chapter 9

>> Savings, Investment Spending, and the Financial System

A HOLE IN THE GROUND

Between 1987 and 1994, a large international group of private investors threw $15 billion into a hole in the ground. But this was no ordinary hole: it was the Channel Tunnel, popularly known as the Chunnel. Engineers had dreamed for centuries about linking Britain directly to France so that travelers would no longer have to cross the often-stormy seas of the English Channel. The Chunnel fulfills that dream, allowing passengers to take a comfortable fast train (and ship their cars, too) underneath the 31-mile-wide strait.

Everyone agrees that the Chunnel is a big improvement on the previously available alternatives. It's much faster than taking a ferry. Even flying from London to Paris can easily be an all-day affair, what with getting to and from the airports and air traffic delays. The *Eurostar,* the express train through the Chunnel, gets you from downtown London to downtown Paris in three hours.

How could such a massive investment be financed? The French and British governments could have built the Chunnel but chose to leave it to private initiative. Yet the size of the required investment was beyond the means of any individual. So how was the money raised?

The answer: the Eurotunnel Corporation, the company formed to build the Chunnel, was able to turn to the financial markets. It raised $4 billion by selling stock to thousands of people, who then became part-owners of the Chunnel, and an additional $12 billion through bank loans. Raising this much money was an incredible feat, in a way as incredible as the engineering required for in the construction of the Chunnel.

What you will learn in this chapter:

- The relationship between savings and investment spending
- Aspects of the **loanable funds market,** which shows how savers are matched with borrowers
- The purpose of the four principal types of **financial assets:** stocks, bonds, **loans,** and **bank deposits**
- How **financial intermediaries** help investors achieve **diversification**
- Some competing views of what determines stock prices and why stock market fluctuations can be a source of macroeconomic instability

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A quick and luxurious ride from London to Paris beneath the English Channel was made possible by the savings of millions of people.

Yet modern economies do this sort of thing all the time. The long-run growth we analyzed in Chapter 8 depends crucially on a set of markets and institutions, collectively known as the *financial system,* that channels the funds of savers into productive investment spending. Without this system, businesses would not be able to purchase much of the physical capital that is such an important source of productivity growth. And savers would be forced to accept a lower return on their funds. Historically, financial systems channeled funds into investment projects such as railroads, factories, electrification, and so on. Today, financial systems channel funds into sources of growth such as telecommunications, advanced technology, and investments in human capital. Without a well-functioning financial system, a country will suffer stunted economic growth.

In this chapter, we begin by focusing on the economy as a whole. We examine the relationship between savings and investment spending at the macroeconomic level. Next, we go behind this relationship and analyze the financial system, the means by which savings is transformed into investment spending. We'll see how the financial system works by creating assets, markets, and institutions that increase the welfare of both savers (those with funds to invest) and borrowers (those with investment projects to finance). Finally, we close by examining the behavior of financial markets and why that behavior often resists economists' attempts to explain it.

Matching Up Savings and Investment Spending

We learned in Chapter 8 that two of the essential ingredients in economic growth are increases in the economy's levels of *human capital* and *physical capital*. Human capital is largely provided by government through public education. (In countries with a large private education sector, like the United States, private post-secondary education is also an important source of human capital.) But physical capital, with the exception of infrastructure, is mainly created through private investment spending—that is, spending by firms rather than by the government.

Investment spending must be financed out of savings. There are two sources of savings. One source is domestic savings, created by a country's own residents. The second source is foreign savings, generated by foreigners. We'll begin with the simplest case, a *closed economy*—an economy in which there is no economic interaction with the rest of the world. There are no exports, no imports, and no capital flows. In a closed economy, the second source of acquiring savings is unavailable; so, all investment spending must come from domestic savings. However, modern economies aren't closed. So we'll follow with a discussion of an *open economy*—an economy in which there is economic interaction with the rest of the world. In an open economy, both sources of investment funds—domestic savings and foreign savings—are available.

In both a closed and an open economy, our first step in understanding the process of investment spending is to clarify the relationship between savings and investment spending. Then we can look at how savings is allocated among various investment spending projects available in the economy.

PITFALLS

INVESTMENT VS. INVESTMENT SPENDING

When macroeconomists use the term *investment spending,* they almost always mean "spending on physical capital." This can be confusing, because in ordinary life we often say that someone who buys stocks or purchases a building is "investing." The important point to keep in mind is that only spending that adds to the economy's stock of physical capital is "investment spending". In contrast, the act of purchasing an asset such as stocks, bonds, or existing real estate is "making an investment."

The Savings–Investment Spending Identity

The most basic point to understand about savings and investment spending is that they are always equal, regardless of whether an economy is open or closed. This is not a theory; it's a fact of accounting called the **savings–investment spending identity.**

According to the **savings–investment spending identity,** savings and investment spending are always equal for the economy as a whole.

To see why the savings–investment spending identity must be true, let's look again at the national income accounting that we examined in Chapter 7. Recall that GDP is equal to total spending on final goods and services produced in the economy and that we can write the following equation:

(9-1) $\text{GDP} = C + I + G + X - IM$

where C is spending by consumers, I is investment spending, G is government purchases of goods and services, X is the value of exports to other countries, and IM is spending on imports from other countries.

The Savings–Investment Spending Identity in a Closed Economy In a closed economy, there are no exports or imports. So $X = 0$ and $IM = 0$, which makes Equation 9-1 simpler:

(9-2) $\text{GDP} = C + I + G$

Let's rearrange Equation 9-2, putting investment spending on one side and everything else on the other. It looks like this:

(9-3) $I = \text{GDP} - C - G$

That is, investment spending is equal to GDP minus consumer spending minus government purchases of goods and services in a closed economy.

Now let's derive savings for the total economy. We know from Chapter 7 that private savings is equal to disposable income (household income, including government transfers, net of taxes) minus consumer spending:

(9-4) $S_{Private} = \text{GDP} + TR - T - C$

where $S_{Private}$ is private savings, TR is government transfers, and T is taxes paid.

But households are not the only parties that can save in an economy. In any given year the government can save, too, if it collects more tax revenue than it spends. When this occurs, the difference is called a **budget surplus** and is equivalent to savings by government. If, alternatively, government spending exceeds tax revenue, there is a **budget deficit**—a negative surplus. In this case we often say that the government is "dissaving": by spending more than its tax revenues, the government is engaged in the opposite of saving. We'll define the term **budget balance,** $S_{Government}$, to refer to both cases, with the understanding that the budget balance can be positive (a budget surplus) or negative (a budget deficit). Then we have:

(9-5) $S_{Government} = T - TR - G$

The **budget surplus** is the difference between tax revenue and government spending when tax revenue exceeds government spending.

The **budget deficit** is the difference between tax revenue and government spending when government spending exceeds tax revenue.

The **budget balance** is the difference between tax revenue and government spending.

National savings, the sum of private savings plus the budget balance, is the total amount of savings generated within the economy.

In general, as we'll see in Chapter 12, responsible governments run deficits when faced with difficult times, such as wars or recessions, then run surpluses later to pay off the debt incurred during those deficit periods.

Putting together Equations 9-4 and 9-5 we arrive at an expression for total savings generated within the economy as a whole, called **national savings,** or NS:

(9-6) $NS = S_{Private} + S_{Government}$

$= (\text{GDP} + TR - T - C) + (T - TR - G)$

$= \text{GDP} - C - G$

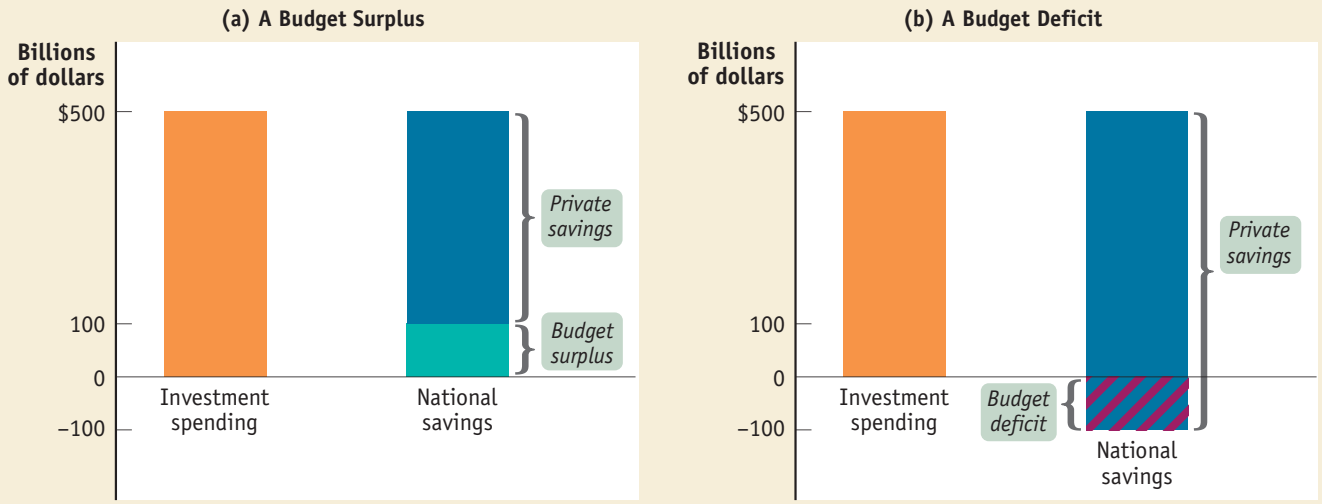
At this point we can see that the right-hand sides of Equations 9-3 and 9-6 are identical. Combining these two equations brings us to our final step in showing the savings–investment spending identity in a closed economy:

(9-7) $I = NS$

or

Investment spending = *National savings* in a closed economy

Figure 9-1 The Savings–Investment Spending Identity in a Closed Economy



Panel (a) illustrates a budget surplus. Total investment spending is assumed to be $500 billion, $400 billion of which is financed by private savings. The remaining $100 billion comes from the budget surplus. Panel (b), in contrast, shows a budget deficit of $100 billion, represented by the area below the horizontal axis. The budget deficit has absorbed part of private savings, which must now be $200 billion greater than it had been—$600 billion—in order for total savings to provide $500 billion in investment spending for this economy.

So the closed-economy version of the savings–investment spending identity is that investment spending is always equal to national savings.

Figure 9-1 illustrates how this works by considering a hypothetical closed economy, where we have broken national savings, *NS*, into its two components, $S_{Private}$, private savings, and $S_{Government}$, the budget balance (a budget surplus or deficit, as the case may be). In each panel, the height of the bar on the left represents the amount of investment spending, *I*, which is $500 billion. Because national savings equals investment spending in a closed economy, the bar representing investment spending must be matched by the height of the bar on the right, which represents national savings, *NS*. In panel (a), we show an economy in which the government runs a budget surplus of $100 billion and private savings is equal to $400 billion. The areas representing private savings and the budget surplus are stacked to create the overall pool of national savings of $500 billion, which is available for investment spending. In panel (b), we show an economy in which the government runs a budget deficit of $100 billion, represented by the area below the horizontal axis. Here part of private savings has been offset by the budget deficit. As a result, private savings must now be $200 billion greater than before—$600 billion—in order for national savings to provide $500 billion in investment spending for this economy.

