventory investment

#### Planned expenditure

The sum of consumption, government purchases, net exports, and planned investment

consumption, government purchases, net exports, and planned investment. That is shown as the following equation form:

$$E_p = C + I_p + G + (Ex - Im)$$

We can explain the level of planned expenditure, as a whole, by looking at the choices that lie behind each of its components.

## Consumption Expenditure

Choices made by consumers have a more powerful effect on the economy than those made by any other group. Consumer expenditure accounts for about two-thirds of GDP in the United States. In some other countries it is a little more, in some a little less; but everywhere consumption is the largest single component of expenditure. What determines the amount of consumer spending?

Among the first economists to pose this question was John Maynard Keynes (*Who Said It? Who Did It?* 8.1). In his path-breaking book *The General Theory of Employment, Interest, and Money*, he put it this way: “The fundamental psychological law, upon which we are entitled to depend with great confidence ... is that men are disposed, as a rule and on the average, to increase their consumption as their income increases, but not by as much as the increase in their income.”<sup>7</sup> He called the amount of additional consumption, resulting from a one-dollar increase in income, the **marginal propensity to consume**. For example, if your marginal propensity to consume is .75, you will tend to increase your spending by \$750 if your income goes up by \$1,000.

This “psychological law” regarding consumption needs a few qualifications if it is to be stated exactly. First, in place of “income,” we really should say **disposable income**. That means the amount of income left after taxes. If a person in one state earns \$40,000 and pays \$5,000 in taxes, while a person in another state earns \$50,000 and pays taxes of \$15,000, both would have the same disposable income of \$35,000. Other things being equal, we would expect them to spend the same amount on consumption.

Second, the relationship between consumption and disposable income is properly stated in real terms. If both prices and nominal disposable income rise in exact proportion, there is no change in real income; so we would expect no change in real consumption expenditure, other things being equal.

Third, the marginal propensity to consume is not equal to the average obtained by dividing total consumption by total income. Instead, there is a minimum level of consumption that people would like to maintain even if their income were zero. Keynes called this “autonomous consumption.” Intuitively, you can think of the case of a college student who has no income but maintains a minimum level of consumption by borrowing against future income, or an unemployed person who has no income but maintains a minimum level of consumption by drawing on past saving.

Although income is the principal factor that determines consumption spending, there are certain other factors that also can have an effect. Among them are the following:

### Marginal propensity to consume

The proportion of each added dollar of real disposable income that households devote to consumption

### Disposable income

Income minus taxes



## Who Said It? Who Did It? 8.1

## JOHN MAYNARD KEYNES: THE GENERAL THEORY

John Maynard Keynes was born into economics. His father, John Neville Keynes, was a lecturer in economics and logic at Cambridge University. John Maynard Keynes began his own studies at Cambridge in mathematics and philosophy. However, his abilities so impressed Alfred Marshall that the distinguished teacher urged him to concentrate on economics. In 1908, after Keynes had finished his studies and done a brief stint in the civil service, Marshall offered him a lectureship in economics at Cambridge; Keynes accepted.



John Maynard Keynes

Keynes is best remembered for his 1936 work, *The General Theory of Employment, Interest, and Money*, a book that many still see as the foundation of what is today called macroeconomics. Although this was by no means Keynes's first major work, it was the basis for his reputation as the outstanding economist of his generation. Its major features are a bold theory based on broad macroeconomic aggregates and a strong argument for activist and interventionist policies.

Keynes was interested in more than economics. He was an honored member not only of Britain's academic

upper class but also of the nation's highest financial, political, diplomatic, administrative, and even artistic circles. He had close ties to the colorful "Bloomsbury set" of London's literary world. He was a friend of Virginia Woolf, E. M. Forster, and Lytton Strachey; and in 1925 he married ballerina Lydia Lopokovia. He was a dazzling success at whatever he turned his hand to, from mountain climbing to financial speculation. As a speculator, he made a huge fortune for himself; and as bursar of Kings College, he built an endowment of 30,000 pounds into one of over 380,000 pounds.

In *The General Theory*, Keynes wrote:

*The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back. ... There are not many who are influenced by new theories after they are 25 or 30 years of age, so that the ideas which civil servants and politicians and even agitators apply to current events are not likely to be the newest.*

Was Keynes issuing a warning here? Whether or not he had any such thing in mind, his words are ironic because he himself has become one of those economists whose ideas remain influential long after they were first articulated.

- Changes in net taxes (either taxes paid or transfer payments received), which act by changing the amount of disposable income associated with a given total income
- Changes in consumer wealth, that is, the accumulated value of assets a person owns, is considered apart from current income—One very important example concerns the value of housing, since a home is the biggest asset for many households. In a period when housing prices rise more rapidly than income, as happened in the United States in the early 2000s, consumer spending rises more in proportion to income than it otherwise would.
- Interest rates—If interest rates fall, people can borrow more cheaply and may buy more goods and services on credit. Also, the amount they have to pay in interest on credit cards, mortgages, and other debt decreases, leaving more to buy consumer goods.

- Consumer confidence—In periods when consumers feel secure about their jobs and expect their incomes to rise in line with general prosperity, they tend to spend more for any given level of income. In times of pessimism and insecurity, people tend to be cautious and increase their saving as protection against the expected rainy day.

### Planned Investment

The second component of planned expenditure is planned investment. It depends on two principal factors.

First, planned investment depends on interest rates (more specifically, on real interest rates, that is, interest rates adjusted for inflation, as explained in Chapter 7). The relationship between interest rates and investment is easiest to understand in the case of a business that needs to borrow in order to invest. Suppose you run a construction business, and you are thinking about improving the productivity of your workers by buying a new backhoe, which costs \$50,000. Your banker is willing to lend you the money, but you will have to pay 6 percent per year interest, equivalent to \$250 per month on the loan of \$50,000. If the bank charged 12 percent interest, your monthly interest payments would rise to \$500; and you would be less likely to buy the new machine. If the interest rate was just 3 percent, monthly interest payments would be only \$125; and you would be more likely to make the investment.

Although it is not so obvious, interest rates also play a role in investment decisions for a company that plans to finance investment from its own retained profits. Suppose that as a result of good profits in the previous year, your construction company had put aside \$100,000 in cash. You would not then have to borrow from the bank to buy the backhoe. However, using half of your cash reserves to buy the backhoe still has an opportunity cost that depends on interest rates. For example, if the rate of interest on government bonds is 6 percent, your company could earn \$250 per month by using \$50,000 of your cash reserves to buy bonds instead of buying the backhoe.<sup>8</sup> That is an opportunity cost. If the interest rate were 12 percent per year, your monthly income from the bonds would be \$500—a greater opportunity cost—and you would be more tempted to buy the bonds instead of the backhoe.

Interest rates influence investment decisions by consumers as well as business. Residential construction accounts for about a third of all private fixed investment in the United States. When mortgage interest rates are low, as they were in the early 2000s, housing construction booms.

The importance of interest rates for investment spending is one of the reasons that we will spend several chapters in this book talking about banking, financial markets, and related topics.

Interest rates are not the only factor influencing investment decisions. The psychological factor of *business confidence* is also important. By this, we mean the whole complex of expectations and hopes on which firms make their plans for the future. If

you expect a boom in the housing market in your area, your construction company is more likely than otherwise to buy that backhoe. If you expect doom and gloom ahead, you'll play it safe by buying the government bonds. Keynes referred to business confidence using the colorful term “animal spirits.” In doing so, he wanted to emphasize the fact that business confidence can change quickly for reasons that are hard for economists to measure exactly.

On a global scale, the decision of how much to invest in a given country depends on the country's *investment climate*, as well as interest rates. Among the conditions that make up a country's investment climate are its tax laws, the amount of “red tape” imposed by the country's bureaucracy, the likelihood that profits will be drained away by criminal gangs or corrupt officials, and the stability of macroeconomic conditions. In countries where the investment climate is good, domestic firms are willing to put profits into expansion of their operations, and international firms are willing to bring in new capital and know-how. In countries where the investment climate is bad, domestic firms send their profits abroad for safekeeping rather than investing them at home, and global business stays away.

## Government Purchases

Government purchases are considered to be **exogenous** in most simple macroeconomic models, including the one outlined in the appendix to this chapter. This means that they are determined by politics or other considerations that lie outside the model rather than by any variables that are included in the model. Transfer payments and tax revenues, on the other hand, are **endogenous** in that they depend on the level of real GDP, a variable that is included in the model. During the expansion phase of the business cycle, tax revenues rise and transfer payments, especially for unemployment benefits, fall. During a recession, tax collections fall and transfer payments rise.

Chapter 12 will take a closer look at the determination of government purchases and net taxes.