We've just learned that investment spending in a closed economy is equal to national savings; that is, investment spending is equal to private savings plus the budget balance, the government's contribution to savings or dissavings, as the case may be. Now we'll examine the savings–investment spending identity when the economy is open.

The Savings–Investment Spending Identity in an Open Economy An *open economy* is an economy in which goods and money can flow into and out of the country. This changes the savings–investment spending identity because savings need not be spent on physical capital located in the same country in which the savings are

generated. That's because the savings of people who live in any one country can be used to finance investment spending that takes place in other countries. So any given country can receive *inflows* of funds—foreign savings that finance investment spending in the country. Any given country can also generate *outflows* of funds—domestic savings that finance investment spending in another country.

Capital inflow is net inflow of funds into a country.

The net effect of international inflows and outflows of funds on the total savings available for investment spending in any given country is known as the **capital inflow** into that country. It is the net inflow of funds into a country, which is equal to the total inflow of foreign funds minus the total outflow of domestic funds to other countries. We'll denote a country's capital inflow by the symbol *KI*. Like the budget balance, a capital inflow can be negative—that is, more capital can flow out of a country than flows into it. In recent years the United States has experienced a consistent inflow of capital from foreigners, who view our economy as an attractive place to put their savings. In 2004, for example, capital inflows into the United States exceeded $600 billion.

PITFALLS

THE DIFFERENT KINDS OF CAPITAL

It's important to understand clearly the three different kinds of capital: physical capital, human capital, and financial capital. As we explained in Chapter 8, physical capital consists of manufactured resources such as buildings and machines; human capital is the improvement in the labor force generated by education and knowledge. Financial capital—usually referred to simply as "capital" in macroeconomics—is funds from savings that are available for investment spending. So a country that has a "capital inflow" is experiencing a flow of funds into the country from abroad for the purpose of investment spending.

It's important to note that, from a national perspective, a dollar generated by national savings and a dollar generated by capital inflow are not equivalent. Yes, they can both finance the same dollar's worth of investment spending. But any dollar borrowed from a saver must eventually be repaid with interest. A dollar that comes from national savings is repaid with interest to someone domestically—either a private party or the government. But a dollar that comes as capital inflow must be repaid with interest to a foreigner. So a dollar of investment spending financed by a capital inflow comes at a higher *national* cost—the interest that must eventually be paid to a foreigner—than a dollar of investment spending financed by national savings.

The fact that a net capital inflow represents funds borrowed from foreigners is an important aspect of the savings–investment spending identity in an open economy. Consider an individual who spends more than his or her income; that person must borrow the difference from others. Similarly, a country that spends more on imports than it earns from exports must borrow the difference from foreigners. And that difference, the amount of funds borrowed from foreigners, is equal to the country's capital inflow. As we will explain at greater length in Chapter 19, this means that the capital inflow into a country is equal to the difference between imports and exports:

$$\textbf{(9-8)} \quad KI = IM - X$$

We can now go back to Equation 9-1 to derive the savings–investment spending identity for an open economy. By rearranging Equation 9-1, we get:

$$\textbf{(9-9)} \quad I = (\text{GDP} - C - G) + (IM - X)$$

Using Equation 9-6, we can break $(\text{GDP} - C - G)$ into private savings and the budget balance, yielding for an open economy:

$$\textbf{(9-10)} \quad I = S_{Private} + S_{Government} + (IM - X)$$
$$= NS + KI$$

or

Investment spending = *National savings* + *Capital inflow* in an Open economy

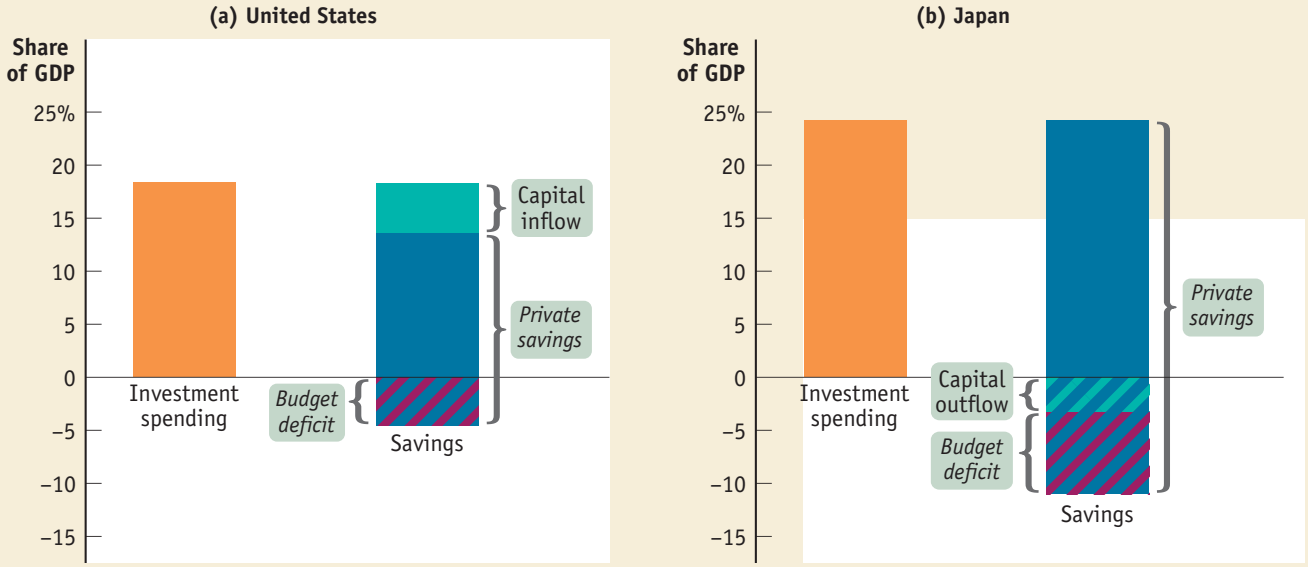
So the savings–investment spending identity for an open economy means that investment spending is equal to savings, where savings is equal to national savings *plus*

capital inflow. That is, in an open economy with a positive capital inflow, some investment spending is funded by the savings of foreigners. And in an open economy with a negative capital inflow (or outflow), some portion of national savings is funding investment spending in other countries. In the United States in 2004, investment spending totaled $2,307 billion. Private savings were $1,927 billion, offset by a budget deficit of $358 billion and supplemented by capital inflows of $636 billion. Notice that these numbers don't quite add up; because data collection isn't perfect, there is a "statistical discrepancy" of $102 billion. But we know that this is an error in the data because the savings–investment spending identity must hold in reality.

Figure 9-2 shows what this identity actually looked like in 2003 for the world's two largest economies, those of the United States and Japan. To make the two economies easier to compare, we've expressed savings and investment spending as percentages of GDP. As in Figure 9-1, in each panel the bars on the left show total investment spending and those on the right show the components of savings. U.S. investment spending was 18.4% of GDP, financed by a combination of private savings (18.2% of GDP) and capital inflows (4.8% of GDP) and partly offset by government dissaving (–4.6% of GDP). Japanese investment spending was higher as a percent of GDP, at 24.2%. It was financed by a higher level of private savings as a percent of GDP (35.3%) and was offset by both a capital outflow (–3.2% of GDP) and a relatively high budget deficit (–7.9% of GDP).

The economy's savings, then, finance its investment spending. But how are these funds available for investment spending allocated among various projects? That is, what determines which projects get financed (such as the Chunnel) and which don't (such as a new jetliner that would fly close to the speed of sound, which Boeing recently declined to fully develop and produce). We'll see shortly that funds get allocated to investment projects using a familiar method: by the market, via supply and demand.

Figure 9-2 **The Savings-Investment Spending Identity in Open Economies: the United States and Japan, 2003**



U.S. investment spending in 2003 (equal to 18.4% of GDP) was financed by private savings (18.2% of GDP) and capital inflows (4.8% of GDP), which were partially offset by a budget deficit (–4.6% of GDP). Japanese investment spending in 2003 was higher as a percent of GDP (24.2%). It was financed by a higher level of private savings as a percent of GDP (35.3%), which was offset by both a capital outflow (–3.2% of GDP) and a relatively high budget deficit (–7.9% of GDP).

Source: Bureau of Economic Analysis; OECD.

FOR INQUIRING MINDS

WHO ENFORCES THE ACCOUNTING?

The savings–investment spending identity is a fact of accounting. By definition, savings equal investment spending for the economy as a whole. But who enforces the arithmetic? For example, what happens if the amount that businesses want to invest in capital equipment is less than the amount households want to save?

The short answer is that actual and *desired* investment spending aren't always equal. Suppose that households suddenly decide to save more by spending less. The immediate effect will be that unsold goods pile up in stores and warehouses. And this increase in inventory counts as investment spending, albeit unintended. So the savings–investment spending identity still holds, because businesses end up engaging in more investment spending than they intended to. Similarly, if households suddenly decide to save less and spend more, inventories will drop—and this will be counted as *negative* investment spending.

A real-world example occurred in 2001. Savings and investment spending, measured at an annual rate, both fell by $126 billion between the second and the fourth quarter of 2001. But on the investment spending side, $71 billion of that fall took the form of negative inventory investment spending.

Of course, businesses respond to changes in their inventories by changing their production. The inventory reduction in late 2001 prepared the ground for a spurt in output in early 2002. We'll examine the special role of inventories in economic fluctuations in later chapters.

The Market for Loanable Funds

For the economy as a whole, savings always equals investment spending. In a closed economy, savings is equal to national savings. In an open economy, savings is equal to national savings plus capital inflow. At any given time, however, savers, the people with funds to lend, are usually not the same as borrowers, the people who want to borrow to finance their investment spending. How are savers and borrowers brought together?

Savers and borrowers are matched up with one another in much the same way producers and consumers are matched up: through markets governed by supply and demand. In Figure 7-1, the expanded circular-flow diagram, we noted that the *financial markets* channel the savings of households to businesses that want to borrow in order to purchase capital equipment. It's now time to take a look at how those financial markets work.

As we noted in Chapter 7, there are a large number of different financial markets in the financial system, such as the bond market and the stock market. However, economists often work with a simplified model in which they assume that there is just one market that brings together those who want to lend money (savers) and those who want to borrow (firms with investment spending projects). This hypothetical market is known as the **loanable funds market.** The price that is determined in the loanable funds market is the **interest rate,** denoted by r, the return a lender receives for allowing borrowers the use of a dollar for one year.

The **loanable funds market** is a hypothetical market that examines the market outcome of the demand for funds generated by borrowers and the supply of funds provided by lenders.

The **interest rate** is the price, calculated as a percentage of the amount borrowed, charged by the lender to a borrower for the use of their savings for one year.

We should note at this point that there are, in reality, many different kinds of interest rates because there are many different kinds of loans—short-term loans, long-term loans, loans made to corporate borrowers, loans made to governments, and so on. In the interest of simplicity, we'll ignore those differences and assume that there is only one type of loan. But an important distinction, one that we will explore in Chapter 16, is between the *real interest rate*—the interest rate adjusted for changes in prices over the length of the loan, and the *nominal interest rate*—the interest rate unadjusted for such price changes. In the context of the hypothetical loanable funds market, we'll keep things simple by assuming that there are no price changes and that, as a result, there is no difference between the real and the nominal interest rate.