### Exogenous

Term applied to any variable that is determined by noneconomic considerations, or by economic considerations that lie outside the scope of a given model

### Endogenous

Term applied to any variable that is determined by other variables included in an economic model

## Net Exports

The variable *net exports* is endogenous because it also depends on real GDP. As real GDP increases, both consumers and businesses spend some of their increased income on imported goods. For this reason, net exports tend to fall, and a country's trade deficit tends to widen during the expansion phase of the business cycle.

The exchange rate of a country's currency relative to the currencies of its trading partners is another factor that affects net exports. For example, during the early 2000s, the U.S. dollar weakened relative to the euro, the currency used by the country's major European trading partners. As the dollar weakened, it became easier for U.S. firms to sell their exports in Europe; and, at the same time, imports from Europe became more expensive for U.S. buyers. Consequently, net exports to Europe strengthened. Exchange rates, in turn, are influenced by many factors, including changes in real GDP, inflation, and interest rates. The complex interaction between net exports and other economic variables will be explored in several coming chapters.

## Equilibrium in the Circular Flow

In Chapter 2, we introduced the concept of market equilibrium. The market for any single good, say chicken, is said to be in equilibrium when the amount buyers plan to purchase equals the amount that producers supply for sale. When the market for chicken is in equilibrium, there will be no tendency for accumulation or decrease of inventories and no immediate pressure for market participants to change their plans.

The idea of equilibrium as a situation in which there is no unplanned change in inventories can be extended to the circular flow of income and expenditure. When total planned expenditures (consumption plus planned investment plus government purchases plus net exports) equal GDP, total planned purchases will equal total production; and there will be no unplanned inventory change for the economy as a whole. As a result, there will be no pressure from unplanned inventory change to cause changes in production plans. If something happens to increase or decrease total planned expenditures, the equilibrium will be disrupted. Let's see how this process works out as the economy expands and contracts over the business cycle.

### *An Expansion of Planned Expenditure*

Suppose that the circular flow is initially in equilibrium with total planned expenditure exactly equal to GDP. Since goods are being produced at just the rate they are being sold, the level of inventories remains constant from one month to the next. Now suppose that something happens to disturb this equilibrium. For example, suppose that development of new energy-efficient technologies causes an upturn in investment as firms replace obsolete, energy-wasting equipment. As equipment makers increase their output of goods to satisfy the increased investment demand, they will take on more workers. The wage component of national income will increase. Profits of equipment makers are also likely to increase, further adding to the expansion of national income.

From our earlier discussion, we know that when incomes rise, households will increase their consumption expenditure. So far there has been no change in the output of consumer goods; so as consumption expenditure begins to increase, the first effect will be an unplanned decrease in inventories. Only then, when makers of consumer goods see inventories falling, will they modify their production plans to meet the new demand. As they do so, they too will need to hire new workers; and incomes will rise further.

In this way, the original economic stimulus, which began in the industrial equipment sector, spreads through the economy. GDP and domestic income continue to rise, but not without limit. According to the principle of the marginal propensity to consume, people spend only a part of any increase in income on consumer goods, and each round of the cycle of more-production-more-income-more-spending is smaller than the previous one. Before long, GDP reaches a new equilibrium where production and planned expenditure balance, and there are no further unplanned changes in inventories.

Recall that the whole process began with an assumed increase in planned investment. By the time the new equilibrium is reached, the total change in GDP will be greater than

the original increase in planned investment because it will also include production of additional consumer goods. The principle that a given initial change in planned expenditure changes equilibrium GDP by a greater amount is known as the multiplier effect. The appendix to this chapter explains the multiplier effect in more detail.

### A Contraction of Planned Expenditure

The same process operates in reverse if equilibrium is disturbed by a decrease in some category of planned expenditure. For example, suppose a crisis in the Mexican economy reduces U.S. exports to that country. The first effect will be that U.S. makers of export goods will find inventories rising because Mexican importers are not buying as much as they had planned before the crisis. To bring inventories in line with reduced sales, U.S. makers of export goods cut their output. Workers are laid off or work shorter hours, and their incomes fall. As a result, they cut back on consumption expenditures, following the principle of the marginal propensity to consume. When this happens, makers of consumer goods also find that their inventories unexpectedly increase. They, too, cut back on output, and incomes of their workers fall.

As this process continues, GDP and domestic income decrease. They do not decrease without limit, however. Before long a new equilibrium is reached. In the new equilibrium, real GDP will have decreased by a greater amount than the original change in exports. This is an example of the multiplier effect operating in reverse.

### The Multiplier Effect and the Business Cycle

The **multiplier effect** was one of the key ideas in Keynes' *General Theory*. Coming at the height of the Great Depression, the multiplier effect was immediately seized upon as an explanation for the business cycle.

Reduced to its simplest form, the Keynesian explanation of the Great Depression went something like this. During the 1920s, the U.S. economy entered a boom due to the multiplier effect of huge investment expenditures, especially expansion of automobile production and road building. Then, in 1929, came the Black Friday stock market crash. The crash destroyed business confidence, and investment fell. This time the multiplier effect operated in reverse to produce the Great Depression.

At the same time the multiplier effect seemed to give an explanation of the causes of the Great Depression, it also seemed to suggest a cure. What if the government increased its purchases of goods and services by enough to offset the drop in private investment? Wouldn't this send equilibrium GDP back to its original level? This reasoning gave rise to various attempts to spend the country back to prosperity, for example, by hiring thousands of unemployed workers for service in national parks. The nation did not fully recover from the Great Depression until the start of World War II brought on a further surge in government purchases.

Modern macroeconomics makes a place for the multiplier effect and recognizes that there is an element of truth in the simple Keynesian view of the business cycle. However, the simple multiplier theory is seriously incomplete. One shortcoming concerns changes in the price level over the business cycle. When producers respond to

#### **Multiplier effect**

The tendency of a given exogenous change in planned expenditure to increase equilibrium GDP by a greater amount

an unexpected decrease in inventories, do they increase real output without changing prices, do they raise prices to take advantage of unexpectedly strong demand, or do they do a little of both? Another problem is that the simple multiplier theory does not consider capacity constraints related to labor inputs, capital, and technology. Does real output respond in the same way to a change in planned expenditure when the economy is operating above its natural level of real output as below it? Still another limitation is that the theory pays too little attention to the role of money and the financial sector. Later chapters will deal with all of these issues in order to give a more complete picture.



## Summary

- How are households and firms linked by incomes and expenditures?** In order to produce goods and services, firms pay wages and salaries to obtain labor inputs, interest to obtain capital, and rents and royalties to obtain natural resources. If sales exceed costs, firms earn profits. The sum of wages, salaries, interest, rents, royalties, and profits constitute domestic income.
- What are the relationships between injections and leakages in the circular flow?** Saving, net taxes (tax revenues minus transfer payments), and imports are leakages from the circular flow. Investment, government purchases, and exports are injections. The total of leakages must always equal the total of injections; however, the individual pairs (saving and investment, net taxes and government purchases, imports and exports) do not need to balance. Any imbalance in the individual pairs is balanced by flows of funds through the financial sector.
- How is expenditure divided into consumption, investment, government purchases, and net exports?** The largest part of domestic income is used to purchase consumer goods and services. Some also is used to buy newly produced capital goods or add to inventories (investment), to pay for goods and services purchased by government, or to buy imported goods. Foreign buyers also make some expenditure. The term net exports refers to exports minus imports.
- Why is some investment planned and other unplanned?** *Planned investment* means fixed investment (purchases of newly produced capital goods) plus *planned inventory investment* (changes in inventory made on purpose as part of a business plan). In addition, inventories may change unexpectedly in ways not called for by firms' business plans. These changes are called *unplanned inventory investment*.
- How can the concept of equilibrium be applied to the circular flow of income and expenditure?** The *circular flow of income and product* is in equilibrium when total planned expenditure equals GDP. If *planned expenditure* exceeds GDP, so that more goods and services are being bought than are being produced, there will be unplanned decreases in inventories. In reaction, firms will increase output, and GDP will tend to rise. If total planned expenditure falls short of GDP, there will be unplanned increases in inventories. In response, firms will tend to decrease their output and GDP will fall.
- What is the multiplier effect and how is it related to the business cycle?** According to the multiplier effect, a given change in one type of expenditure (say, planned investment) will produce a larger change in equilibrium GDP.

The multiplier effect helps explain how relatively small disturbances in expenditure can cause relatively larger changes in GDP over the course of the business cycle.