Figure 9-3

The Demand for Loanable Funds

The demand curve for loanable funds slopes downward: the lower the interest rate, the greater the quantity of loanable funds demanded. In this example, reducing the interest rate from 12% to 4% increases the quantity of loanable funds demanded from $150 billion to $450 billion.

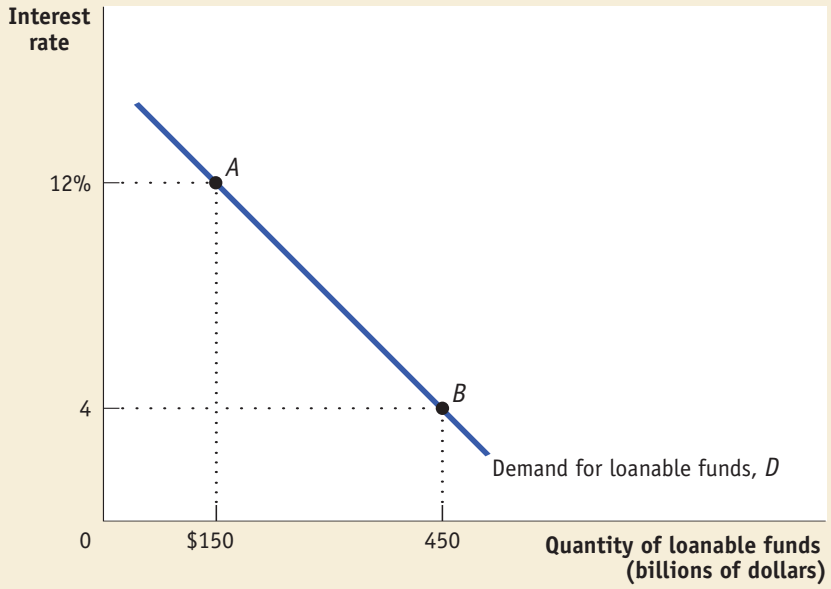


Figure 9-3 illustrates the hypothetical demand for loanable funds, represented be a downward-sloping demand curve. Imagine that there are many businesses, each of which has one potential investment project. How does a given business decide whether or not to borrow money to finance its project? The decision depends on the interest rate the business faces and the **rate of return** of its project—the profit earned on the project expressed as a percentage of its cost. This can be expressed in a formula as:

The **rate of return** of a project is the profit earned on the project expressed as a percentage of its cost.

$$\textbf{(9-11)} \quad \textit{Rate of return} = \frac{(\textit{Revenue from project} - \textit{Cost of project})}{\textit{Cost of project}} \times 100$$

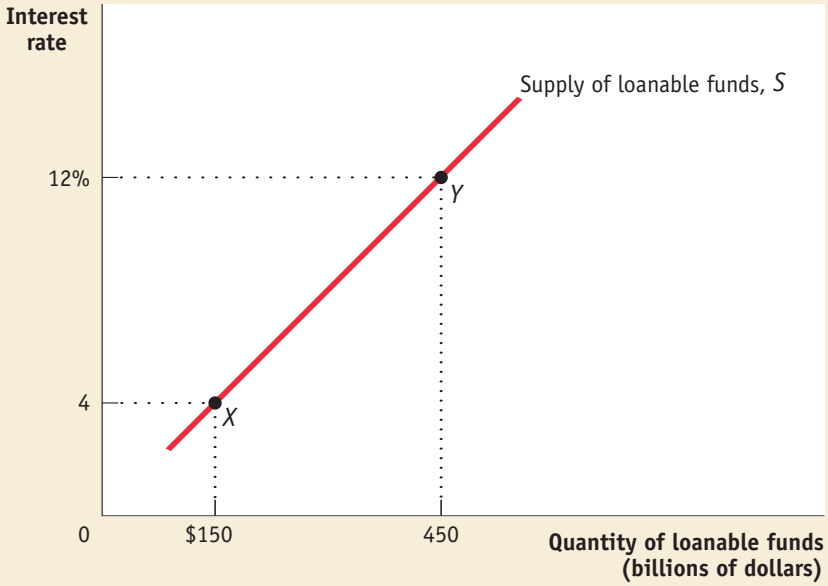
A business will want a loan when the rate of return on its project is at least as great as the interest rate. So, for example, at an interest rate of 12%, only businesses with projects that yield a rate of return greater than or equal to 12% will want a loan. The demand curve in Figure 9-3 shows that if the interest rate is 12%, businesses will want to borrow $150 billion (point *A*); if the interest rate is only 4%, businesses will want to borrow a larger amount, $450 billion (point *B*). That's a consequence of our assumption that the demand curve slopes downward: the lower the interest rate, the larger the total quantity of loanable funds demanded. Why do we make that assumption? Because, in reality, the number of potential investment projects that yield at least 4% is always greater than the number that yield at least 12%.

Figure 9-4 on page 218 shows the hypothetical supply of loanable funds. Savers have an opportunity cost for the funds that they could lend to a business; they could instead be spent on consumption—say, a nice vacation. Whether a given saver becomes a lender by making funds available to borrowers depends on the interest rate received in return. By saving your money today and earning interest on it, you are rewarded with higher consumption in the future when your loan is repaid with interest. So it is a good assumption that more people are willing to forgo current consumption and make a loan when the interest rate is higher. As a result, our hypothetical supply curve of loanable funds slopes upward. In Figure 9-4, lenders will supply $150 billion to the loanable funds market at an interest rate of 4% (point *X*); if the interest rate rises to 12%, the quantity of loanable funds supplied will rise to $450 billion (point *Y*).

Figure 9-4

The Supply of Loanable Funds

The supply curve for loanable funds slopes upward: the higher the interest rate, the greater the quantity of loanable funds supplied. In this example, increasing the interest rate from 4% to 12% increases the quantity of loanable funds supplied from $150 billion to $450 billion.

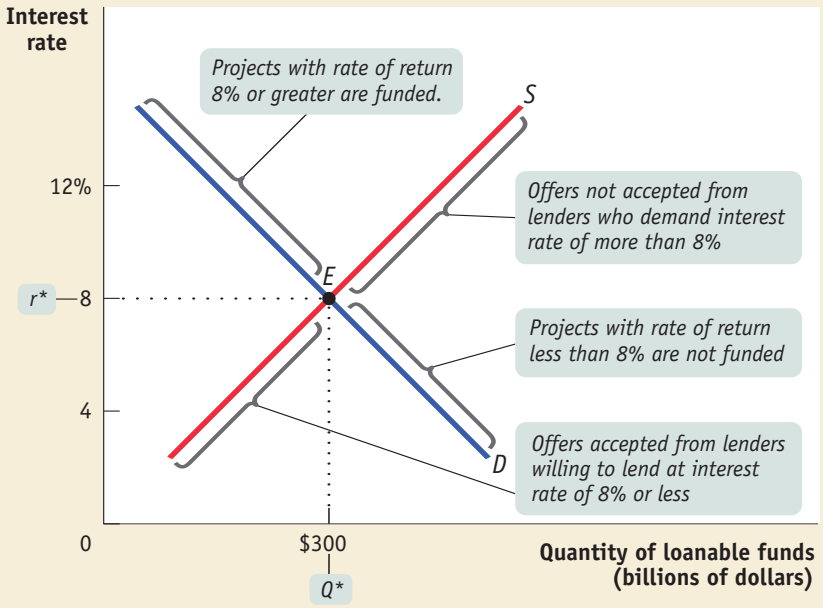


The equilibrium interest rate is the interest rate at which the quantity of loanable funds supplied equals the quantity of loanable funds demanded. As you can see in Figure 9-5, the equilibrium interest rate, r^*, and the total quantity of lending, Q^*, are determined by the intersection of the supply and demand curves, at point *E*. Here, the equilibrium interest rate is 8%, at which $300 billion is lent and borrowed. Investment spending projects with a rate of return of 8% or more are funded; projects with a rate of return of less than 8% are not. Correspondingly, only lenders who are willing to accept an interest rate of 8% or less will have their offers to lend funds accepted. Potential lenders who demand an interest rate higher than 8% have a higher opportunity

Figure 9-5

Equilibrium in the Loanable Funds Market

At the equilibrium interest rate, the quantity of loanable funds supplied equals the quantity of loanable funds demanded. Here the equilibrium interest rate is 8%, with $300 billion of funds lent and borrowed. Investment spending projects with a rate of return of 8% or higher receive financing; those with a lower rate of return do not. Lenders who demand an interest rate of 8% or lower have their offers of loans accepted; those who demand a higher interest rate do not.



cost of their funds (say, for personal consumption). Their offers to lend will be turned down in the loanable funds market, and their funds will remain uninvested.

In Chapter 5 we learned that a market for an ordinary good, such as used textbooks, is usually efficient. The same is true of the hypothetical market for loanable funds. The investment spending projects that are actually financed have higher rates of return than those that do not get financed. The potential savers who actually lend funds are willing to lend for lower interest rates than those who do not. In other words, the loanable funds market maximizes the gains from trade between lenders and borrowers. Savings are allocated efficiently to investment projects throughout the economy. This result, although drawn from a highly simplified model, has important implications for real life. As we'll see shortly, it is the reason that a well-functioning financial system increases an economy's rate of long-run economic growth.

Savings, Investment Spending, and Government Policy

Our model of the loanable funds market is very simple, yet it is enough to give us some preliminary insight into the a source of concern about effect of government policy on economic growth.

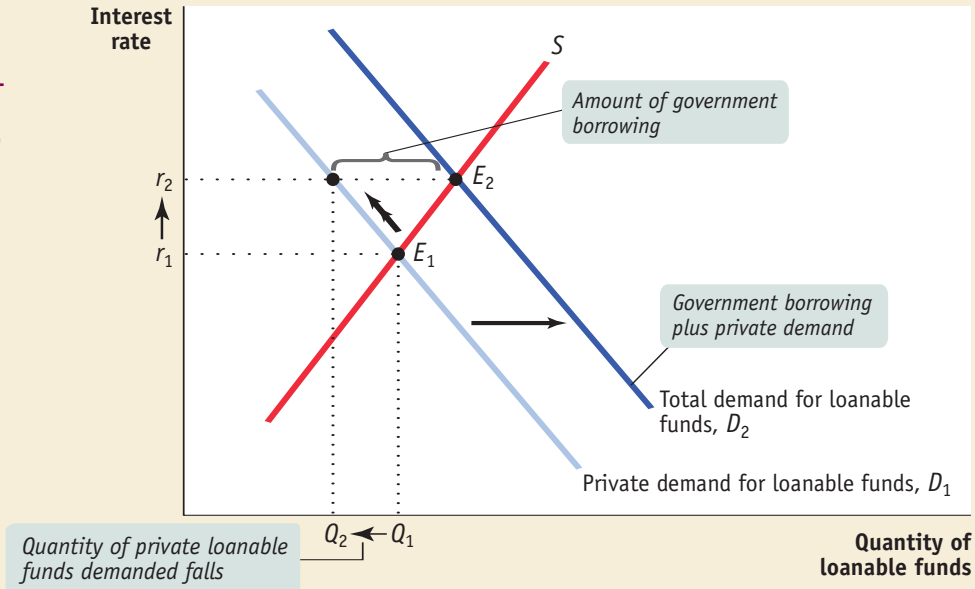
Consider first the impact of the government's budget. When the government runs a budget deficit, it must borrow funds to cover the gap between tax revenue and government spending—the government becomes a borrower in the loanable funds market. And we'll make an assumption, consistent with real government behavior, that the amount of government borrowing does not depend on the interest rate. At any given interest rate, private (non-government) borrowers still want to borrow as much as before the emergence of the budget deficit. But now, at any given interest rate, the government makes additional demand for funds. Figure 9-6 shows what happens. The demand curve for loanable funds shifts rightward by the amount of the government's borrowing. As a result, the equilibrium moves from E_1 to E_2. The interest rate and the total amount of borrowing rise. Because of the higher interest rate, however, the amount of private borrowing falls from Q_1 to Q_2, as shown by the movement up the demand curve D_1.

This decrease in private borrowing means that as a result of the budget deficit, businesses will engage in less investment spending than they otherwise would have.

Figure 9-6

Crowding Out

A government must borrow if it runs a deficit, and this borrowing adds to the total demand for loanable funds. As a result, the demand curve for loanable funds shifts rightward by the amount of the government borrowing and the equilibrium moves from E_1 to E_2. This leads to an increase in the equilibrium interest rate from r_1 to r_2 and crowding out: the increase in the interest rate reduces the *private* quantity of loanable funds demanded from Q_1 to Q_2, as shown by the movement up the demand curve D_1.



Crowding out is the negative effect of budget deficits on private investment.

This negative effect of budget deficits on private investment spending is called **crowding out.** When a budget deficit causes crowding out, the economy adds less private physical capital each year than it would if the budget were balanced or in surplus. And since private physical capital is one of the sources of productivity growth, budget deficits, *other things equal*, lead to lower long-run growth.

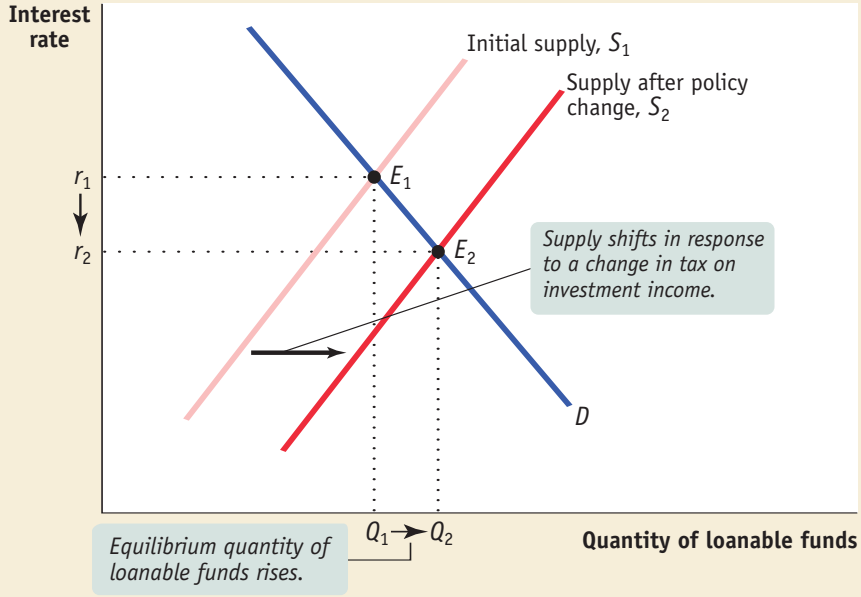
But this should not be interpreted to mean that government spending is necessarily bad for economic growth! It depends on what the government is spending its money on. In fact, as we learned in Chapter 8, much government spending is essential to growth. For example, the court system must be kept running to enforce contracts, and the public health system must be maintained to prevent the spread of disease. Governments also do quite a lot of investment spending themselves—for example, building and maintaining necessary infrastructure such as roads, schools, and airports. Our analysis of crowding out is an "other things equal" result: When government spending has *already* created the things that enhance growth (such as a court system and roads), *further* government spending that results in budget deficits reduces private investment spending and lowers growth. So we cannot say unambiguously that government spending that results in a budget deficit either decreases or increases economic growth.

Government borrowing is not the only policy that affects the loanable funds market. Many economists have argued for changes in the tax system that they believe would lead to higher private savings and lower current consumption but would generate the same amount of total tax revenue. An example would be reducing the tax on investment income (such as interest on bonds and dividends on stocks) but increasing the sales tax on consumption of goods and services. A reduction in the tax on investment income induces people to save more because it raises the net return earned on savings after taxes are paid, while an increase in the sales taxes induces people to consume less by making the total cost of goods and services higher. Figure 9-7 shows what would happen if their proposals were adopted and if they turned out to be right. The supply of funds to the loanable funds market would increase—that is, the supply curve would shift to the right. The equilibrium would move from E_1 to E_2, the interest rate would fall from r_1 to r_2, and private borrowing would increase from Q_1 to Q_2. So a tax reform that increases private savings would lead to higher private investment spending and, as a result, to higher long-run economic growth.

Figure 9-7

Increasing Private Savings

Some economists have urged reforms in the tax system and adoption of other policies that would, they say, increase private savings but keep tax revenue unchanged. If they are correct, the effect would be to shift the supply curve of loanable funds to the right, leading to a reduction in the equilibrium interest rate and a larger quantity of funds lent and borrowed. Private investment spending in the economy would rise and so, ultimately, would long-run economic growth.



The loanable funds model is a good way to think about many issues involving savings and investment spending. Although very simple, it illustrates the trade-off involved in deciding whether to save and lend or whether to consume as well as the trade-off involved in deciding whether or not to borrow and undertake an investment spending project. It also illustrates how an interest rate moves to equalize the supply and demand for loanable funds. In reality, though, the actual markets that channel savings into investment spending are more complex than that. We turn next to an examination of those markets.

economics in action

Budgets and Investment Spending in the 1990s

Do government budget deficits really crowd out private investment spending? Does moving from deficit to surplus really encourage private investment spending? These questions aren't just academic; they have a direct bearing on political issues such as the spending priorities of the government. So what does the evidence say?

The U.S. government moved from a deficit of 3.9% of GDP in 1990 to a large surplus, more than 2.4% of GDP, in 2000. Over the same period private investment spending rose rapidly, rising from 18.6% to 20.8% of GDP. Did this move from deficit to surplus, accompanied by a boom in private investment spending on capital projects, demonstrate that deficits really do crowd out private investment spending?

It's not clear. As the budget balance went from negative to positive, the private savings rate fell sharply, from 7.3% to 3.5% of GDP. Overall national savings, the sum of private savings plus the budget balance, rose only a bit, from 4.5% to 5.9% percent of GDP.

How did the United States increase private investment spending so much? The answer was a huge increase in capital inflows. Indeed, you could say that the investment spending boom of the 1990s was basically foreign-financed.

There are two morals to this story. First, although the data don't show it unambiguously, from our model we can conclude that the move from budget deficit to budget surplus in the late 1990s made private investment spending *greater than it would have been* if there had been no increase in the budget balance. Second, we must be careful about jumping to conclusions about the impact of government policies on the basis of observed data—lots of other things tend to be happening at the same time as policy changes, and those other things may be the real story. ■

>>QUICK REVIEW

- According to the *savings–investment spending identity,* savings is equal to investment spending for the economy as a whole.
- The government is a source of savings when it runs a positive *budget balance,* also known as a *budget surplus.* It is a source of dissavings when it runs a *budget deficit.*
- In a closed economy, savings is equal to *national savings.* In an open economy, savings is equal to national savings plus *capital inflow.*
- The hypothetical *loanable funds market* matches savers to borrowers. In equilibrium, only investment spending projects with a *rate of return* greater than or equal to the equilibrium *interest rate* are funded.
- Budget deficits can cause *crowding out* of private investment spending. It is unclear whether crowding out raises or lowers economic growth.

>>CHECK YOUR UNDERSTANDING 9-1

1. Suppose the government's deficit becomes a budget surplus. Using a diagram like Figure 9-6, show the effects on private investment spending and the equilibrium interest rate.
2. Illustrate with a diagram of the loanable funds market the effect of the following events on the equilibrium interest rate and investment spending.
   a. A closed economy becomes an open one. A capital inflow occurs.
   b. Retired people generally save less than working people at any interest rate. The proportion of retired people in the population goes up.
3. Explain what is wrong with the following statement: "Savings and investment spending may not be equal in the economy as a whole because when the interest rate rises, households will want to save more money than businesses will want to invest."

Solutions appear at back of book.

The Financial System

A well-functioning financial system that brought together the funds of British, French, and other international investors made the Chunnel possible. But to think that this is an exclusively modern phenomenon is misguided. Financial markets raised

the funds that were used to develop colonial markets in India, to build canals across Europe, and to finance the Napoleonic wars in the eighteenth century. Capital inflows financed the early economic development of the United States, funding investment spending in mining, railroads, and canals. In fact, many of the principal features of financial markets and assets have been well understood in Europe and the United States since the eighteenth century. However, these features are no less relevant today. So let's begin by understanding exactly what is traded in financial markets.

A household's **wealth** is the value of its accumulated savings.

A **financial asset** is a paper claim that entitles the buyer to future income from the seller.

A **physical asset** is a claim on a tangible object that gives the owner the right to dispose of the object as he or she wishes.

Financial markets are where households invest their current savings and their accumulated savings, or **wealth,** by purchasing *financial assets*. A **financial asset** is a paper claim that entitles the buyer to future income from the seller. For example, when a saver lends funds to a company, the loan is a financial asset sold by the company that entitles the lender (the buyer) to future income from the company. A household can also invest its current savings or wealth by purchasing a **physical asset,** a claim on a tangible object, such as a preexisting house or preexisting piece of equipment. It gives the owner the right to dispose of the object as he or she wishes (for example, rent it or sell it). Recall from Pitfalls on page 214 that the purchase of a financial or physical asset is typically called investing. So if you purchase a preexisting piece of equipment—say, a used airliner—you are engaging in investing in a physical asset. But if you spend funds that *add* to the stock of physical capital in the economy—say, purchasing a newly manufactured airplane—you are engaging in investment spending.

A **liability** is a requirement to pay income in the future.

If you were to go to your local bank and get a loan—say, to buy a new car—you and the bank would be creating a financial asset—your loan. A *loan* is one important kind of financial asset in the real world, one that is owned by the lender—in this case, your local bank. In creating that loan, you and the bank would also be creating a **liability,** a requirement to pay income in the future. So although your loan is a financial asset from the bank's point of view, it is a liability from your point of view: a requirement that you repay the loan, including any interest. In addition to loans, there are three other important kinds of financial assets: stocks, bonds, and *bank deposits*. Because a financial asset is a claim to future income that someone has to pay, it is also someone else's liability. We'll explain in detail shortly who bears the liability for each type of financial asset.

These three types of financial assets exist because the economy has developed a set of specialized markets, like the stock market and the bond market, and specialized institutions, like banks, that facilitate the flow of funds from lenders to borrowers. In Chapter 7, in the context of the circular-flow diagram, we defined the financial markets and institutions that make up the financial system. A well-functioning financial system is a critical ingredient in achieving long-run growth because it encourages greater savings and investment spending; it also ensures that savings and investment spending are undertaken efficiently. To understand how this occurs, we first need to know what tasks the financial system needs to accomplish. Then we can see how the job gets done.