## Key Terms

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Gross domestic income (domestic income)	252
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## Problems and Topics for Discussion

- Your personal expenditures** What was your income last month (or last year) from all current resources, including wages and salaries plus any interest earned or other investment income? Do not count money that you received as transfer payments, such as government benefits, gifts from family, scholarship grants, and so on. How much was your saving? Did you add to your savings or draw down on past savings? How much did you spend on consumer goods or services? Of your spending, approximately how much do you think was spent on imported goods or services purchased while on foreign travel? Identify where the answer to each of these questions appears in the circular flow diagram, Figure 8.3.
- Planned versus unplanned inventory changes.** Suppose your school bookstore manager learns from the admissions office that enrollment of students will rise by 10 percent next year. What planned inventory investments would the bookstore manager make? Suppose that a storm delays the departure of 100 students from another university who have visited your campus for a hockey game. While waiting for their buses to leave, they decide to browse your school bookstore and buy some items that catch their eye. How would this affect the store's inventories?
- Injections and leakages in the Russian economy** In recent years, Russia has benefited from high world prices for the large amount of oil it produces for export. As a result, Russia has had positive net exports. Because oil is partly state owned and heavily taxed where privately owned, government tax revenues have increased so that the Russian government budget is in surplus. How would these differences between the Russian and U.S. economies affect the direction of the arrows in the circular flow diagram of Figure 8.3? Explain any changes that would need to be made.

4. **Unplanned inventory change and disequilibrium** Suppose that you read in the news that inventories in retail stores fell last month, to the surprise of analysts. Would you interpret this as a sign of equilibrium or disequilibrium in the circular flow? Which do you think would be more likely in the coming months, an increase or a decrease in GDP? Why?
5. **Adjustment to change in planned expenditure.** Starting from a state of equilibrium, trace the effects of each of the following. What happens to inventories? How do firms react? What happens to incomes? To consumption expenditure? To GDP?
- Business managers, anticipating future profit opportunities in consumer electronics, increase orders for production equipment in order to prepare for the expected increase in demand.
  - The federal government reduces income tax rates.
  - Good harvests in Africa reduce the demand for exports of U.S. farm products.

## Case for Discussion

### *Excerpts from the Annual Report of the President's Council of Economic Advisers, 2007*

The expansion of the U.S. economy continued for the fifth consecutive year in 2006. Economic growth was strong, with real gross domestic product (GDP) growing at 3.4 percent during the four quarters of 2006.

Consumer spending sustained its strong growth during the four quarters of 2006 (rising 3.7 percent in real terms), continuing its 15-year pattern of rising faster than disposable income. As a result, the personal saving rate fell to a negative 1.0 percent for the year as a whole—its lowest annual level during the post-World War II era. Corporate net saving rose to 3.8 percent of

gross domestic income (GDI) during the first three quarters of 2006, its highest level since the 1960s.

During 2006, real business investment in equipment and software grew 5 percent, slower than the 7 percent average pace during the 3 previous years. Its fastest-growing components included computers, as well as machinery in the agricultural and service sectors. Investment in mining and oil field machinery was also strong, likely in response to elevated crude oil prices and to the need to replace Gulf of Mexico facilities damaged by the 2005 hurricanes.

Inventory investment was fairly steady during 2006 and had only a minor influence on quarter-to-quarter fluctuations. Real nonfarm inventories grew at an average \$44 billion annual pace during 2006, a 3.0 percent rate of growth that is roughly in line with the pace of real GDP growth over the same period.

Real Federal purchases of goods and services grew 2.4 percent during 2006. This was the third consecutive year of growth at roughly 2 percent. Defense spending accounted for all of the increase during the four-quarter period, while non-defense purchases fell. Nominal Federal revenues grew 15 percent in FY 2005 and 12 percent in FY 2006. These rapid growth rates exceeded growth in outlays and GDP as a whole; and the U.S. fiscal deficit, as a share of GDP, shrank from 3.6 percent in FY 2004 to 2.6 percent in FY 2005 to 1.9 percent in FY 2006.

The current account deficit (the excess of imports and income flows to foreigners over exports and foreign income of Americans) jumped to 7.0 percent of GDP in the fourth quarter of 2005, partly due to petroleum imports that replaced lost Gulf of Mexico production. The current account deficit then retraced some of its earlier increase in the first three quarters of 2006, when oil imports declined.

## QUESTIONS

- Why is growth of consumer spending considered a positive factor for expansion of GDP, even when personal saving is falling to a negative level? Are the long-term and short-term effects

of a negative personal saving rate both favorable to economic growth? Discuss, based on concepts from this chapter and the preceding one.