Three Tasks of a Financial System

Our earlier analysis of the loanable funds market ignored three important problems facing borrowers and lenders: *transaction costs*, *risk*, and the desire for *liquidity*. The three tasks of a financial system are to reduce these problems in a cost-effective way. Doing so enhances the efficiency of financial markets: it makes it more likely that lenders and borrowers will make mutually beneficial trades—trades that increase society's welfare. We'll turn now to examining how financial assets are designed and how institutions are developed to cope with these problems.

Transaction costs are the expenses of negotiating and executing a deal.

Reducing Transaction Costs

Transaction costs are the expenses of actually putting together a deal. For example, arranging a loan requires spending time and money negotiating the terms of the deal, verifying the borrower's ability to pay, drawing up and executing legal documents, and so on. Suppose a large business decided that it

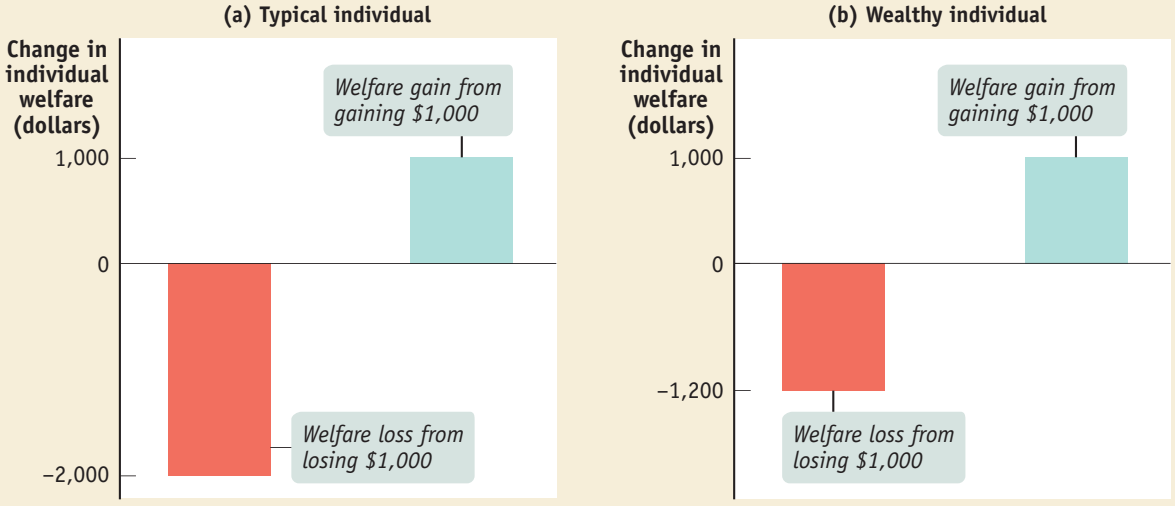
wanted to raise $100 million for investment spending. No individual would be willing to lend that much. And negotiating individual loans from thousands of different people, each willing to lend a modest amount, would impose very large total costs because each individual transaction would incur a cost. Total costs would be so large that the entire deal would probably be unprofitable for the business.

Fortunately, that's not necessary: when large businesses want to borrow money, they either go to a bank or sell bonds in the bond market. Obtaining a loan from a bank avoids large transaction costs because it involves only a single borrower and a single lender. We'll explain more about how bonds work in the next section. For now, it is enough to know that the principal reason there is a bond market is that it allows companies to borrow large sums of money without incurring large transaction costs.

Reducing Risk A second problem that real-world borrowers and lenders face is **financial risk,** uncertainty about future outcomes that involve financial losses and gains. Financial risk (which from now on we'll simply call "risk") is a problem because the future is uncertain, typically containing the potential for losses as well as gains. For example, owning and driving a car entails the financial risk of a costly accident. Most people view potential losses and gains in an asymmetrical way: the total loss in individual welfare from losing a given amount of money is considered larger than the total gain in welfare from gaining the same amount of money. A person who values potential losses and gains in this asymmetrical way is called *risk-averse*. This attitude toward risk is illustrated in panel (a) of Figure 9-8. Here, we show an example of a typical risk-averse person who is faced with the prospect of losing $1,000 or gaining $1,000. The bar on the left, which represents the loss in welfare from losing $1,000, is longer than the bar on the right, which represents the gain in welfare from gaining $1,000. The difference in the lengths of these two bars illustrates risk aversion: a person experiences a $1,000 loss as a significant hardship (equivalent to a $2,000 loss in welfare) and a $1,000 gain as a much less significant benefit (equivalent to a $1,000 gain in welfare). To put it a slightly different way, if you are risk-averse, you are willing to expend more

Financial risk is uncertainty about future outcomes that involve financial losses and gains.

Figure 9-8 Risk-Averse Attitudes Toward Gain and Loss



A comparison of panels (a) and (b) shows that differences in wealth lead to differences in attitudes toward risk. The typical person represented in panel (a) experiences a $1,000 loss as a much more significant hardship than the wealthy person represented in panel (b). This reflects the fact that wealthy individuals, although still risk averse, tend to be more tolerant of risk than individuals of modest means.

resources to avoid losing $1,000 (say, by buying an auto insurance policy) than you are willing to expend to gain $1,000 (say, by hunting around to find the cheapest mechanic when your car needs a major repair).

Most people are risk-averse, although to differing degrees. For example, people who are wealthy are typically less risk-averse than those who are not so well-off. As panel (b) shows, a wealthy person—while still risk-averse—would consider the loss of $1,000 a lot less of a hardship than would a person of modest means. Such a loss would be experienced as only a $1,000 loss in welfare by a wealthy individual, compared to a $2,000 loss in welfare by a typical individual.

A well-functioning financial system helps people reduce their exposure to risk, which risk-averse people would like to do. Suppose the owner of a business expects to make additional profit if she buys additional capital equipment but isn't completely sure that this will indeed happen. She could pay for the equipment by using her savings or selling her house. But if the profit is significantly less than expected, she will have lost her savings, or her house, or both. That is, she would be exposing herself to a lot of risk arising from how well or poorly the business performs. (This is why business owners, who typically have a significant portion of their own personal wealth tied up in their businesses, are usually people who are more tolerant of risk than the average person.) So, being risk-averse, this business owner wants to share the risk of purchasing new capital equipment with someone even if that requires sharing some of the profit if all goes well. How can she do this? By selling shares of her company to other people and using the money she receives from selling shares, rather than money from the sale of other assets, to finance the equipment purchase. By selling shares in her company, she reduces her personal losses if the profit is less than expected: she won't have lost her other assets. But if things go well, the shareholders earn a share of the profit as a return on their investment.

By selling a share of her business, the owner has achieved *diversification:* she has been able to invest in several things in a way that lowers her total risk. She has maintained her investment in her bank account, a financial asset; in ownership of her house, a physical asset; and in ownership of the unsold portion of her business, also a physical asset. These investments are likely to carry some risk of their own; for example, her bank may fail or her house may burn down (though in the modern United States it is likely that she is partly protected against these risks by insurance.) But even in the absence of insurance, she is better off for having maintained investments in these different assets because their different risks are *unrelated,* or *independent, events*. This means, for example, that her house is no more likely to burn down if her business does poorly, and that her bank is no more likely to fail if her house burns down. To put it another way, if one asset performs poorly, it is very likely that her other assets will be unaffected and, as a result, her total risk of loss has been reduced. But if she had invested all her wealth in her business, she would have faced the prospect of losing everything if the business had performed poorly. By engaging in **diversification**—investing in several assets with unrelated, or independent, risks—our business owner has lowered her total risk of loss.

An individual can engage in **diversification** by investing in several different things so that the possible losses are independent events.

The desire of individuals to reduce their total risk by engaging in diversification is why we have stocks and a stock market. In the next section, we'll explain in more detail how certain features of the stock market increase the ability of individuals to manage and reduce risk.

Providing Liquidity The third and final task of the financial system is to provide investors with *liquidity*, a concern that—like risk—arises because the future is uncertain. Suppose that, once having made a loan, a lender suddenly finds himself in need of cash—say, to meet a medical emergency. Unfortunately, if that loan was made to a business that used it to buy new equipment, the business cannot repay the loan on short notice to satisfy the lender's need to recover his money. Knowing this in advance—that there is a danger of needing to get his money back before the term of the loan is up—our lender might be reluctant to lock up his money by loaning it to a business.

An asset is **liquid** if it can be quickly converted into cash, **illiquid** if it cannot. As we'll see, stocks and bonds are a partial answer to the problem of liquidity. Banks provide a further way for individuals to hold liquid assets and still finance illiquid investments.

To help lenders and borrowers make mutually beneficial deals, then, the economy needs ways to reduce transaction costs, to reduce and manage risk through diversification, and to provide liquidity. How does it achieve these tasks?

An asset is **liquid** if it can be quickly converted into cash.

An asset is **illiquid** if it cannot be quickly converted into cash.

Types of Assets

In the modern economy there are four main types of financial assets: loans, bonds, stocks, and bank deposits. Each serves a somewhat different purpose. We'll examine loans, bonds, and stocks now, reserving our discussion of bank deposits until the following section.

Loans A **loan** is a lending agreement between a particular lender and a particular borrower. Most people encounter loans in the form of bank loans to finance the purchase of a car or a house. And small businesses usually use bank loans to buy new equipment.

A **loan** is a lending agreement between a particular lender and a particular borrower.

The good aspect of loans is that a given loan is usually tailored to the needs of the borrower. Before a small business can get a loan, it usually has to discuss its business plans, its profits, and so on with the lender. This results in a loan that meets the borrower's needs and ability to pay.

The bad aspect of loans is that making a loan to an individual person or a business typically involves a lot of transaction costs, such as the cost of negotiating the terms of the loan, investigating the borrower's credit history and ability to repay, and so on. To minimize these costs, large borrowers such as major corporations and governments often take a more streamlined approach: they sell (or issue) bonds.

Bonds As we learned in Chapter 7, a bond is a promise by the seller to pay interest each year and to repay the principal to the owner of the bond on a particular date. So a bond is a financial asset from its owner's point of view and a liability from its issuer's point of view. A bond issuer sells a number of bonds with a given interest rate and maturity date to whoever is willing to buy them, a process that avoids costly negotiation of the terms of a loan with many individual lenders.

Bond purchasers can acquire information free of charge on the quality of the bond issuer, such as the bond issuer's credit history, from *bond-rating agencies* rather than having to incur the expense of investigating it themselves. As a result, bonds can be sold on the bond market as a more or less standardized product—a product with clearly defined terms and quality.

Another important advantage of bonds is that they are easy to resell. This provides liquidity to bond purchasers. Indeed, a bond will often pass through many hands before it finally comes due. Loans, in contrast, are much more difficult to resell because, unlike bonds, they are not standardized: they differ in size, quality, terms, and so on. This makes them a lot less liquid than bonds.

Christopher Weyant

"Damn it, I don't want to know about my love life. Tell me about the bond market."

Stocks As we learned in Chapter 7, a stock is a share in the ownership of a company. A share of stock is a financial asset from its owner's point of view and a liability from the the company's point of view. Not all companies sell shares of their stock; "privately held" companies are owned by an individual or a few partners, who get to keep all of the company's profit. Most large companies, however, do sell stock. For example, Microsoft has nearly 11 billion shares outstanding; if you buy one of those shares, you are entitled to one six-billionth of the company's profit, as well as 1 of 6 billion votes on company decisions.

Why does Microsoft, historically a very profitable company, allow you to buy a share in its ownership? Why don't Bill Gates and Paul Allen, the two founders of Microsoft, keep ownership for themselves and just sell bonds for their investment spending needs? The reason, as we have just learned, is risk: few individuals are risk-tolerant enough to face the risk involved in being the owners of a large company.

Reducing the risk that business owners face, however, is not the only way in which the existence of stocks improves society's welfare: it also improves the welfare of investors who buy stocks. Shareowners are able to enjoy the higher returns over time that stocks generally offer in comparison to bonds. Over the past century, stocks have typically yielded about 7% after adjusting for inflation; bonds have yielded only about 2%. But as investment companies warn you, "past performance is no guarantee of future performance." But there is a downside: owning the stock of a given company is riskier than owning a bond issued by the same company. Why? Loosely speaking, a bond is a promise while a stock is a hope: by law, a company must pay what it owes its lenders before it distributes any profit to its shareholders. And if the company should fail (that is, be unable to pay its interest obligations and declare bankruptcy), its physical and financial assets go to its lenders but its shareholders generally receive nothing. So although a stock generally provides a higher return to an investor than a bond, it also carries higher risk.

But the financial system has devised ways to help investors as well as business owners both manage risk and enjoy somewhat higher returns. It does that through the services of institutions known as *financial intermediaries*.

A **financial intermediary** is an institution that transforms the funds it gathers from many individuals into financial assets.

Financial Intermediaries

A **financial intermediary** is an institution that transforms funds gathered from many individuals into financial assets. The most important types of financial intermediaries are *mutual funds, pension funds*, *life insurance companies*, and *banks*. About three-quarters of the financial assets Americans own are held through these intermediaries rather than directly.

Mutual Funds As we've explained, owning shares of a company entails risk in return for a higher potential reward. But it should come as no surprise that stock investors can lower their total risk by engaging in diversification. By owning a *diversified portfolio* of stocks—a group of stocks in which risks are unrelated to or offset one another—rather than concentrating investment in the shares of a single company or a group of related companies, investors can reduce their risk. In addition, financial advisers, aware that most people are risk-averse, almost always advise their clients to diversify not only their stock portfolio but also their entire wealth by holding other assets in addition to stocks, such as bonds, real estate, and cash. (And, for good measure, to have plenty of insurance in case of accidental losses!)

A **mutual fund** is a financial intermediary that creates a stock portfolio and then resells shares of this portfolio to individual investors.

However, for individuals who don't have a large amount of money to invest—say $1 million or more—building a diversified stock portfolio can incur high transaction costs (particularly fees paid to stock brokers) because they are buying a few shares of a lot of companies. Fortunately for such investors, mutual funds solve the problem of achieving diversification without high transaction costs. A **mutual fund** is a financial intermediary that creates a stock portfolio by buying and holding shares in companies and then reselling *shares of the stock portfolio* to individual investors. By buying these shares, investors with a relatively small amount of money to invest can indirectly hold a diversified portfolio, achieving a better return for any given level of risk than they could otherwise achieve. Table 9-1 shows an example of a diversified mutual fund, the State Street Global Advisors S&P 500 Index Fund. It shows the percentage of investors' money invested in the stocks of the largest companies in the mutual fund's portfolio.

Many mutual funds also perform *market research* on the companies they invest in. This is important because there are thousands of stock-issuing U.S. companies (not to mention foreign companies), each differing in terms of its likely profitability, dividend payments, and so on. It would be extremely time-consuming and costly for an

TABLE 9-1

State Street Global Advisors, S&P 500 Index Fund, Top Holdings (as of March 31, 2005)

Company	Percent of mutual fund assets invested in company
General Electric	3.53
Exxon Mobil	3.52
Microsoft	2.26
Citigroup	2.17
Johnson & Johnson	1.85
Pfizer	1.81
Bank of America	1.65
Wal-Mart Stores	1.57
IBM	1.38
Intel	1.34

Source: State Street Global Advisors.

individual investor to do adequate research on even a small number of companies. Mutual funds save transaction costs by doing this research for their customers.

The mutual fund industry represents a huge portion of the modern U.S. economy, not just of the U.S. financial system. The largest mutual fund at the end of 2004 was State Street Global Advisors, which managed $1.4 trillion in funds.

Pension Funds and Life Insurance Companies In addition to mutual funds, many Americans have holdings in **pension funds,** nonprofit institutions that collect the savings of their members and invest those funds in a wide variety of assets, providing their members with income when they retire. Although pension funds are subject to some special rules and receive special treatment for tax purposes, they function much like mutual funds. They invest in a diverse array of financial assets, allowing their members to achieve more cost-effective diversification and market research than they would be able to achieve individually. Pension funds in the United States hold more than $8 trillion in assets.

A **pension fund** is a type of mutual fund that holds assets in order to provide retirement income to its members.

Americans also have substantial holdings in the policies of **life insurance companies,** which guarantee a payment to the policyholder's beneficiaries (typically, the family) when the policyholder dies. By enabling policyholders to cushion their beneficiaries from financial hardship arising from their death, life insurance companies also improve welfare by reducing risk.

A **life insurance company** sells policies that guarantee a payment to a policyholder's beneficiaries when the policyholder dies.

Banks Recall the problem of liquidity: other things equal, people want assets that can be readily converted into cash. Bonds and stocks are much more liquid than physical assets or loans, yet the transaction cost of selling bonds or stocks to meet a sudden expense can be large. Furthermore, for many small and moderate-size companies, the cost of issuing bonds and stocks is too large given the modest amount of money they seek to raise. A *bank* is an institution that helps resolve the conflict between lenders' needs for liquidity and the financing needs of borrowers who don't want to use the stock or bond markets.

A bank works by first accepting funds from *depositors*: when you put your money in a bank, you are essentially becoming a lender by lending the bank your money. In return, you receive credit for a **bank deposit**—a claim on the bank, which is obliged to give you your cash if and when you demand it. So a bank deposit is a financial asset owned by the depositor and a liability of the bank that holds it.

A **bank deposit** is a claim on a bank that obliges the bank to give the depositor his or her cash when demanded.

A bank, however, keeps only a fraction of its customers' deposits in the form of ready cash. Most of its deposits are lent out to businesses, buyers of new homes, and other borrowers. These loans come with a long-term commitment by the bank to the

borrower: as long as the borrower makes his or her payments on time, the loan cannot be recalled by the bank and converted into cash. So a bank enables those who wish to borrow for long lengths of time to use the funds of those who wish to lend but simultaneously want to maintain the ability to get their cash back on demand. More formally, a **bank** is a financial intermediary that provides liquid financial assets in the form of deposits to lenders and uses their funds to finance the illiquid investments or investment spending needs of borrowers.

A **bank** is a financial intermediary that provides liquid assets in the form of bank deposits to lenders and uses those funds to finance the illiquid investments or investment spending needs of borrowers.

In essence, a bank is engaging in a kind of mismatch: lending for long periods of time but also subject to the condition that its depositors could demand their funds back at any time. How can it manage that?

The bank counts on the fact that, on average, only a small fraction of its depositors will want their cash at the same time. On any given day, some people will make withdrawals and others will make new deposits; these will roughly cancel each other out. So the bank needs to keep only a limited amount of cash on hand to satisfy its depositors. In addition, individual bank deposits are guaranteed to depositors up to $100,000 by the Federal Deposit Insurance Corporation, or FDIC, a federal agency. This reduces the risk to a depositor of holding a bank deposit, and thereby reduces the incentive to withdraw funds if concerns about the financial state of the bank should arise. So, under normal conditions, banks need hold only a fraction of their depositor's cash.

By reconciling the needs of savers for liquid assets with the needs of borrowers for long-term financing, banks play a key economic role. As the following Economics in Action explains, the creation of a well-functioning banking system was a key turning point in South Korea's economic success.

economics in action

Banks and the South Korean Miracle

As we discussed in Chapter 8, South Korea is one of the great success stories of economic growth. In the early 1960s, it was a very poor nation. Then it experienced spectacularly high rates of economic growth. South Korean banks had a lot to do with it.

In the early 1960s, South Korea's banking system was a mess. Interest rates on deposits were very low at a time when the country was experiencing a lot of inflation. So savers didn't want to save by putting money in a bank, fearing that much of their purchasing power would be eroded by rising prices. Instead, they engaged in current consumption by spending their money on goods and services or used their wealth to buy physical assets such as real estate and gold. And because savers refused to make bank deposits, businesses found it very hard to borrow money to finance investment spending.

In 1965 the South Korean government reformed the country's banks and increased interest rates to a level that was attractive to savers. Over the next five years the value of bank deposits increased 600%, and the national savings rate—the percentage of GDP going into national savings—more than doubled. The rejuvenated banking system made it possible for South Korean businesses to launch a great investment boom, a key element in the country's growth surge.

Many other factors besides banking were involved in South Korea's success, but the country's experience does show how important a good financial system is to economic growth. ■

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>>QUICK REVIEW

- Households can invest their current savings or their *wealth* by purchasing either *financial assets* or *physical assets*. A financial asset is a *liability* from the point of view of its seller.
- A well-functioning financial system reduces *transaction costs*, reduces *financial risk* by enabling *diversification*, and provides *liquid* assets, which investors prefer to *illiquid* assets.
- The four main types of financial assets are *loans*, bonds, stocks, and *bank deposits*.
- The most important types of *financial intermediaries* are *mutual funds*, *pension funds*, *life insurance companies*, and *banks*.
- A bank accepts bank deposits, which obliges it to return depositors' cash on demand, and lends those funds to borrowers for long lengths of time.

>>CHECK YOUR UNDERSTANDING 9-2

1. Rank the following assets in terms of (i) level of transaction costs, (ii) level of risk, (iii) level of liquidity.
   a. A bank deposit with a guaranteed interest rate
   b. A share of a highly diversified mutual fund, which can be quickly sold
   c. A share of the family business, which can be sold only if you find a buyer and all other family members agree to the sale

2. What relationship would you expect to find between the level of development of a country's financial system and its level of economic development? Explain in terms of the country's level of savings and level of investment spending.

Solutions appear at back of book.

Financial Fluctuations

We've learned that the financial system is an essential part of the economy; without stock markets, bond markets, and banks, long-run economic growth would be hard to achieve. Yet the news isn't entirely good: the financial system sometimes doesn't function well and instead seems to be a source of instability. For evidence, we need look no further than the pivotal event of modern macroeconomics, the Great Depression. The worst economic slump in American history is closely identified with the U.S. stock market crash of 1929. And the 2001 U.S. recession was preceded by a sharp decline in stock prices in 2001. In Chapter 10 we'll learn about the channel by which changes in stock prices influence macroeconomic performance—how changes in households' wealth caused by asset market fluctuations alter their demand for goods and services.

We could easily write a whole book on asset market fluctuations. In fact, many people have. Here, we briefly discuss the causes of stock price fluctuations.

The Demand for Stocks

Once a company issues shares of stock to investors, those shares can then be re-sold to other investors in the stock market. And these days, thanks to cable TV and the Internet, you can easily spend all day watching stock market fluctuations—the movement up and down of the prices of individual stocks as well as the indexes. These fluctuations reflect supply and demand by investors. But what causes the supply and demand for stocks to shift?