2. According to the report, inventories grew at about the same rate as the economy as a whole. Taken in isolation from other things going on in the macroeconomy, would you expect this behavior of inventories to bias the economy toward faster expansion in the near future, bias it toward a slowdown in the near future, or to be roughly neutral in its effect?
3. According to the report, exports grew faster than imports during the first part of the year. Would you expect this to have a positive or a negative effect on future economic growth? Why?
4. The government budget remained in deficit during 2006. What information given here helps understand how the deficit was financed?

## End Notes

1. Economists use the term *households* to refer to families who live together and make economic decisions together about issues of work and spending, as well as to individuals living alone who make such decisions independently.
2. Some minor qualifications of this statement will be made in the next chapter.
3. There are two different ways to represent the government surplus or deficit in equation form. For purposes of the macroeconomic models in this text, we usually write the government's budget equation this way: surplus = net taxes – government purchases. If the budget is in deficit “surplus” has a negative value. In other contexts, the surplus or deficit may be represented this way: surplus = tax revenue – government expenditure. Because the item “transfer payments” is subtracted from tax revenue to give net taxes, and is added to government purchases to give government expenditure, it is clear that the two ways of representing the surplus or deficit always give the same result.
4. Figure 8.3 is drawn as if the only imports were imports of consumer goods purchased by households. In practice, business firms purchase some imported capital goods as part of their investment spending, and the government also purchases some imported goods and services. At the risk of making the circular flow diagram too complex to read easily, we could, in principle, draw in additional small arrows to represent flows of payments for imported capital goods and government purchases.
5. The term *trade deficit* as popularly used does not always correspond exactly to our term *net exports*. The next chapter will discuss concepts related to imports, exports, and the balance of payments in more detail.
6. The economy's financial sector, including banks, securities markets, insurance companies, and other institutions will be discussed in more detail in Chapter 15.
7. John Maynard Keynes, *The General Theory of Employment, Interest, and Money* (New York: Harcourt, Brace and World, 1936), 96.
8. To understand this example, it is important to remember that buying the backhoe is a purchase of newly produced capital goods, that is, part of the fixed investment component of planned expenditure. Buying the government bond is a financial investment, a purchase of the right to receive future payments from the government. The bonds are not newly produced capital goods and do not count as part of GDP.



## Appendix to Chapter 8: THE MULTIPLIER EFFECT



The expenditure multiplier can be calculated using this formula:

$$\text{spending multiplier} = \frac{1}{1 - MPC}$$

where MPC = Marginal Propensity to Consume

For example, if the MPC = 0.75, this indicates a consumer has a tendency to spend 75 cents out of each additional dollar earned. With an MPC = 0.75, the spending multiplier equals 4.

$$\text{spending multiplier} = \frac{1}{1 - 0.75} = \frac{1}{0.25} = 4$$

Using this multiplier, an initial increase in government spending of one dollar will result in an expansion of total spending by four dollars. Thus, a \$100 billion increase in government spending would multiply throughout the economy for a total increase in spending of \$400 billion. This result can be found by using the following equation.

$$\text{Change in GDP} = \text{Change in Government Spending} \times \text{spending multiplier}$$

Thus, \$400 billion = \$100 X 4

Expansionary and contractionary fiscal policy could also take the form of changes in taxes or transfer payments. In such cases, the multiplier is

$$\text{Tax Multiplier} = \frac{-MPC}{1 - MPC}$$

$$\text{Transfer Payment Multiplier} = \frac{MPC}{1 - MPC}$$

Thus, if the MPC = 0.75, then the tax multiplier equals -three and the transfer payment multiplier equals +three. Using this multiplier, an initial increase in taxes by \$100 billion would multiply throughout the economy for a total decrease in spending by \$300 billion. A \$100 billion increase in transfer payments will result in a \$300 billion increase in spending.

A formula similar to the one noted above can be used to predict changes in GDP resulting from changes in taxes and transfer payments. For example, a change in GDP resulting from a change in taxes can be predicted using this formula.

$$\text{Change in GDP} = \text{Change in Taxes} \times \text{Tax Multiplier.}$$

Using the example above, \$300 = \$100 X -3 = -\$300 billion

Note the negative sign in the tax multiplier. This indicates that an increase in taxes will result in a decrease in spending. Similarly, the positive sign of both the spending multiplier and the transfer payment multiplier indicate that an increase in government spending, either directly through an increase in government purchases, or indirectly through increased transfer payments, results in an increase in total spending in the economy.