Remember that stocks are financial assets: they are shares in the ownership of a company. Unlike a good or service, whose value to its owner comes from its consumption, the value of an asset comes from its ability to generate higher *future consumption* of goods or services. A financial asset allows higher future consumption in two ways. It can generate future income through paying interest or dividends. But most stocks don't pay dividends, instead retaining their earnings to finance future investment spending. Investors purchase non-dividend-paying stocks in the belief that they will earn future income from selling the stock in the future at a profit, the second way of generating higher future income. Even in the cases of a bond or a dividend-paying stock, investors will not want to purchase an asset that they believe will sell for less in the future than today because such an asset will reduce their wealth when they sell it. So the value of a financial asset today depends on investors' beliefs about the *future value* or *price* of the asset. That is, if investors believe that it will be worth more in the future, they will demand more of the asset today at any given price. As a consequence, today's equilibrium price of the asset will rise. Conversely, if investors believe the asset will be worth less in the future, they will demand less today at any given price. As a consequence, today's equilibrium price of the asset will fall. In summary, today's stock prices will change according to changes in investors' expectations about future stock prices.

Suppose an event occurs that leads to a rise in the expected future price of a company's shares—say, for example, Apple announces that it expects higher profitability due to torrential sales of its iPods. Demand for Apple shares will increase. At the same time, existing shareholders will be less willing to supply their shares to the market at any given price, leading to a decrease in the supply of Apple shares. And as we know from Chapter 3, an increase in demand or a decrease in supply (or both) leads to a rise in price. Alternatively, suppose that an event occurs that leads to a fall in the expected future price of a company's shares—say, Krispy Kreme announces that it expects lower profitability due to the popularity of low-carb diets. Demand for Krispy Kreme shares will decrease. At the same time, supply will increase because existing shareholders will

FOR INQUIRING MINDS

HOW NOW, DOW JONES?

Financial news reports often lead with the day's stock market action, as measured by changes in the Dow Jones Industrial Average, the S&P 500, and the NASDAQ. What are these numbers, and what do they tell us?

All three are stock market *indexes*. Like the consumer price index, they are numbers constructed as a summary of average prices—in this case, prices of stocks. The Dow, created by the financial analysis company Dow Jones (owner of the *Wall Street Journal*), is an index of the prices of stock in 30 leading companies, such as Microsoft, Wal-Mart, and General Electric. The S&P 500 is an index of 500 companies, created by Standard and Poor's, another financial company. The NASDAQ is compiled by the National Association of Securities Dealers, which trades the stocks of smaller new companies, like the satellite radio companies Sirius and XM.

Chris Hondros/ Getty Images

It's unexpected news, not expected news, that makes for a busy day in the financial markets.

Because these indexes contain different groups of stocks, they track somewhat different things. The Dow, because it contains only 30 of the largest companies, tends to reflect the "old economy," the traditional business powerhouses. The NASDAQ is heavily influenced by technology stocks. The S&P 500, a broad measure, is in between.

Why are these indexes important? Because the movement in an index gives investors a quick, snapshot view of how stocks from certain sectors of the economy are doing. As we'll explain shortly, the price of a stock at a given point in time embodies investors' expectations about the future prospects of the underlying company. By implication, an index composed of stocks drawn from companies in a particular sector embodies investors' expectations of the future prospects of that sector of the economy. So a day on which the NASDAQ moves up but the Dow moves down implies that, on that day, prospects appear brighter for the high-tech sector than for the old economy sector. The movement in the indexes reflects the fact that investors are acting on their beliefs by selling stocks in the Dow and buying stocks in the NASDAQ.

be more willing to supply their Krispy Kreme shares to the market. Both changes lead to a fall in the stock price. So stock prices are determined by supply and demand—which, in turn, depend on investors' expectations about the future stock price.

Stock prices are also affected by changes in the attractiveness of substitute assets, like bonds. As we learned in Chapter 3, the demand for a particular good decreases when purchasing a substitute good becomes more attractive—say, due to a fall in its price. The same lesson holds true for stocks: when purchasing a bond becomes more attractive due to a rise in interest rates, stock prices will fall. And when purchasing a bond becomes less attractive due to a fall in interest rates, stock prices will rise.

But we haven't yet fully answered the question of what determines the price of a share of stock, because we haven't explained what determines investors' *expectations* about future stock prices.

Stock Market Expectations

There are two principal competing views about how stock price expectations are determined. One view, which comes from traditional economic analysis, emphasizes the rational reasons why expectations *should* change. The other, widely held by market participants and also supported by some economists, emphasizes the irrationality of market participants.

The Efficient Markets Hypothesis Suppose you were trying to assess what Krispy Kreme stock is really worth. To do this, you would look at the *fundamentals*, the underlying determinants of the company's future profits. These would include factors like the changing tastes of the American public and the price of sugar. You would also want to compare the earnings you could expect to receive from Krispy Kreme with the likely returns on other financial assets, such as bonds.

According to one view of asset prices, the value you would come up with after a careful study of this kind would, in fact, turn out to be the price at which Krispy Kreme stock is already selling in the market. Why? Because all publicly available information about Krispy Kreme's fundamentals is already embodied in its stock price. Any difference between the market price and the value suggested by a careful analysis of the underlying fundamentals would indicate a profit opportunity to smart investors, who would sell Krispy Kreme stock if it looked overpriced and buy it if it looked underpriced. The **efficient markets hypothesis** is the general form of this view; it means that asset prices always embody all publicly available information. An implication of the efficient markets hypothesis is that at any point in time stock prices are fairly valued: they reflect all currently available information about fundamentals. So they are neither overpriced nor underpriced.

The **efficient markets hypothesis** says that asset prices embody all publicly available information.

One implication of the efficient markets hypothesis is that the prices of stocks and other assets should change only in response to new information about the underlying fundamentals. Since new information is by definition unpredictable—if it were predictable, it wouldn't be new information—movements in asset prices are also unpredictable. As a result, the movement of, say, stock prices will follow a **random walk**—the general term for the movement over time of an unpredictable variable.

A **random walk** is the movement over time of an unpredictable variable.

The efficient markets hypothesis plays an important role in understanding how financial markets work. Most investment professionals and many economists, however, regard it as an oversimplification. Investors, they claim, aren't that rational.

Irrational Markets? Many people who actually play the markets, such as individual investors and professional money managers, are skeptical of the efficient markets hypothesis. They believe that markets often behave irrationally and that a smart investor can engage in successful "market timing"—buying stocks when they are underpriced and selling them when they are overpriced.

Although economists are generally skeptical about claims that there are sure-fire ways to outsmart the market, many have also challenged the efficient markets hypothesis. It's important to understand, however, that finding particular examples where the market got it wrong does not disprove the efficient markets hypothesis. If the price of Krispy Kreme stock plunges from $40 to $10 because of a sudden change in eating habits, this doesn't mean that the market was inefficient in originally pricing the stock at $40. The fact that eating habits were about to change wasn't publicly available information, so it wasn't embodied in the earlier stock price.

Serious challenges to the efficient markets hypothesis focus instead either on evidence of systematic misbehavior of market prices or on evidence that individual investors don't behave in the way the theory suggests. For example, some economists believe they have found strong evidence that stock prices fluctuate more than can be explained by news about fundamentals. Others believe they have strong evidence that individual investors behave in systematically irrational ways. For example, people seem to expect that a stock that has risen in the past will keep on rising, even though the efficient markets hypothesis tells us there is no reason to expect this.

Stock Prices and Macroeconomics

How do macroeconomists and policy makers deal with the fact that stock prices fluctuate a lot and that these fluctuations can have important economic effects? The short answer is that, for the most part, they adopt an open-minded but watchful attitude.

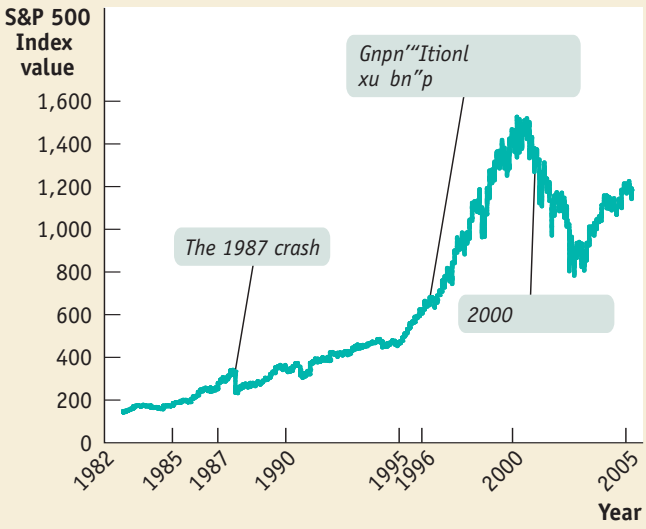
The efficient markets hypothesis suggests that policy makers shouldn't assume that the stock market is wrong—either that stock prices are too high or too low. The best guess is always that any information that is publicly available is already accounted for in stock prices.

At the same time, policy makers shouldn't assume that stock prices will be reasonably stable and consistent with rational investor behavior. Sudden rises or falls

in the market can happen for no obvious reason, and these fluctuations can have major macroeconomic effects. Policy makers have to be prepared to deal with them.

The question of how much to trust financial markets isn't academic. As the following Economics in Action explains, it was a hot issue during the 1990s.

Figure 9-9 **The S&P 500 Index from October 1982 to April 2005**



From 1982 to 1995 the stock market rose steadily with only a few setbacks, the most notable being the 1987 crash. In 1995, however, the market began growing at a much faster pace, and in 1996 Alan Greenspan cautioned that the market might be suffering from "irrational exuberance." The market, however, continued to rise for another four years—until 2000, when stock prices in general, and the prices of technology stocks in particular, suffered a large fall.

Source: Bureau of Labor Statistics.

economics in action

"Irrational Exuberance"

Robert Shiller is an economist at Yale Univeersity and one of the best-known critics of the efficient markets hypothesis. In 1996 he gave a briefing to Alan Greenspan, the chairman of the Federal Reserve, that gave rise to a famous phrase: "irrational exuberance."

Figure 9-9 provides some background for the story. It shows the value, since October 1982, of the S&P 500, the broadest of the stock indexes we discussed in For Inquiring Minds on page 230. As you can see, from 1982 to 2000 the stock market rose steadily, with only a few setbacks such as the 1987 crash.

One of those setbacks was the sudden crash in 1987, shown in the figure. There was no obvious fundamental reason for that crash. After the fact, some economists began coming up with reasons why a sudden fall in stock prices might have made sense. Shiller, however, actually surveyed investors *while* the market was crashing and found that they were selling simply because other people were selling. That is, it looked like mob psychology, not the working of an efficient market.

In 1996, when Shiller briefed Greenspan, the market was rising to unprecedented heights—and Shiller questioned whether this rise made sense. Greenspan shared his doubts and, in a famous speech, wondered whether the market was suffering from "irrational exuberance."

The big question, though, was whether Greenspan would do something about it, such as raising interest rates to discourage people from buying stocks. He didn't: he wasn't willing to second-guess the market to that extent. And, as you can see, stock prices continued to rise for another four years.

Starting in 2000, there was a large fall in stock prices, especially those of technology stocks, and many people now think that by the late 1990s, if not necessarily when Greenspan said it, there really was irrational exuberance in the market. Specifically, it's now widely accepted that there was a stock market *bubble*—a large upward movement in asset prices not based on rational factors such as fundamentals. But should Greenspan have done something about it? That's still very much a matter of debate; we'll revisit this question in Chapter 17. ■

>>QUICK REVIEW

- Financial market fluctuations can be a source of macroeconomic instability.
- Stock prices are driven by supply and demand as well as the desirability of competing assets like bonds. But they also reflect expectations about future stock prices. One view of expectations is the *efficient markets hypothesis*, which leads to the view that stock prices follow a *random walk*.
- Market participants and some economists question the efficient markets hypothesis. In practice, policy makers don't assume that they can outsmart the market, but they also don't assume that markets will always behave rationally.

>>CHECK YOUR UNDERSTANDING 9-3

1. What is the likely effect of each of the following events on the stock price of a company? Explain your answers.

a. The company announces that while profit is low this year, it has discovered a new line of business that will generate a high profit next year.

b. The company announces that although it had a high profit this year, that profit will be less than had been previously announced.

c. Other companies in the same industry announce that sales are unexpectedly slow this year.
d. The company announces that it is on track to meet its previously forecast profit target.

2. Assess the following statement: "Although many investors may be irrational, it is unlikely that over time they will behave irrationally in exactly the same way—such as always buying stocks the day after the Dow has risen by 1%."

Solutions appear at back of book.

• A LOOK AHEAD •

At this point we've completed our study of why savings and investment spending are a critical component of long-run economic growth. We've examined how savings and investment spending are generated in the economy and how they are allocated by a well-functioning financial system. Now it's time for us to turn to the business cycle—that is, to understand the fluctuations around the trend in long-run growth. Our next step, then, is to develop the Aggregate Supply-Aggregate Demand model, which we will use to analyze how the behavior of producers, consumers, and the government influences the economy's performance.

SUMMARY

1. Investment in physical capital is necessary for long-run economic growth. So in order for an economy to grow, it must channel savings into investment spending.
2. According to the **savings–investment spending identity,** savings and investment spending are always equal for the economy as a whole. The government is a source of savings when it runs a positive **budget balance,** also known as a **budget surplus;** it is a source of dissavings when it runs a negative budget balance, also known as a **budget deficit.** In a closed economy, savings is equal to **national savings,** the sum of private savings plus the budget balance. In an open economy, savings is equal to national savings plus **capital inflows** of foreign savings. A capital outflow, or negative capital inflow, occurs when savings flow abroad.
3. The hypothetical **loanable funds market** shows how loans from savers are allocated among borrowers with investment spending projects. In equilibrium, only those projects with a **rate of return** greater than or equal to the equilibrium **interest rate** will be funded. By showing how gains from trade between lenders and borrowers are maximized, the loanable funds market shows why a well-functioning financial system leads to greater long-run economic growth. It also shows how government borrowing to cover a budget deficit can lead to **crowding out** of private investment spending and, other things equal, lower economic growth.
4. Households invest their current savings or **wealth**—their accumulated savings—by purchasing assets. Assets come in the form of either a **financial asset,** a paper claim that entitles the buyer to future income from the seller, or a **physical asset,** a claim on a tangible object that gives the owner the right to dispose of it as desired. A financial asset is also a **liability** from the point of view of its seller. There are four main types of financial assets: **loans,** bonds, stocks, and **bank deposits.** Each of them serves a different purpose in addressing the three fundamental tasks of a financial system: reducing **transaction costs**—the cost of making a deal; reducing **financial risk**—uncertainty about future outcomes that involves financial gains and losses; and providing **liquid** assets—assets that can be quickly converted into cash (in contrast to **illiquid** assets, which can't).
5. Although many small and moderate-size borrowers use bank loans to fund investment spending, larger companies typically issue bonds. Business owners reduce their risk by selling stock. Although stocks usually generate a higher return than bonds, investors typically wish to reduce their risk by engaging in **diversification,** owning a wide range of assets whose returns are based on unrelated, or independent, events. Most people are risk-averse, viewing the loss of a given amount of money as a significant hardship while viewing the gain of an equal amount of money as a much less significant benefit.
6. **Financial intermediaries**—institutions such as **mutual funds, pension funds, life insurance companies,** and **banks**—are critical components of the financial system. Mutual funds and pension funds do allow small investors to diversify; and life insurance companies reduce risk.
7. A bank allows individuals to hold liquid bank deposits that are then used to finance illiquid loans. Banks can perform this mismatch because on average only a small fraction of depositors withdraw their savings at any one time. Banks are a key ingredient of long-run economic growth.

8. Financial market fluctuations can be a source of macroeconomic instability. Stock prices are determined by supply and demand as well as the desirability of competing assets, like bonds: when the interest rate rises, stock prices generally fall and vice versa. Expectations drive the supply of and demand for stocks: expectations of higher future prices push today's stock prices higher and expectations of lower future prices drive them lower. One view of how expectations are formed is the **efficient markets hypothesis,** which holds that the prices of financial assets embody all publicly available information. It implies that fluctuations are inherently unpredictable—they follow a **random walk.**
9. Many market participants and economists believe that, based on actual evidence, financial markets are not as rational as the efficient markets hypothesis claims. Such evidence includes the fact that stock price fluctuations are too great to be driven by fundamentals alone. Policy makers assume neither that markets always behave rationally nor that they can outsmart them.

KEY TERMS

Savings–investment spending identity, p. 211
Budget surplus, p. 212
Budget deficit, p. 212
Budget balance, p. 212
National savings, p. 212
Capital inflow, p. 214
Loanable funds market, p. 216
Interest rate, p. 216
Rate of return, p. 217
Crowding out, p. 220
Wealth, p. 222
Financial asset, p. 222
Physical asset, p. 222
Liability, p. 222
Transaction costs, p. 222
Financial risk, p. 223
Diversification, p. 224
Liquid, p. 225
Illiquid, p. 225
Loan, p. 225
Financial intermediary, p. 226
Mutual fund, p. 226
Pension fund, p. 227
Life insurance company, p. 227
Bank deposit, p. 227
Bank, p. 228
Efficient markets hypothesis, p. 231
Random walk, p. 231

PROBLEMS

1. Given the following information about the closed economy of Brittania, what is the level of investment spending and private savings, and what is the budget balance? What is the relationship among the three? Is national savings equal to investment spending? There are no government transfers.

GDP = $1,000 million
C = $850 million
T = $50 million
G = $100 million

2. Given the following information about the open economy of Regalia, what is the level of investment spending and private savings, and what are the budget balance and capital inflow? What is the relationship among the four? There are no government transfers.

GDP = $1,000 million
C = $850 million
T = $50 million
G = $100 million
X = $100 million
IM = $125 million

3. The accompanying table shows the percentage of GDP accounted for by private savings, investment spending, and capital inflow in the economies of Capsland and Marsalia. Capsland is currently experiencing a net capital inflow and Marsalia, a net capital outflow. What is the budget balance (as a percentage of GDP) in both countries? Are Capsland and Marsalia running a budget deficit or surplus?

	Capsland	Marsalia
Investment spending as a percentage of GDP	20%	20%
Private savings as a percentage of GDP	10	25
Capital inflow as a percentage of GDP	5	–2

4. Assume the economy is open. Answer each of the following questions.

a. X = $125 million
IM = $80 million
$S_{Government}$ = – $200 million
I = $350 million
Calculate $S_{Private}$.

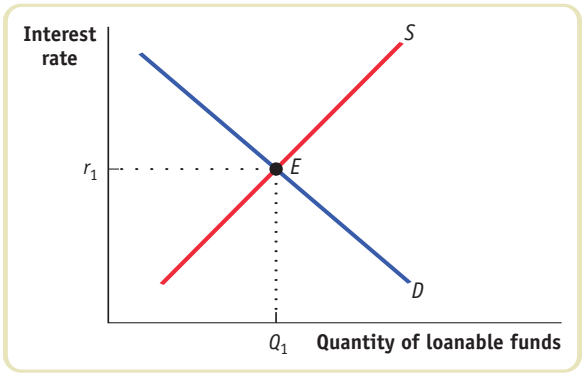
b. X = $85 million
IM = $135 million
$S_{Government}$ = $100 million
$S_{Private}$ = $250 million
Calculate I

c. X = $60 million
IM = $95 million
$S_{Private}$ = $325 million
I = $300 million
Calculate $S_{Government}$.

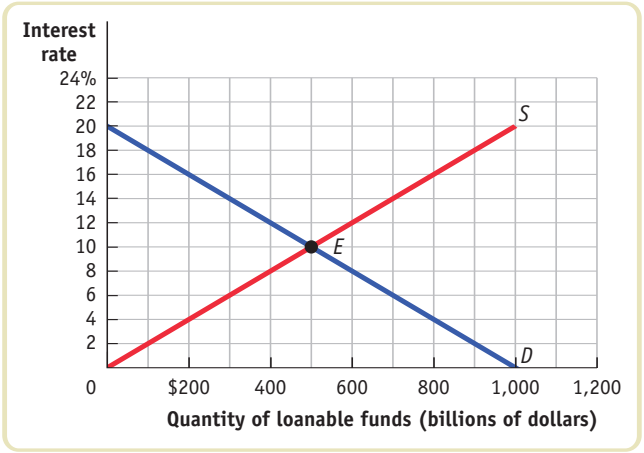
d. $S_{Private}$ = $325 million
I = $400 million
$S_{Government}$ = $10 million
Calculate $IM - X$.

5. Use the market for loanable funds shown in the accompanying diagram to explain what happens to private savings, private investment spending, and the rate of interest if the following events occur. Assume the economy is closed.

a. The government reduces the size of its deficit to zero.
b. At any given interest rate, consumers decide to save more. Assume the budget balance is zero.
c. At any given interest rate, businesses become very optimistic about the future profitability of investment spending. Assume the budget balance is zero.



6. The government is running a budget balance of zero when it decides to increase education spending by $200 billion and finance the spending by selling bonds. The accompanying diagram shows the market for loanable funds before the government sells the bonds. Assume the economy is closed. How will the equilibrium interest rate and the equilibrium quantity of loans change? Is there any crowding out in the market?



7. Explain why equilibrium in the loanable funds market maximizes efficiency.

8. How would you respond to a friend who claims that the government should eliminate all purchases that is financed by borrowing because such borrowing crowds out private investment spending?

9. Which of the following are examples of investment spending, investing in financial assets, or investing in physical assets?

a. Rubert Moneybucks buys 100 shares of existing Coca-Cola stock.
b. Rhonda Moviestar spends $10 million to buy a mansion built in the 1970s.
c. Ronald Basketballstar spends $10 million to build a new mansion with a view of the Pacific Ocean.
d. Rawlings builds a new plant to make catcher's mitts.
e. Russia buys $100 million in U.S. government bonds.

10. Explain how a well-functioning financial system increases savings and investment spending, holding the budget balance and any capital flows fixed.

11. What are the important types of financial intermediaries in the U.S. economy? What are the primary assets of these intermediaries, and how do they facilitate investment spending and saving?

12. Explain the effect on a company's stock price today of the following events, other things held constant.

a. The interest rate on bonds falls.
b. Several companies in the same sector announce surprisingly slow sales.
c. A change in the tax law passed last year reduces this year's profit.
d. The company unexpectedly announces that due to an accounting error, it must amend last year's accounting statement and reduce last year's reported profit by $5 million. It also announces that this change has no implications for future profits.

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