Savings, Investment Spending, and the Financial System

FUNDS FOR FACEBOOK

Facebook obtained millions of dollars in financing to pay for physical capital like the server farms it needed to expand.

“FACEBOOK IS HUNTING FOR More Money”—so read a 2009 headline in Business Week, which reported that the social networking site was seeking to borrow a $100 million credit line. Why would a wildly successful business like Facebook need to borrow money?

Everyone knows Facebook. Founded in 2004, it has gone on to become arguably the biggest business success story of the twenty-first century—so far. Currently, about 40% of Americans are reported to have Facebook pages. How did Facebook grow so big, so fast?

In large part, of course, the answer is that the company had a good idea. Personalized web pages providing information to friends turned out to be something many people really wanted. Equally important, since advertisers wanted access to the readers of those pages, Facebook could make a lot of money selling advertising space.

But having a good idea isn’t enough to build a business. Entrepreneurs need funds: you have to spend money to make money. Although businesses like Facebook seem to exist solely in the virtual world of cyberspace, free of the worldly burdens of brick-and-mortar establishments, the truth is that running such businesses requires a lot of very real and expensive hardware. Like Google, Yahoo!, and other Internet giants, Facebook maintains huge “server farms,” arrays of linked computers that track and process all the information needed to provide the user experience.

Where did Facebook get the money to equip these server farms? Some of it came from investors who acquired shares in the business, but much of it was borrowed. As Facebook grew bigger, so did the amount it borrowed.

The ability of Facebook to raise large sums of money to finance its growth is, in its own way, as remarkable as the company’s product. In effect, some young guy with a bright idea is able to lay his hands on hundreds of millions of dollars to build his business. It’s an amazing story.

Yet this sort of thing is common in modern economies all the time. The long-run growth we analyzed in the previous chapter 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 like Facebook would not be able to purchase much of the physical capital that is 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 spending projects such as railroads and factories. Today, financial systems channel funds into new sources of growth such as green technology, social media, 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 will examine the relationship between savings and investment spending. 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 spending projects to finance). Finally, we examine the behavior of financial markets and why they often resist economists’ attempts at explanation.
According to the **savings–investment spending identity**, savings and investment spending are always equal for the economy as a whole.

### Matching Up Savings and Investment Spending

We learned in the previous chapter 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 governments 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.

Who pays for private investment spending? In some cases it’s the people or corporations that actually do the spending—for example, a family that owns a business might use its own savings to buy new equipment or a new building, or a corporation might reinvest some of its own profits to build a new factory. In the modern economy, however, individuals and firms that create physical capital often do it with other people’s money—money that they borrow or raise by selling stock.

To understand how investment spending is financed, we need to look first at how savings and investment spending are related for the economy as a whole. Then we will examine how savings are allocated among investment spending projects.

### The Savings–Investment Spending Identity

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

To see why the savings-investment spending identity must be true, let's look again at the national income accounting that we learned in Chapter 22. Recall that GDP is equal to total spending on domestically produced final goods and services, and that we can write the following equation (which is the same as Equation 22-1):

\[
GDP = C + I + G + X - IM
\]

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 25-1 simpler. As we learned in Chapter 22, the overall income of this simplified economy would, by definition, equal total spending. Why? Recall one of the basic principles of economics from Chapter 1, that one person's spending is another person's income: the only way people can earn income is by selling something to someone else, and every dollar spent in the economy creates income for somebody. This is represented by Equation 25-2: on the left, GDP represents total income earned in the economy, and on the right, \( C + I + G \) represents total spending in the economy:

\[
(10-2) \quad GDP = C + I + G
\]

Total income = Total spending

Now, what can people do with income? Economic actors—consumers or government—can either spend it on consumption—consumer spending \( (C) \) plus government purchases of goods and service \( (G) \)—or save it \( (S) \). So it must be true that:
\[(10-3)\] GDP = C + G + S  
Total income = Consumption spending + Savings

where S is savings. Meanwhile, as Equation 25-2 tells us, total spending consists of either consumption spending (C + G) or investment spending (I):

\[(10-4)\] GDP = C + G + I  
Total income = Consumption spending + Investment spending

Putting Equations 25-3 and 25-4 together, we get:

\[(10-5)\] C + G + S = C + G + I  
Consumption spending = Consumption Spending + Savings + Investment spending

Subtract consumption spending (C + G) from both sides, and we get:

\[(10-6)\] S = I  
Savings = Investment spending

As we said, then, it's a basic accounting fact that savings equals investment spending for the economy as a whole.

Now, let's take a closer look at savings. 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 budget surplus. In this case, we often say that the government is "dis-saving" by spending more than its tax revenues, the government is engaged in the opposite of savings. We'll define the term *budget balance* to refer to both cases, with the understanding that the budget balance can be positive (a budget surplus) or negative (a budget deficit). The budget balance is defined as:

\[(10-7)\] S_{Government} = T - G - TR

Where \(T\) is the value of tax revenues and \(TR\) is the value of government transfers. The budget balance is equivalent to savings by government—if it's positive, the government is saving; if it's negative, the government is dis-saving. *National savings*, which we just called savings, for short, is equal to the sum of the budget balance and private savings, where private savings is disposable income (income after taxes) minus consumption. It is given by:

\[(10-8)\] S_{National} = S_{Government} + S_{Private}

So Equations 25-6 and 25-8 tell us that, in a closed economy, the savings-investment spending identity has the following form:

\[(10-9)\] S_{National} = I  
National savings = Investment

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 investment spending projects 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 that country. Any given country can also generate outflows of funds—domestic savings that finance investment spending in another 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 net capital inflow into that country, equal to the total inflow of foreign funds minus the total outflow of domestic funds to other countries. Like the budget balance, a net 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 positive net capital inflow from foreigners, who view our economy as an attractive place to put their savings. In 2010, for example, net capital inflows into the United States were $471 billion.

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 the country’s net capital inflow. As we will explain at greater length in Chapter 19, this means that the net capital inflow into a country is equal to the difference between imports and exports:

\[ NCI = IM - X \]

Net capital inflow = Imports − Exports

Re-arranging Equation 10-1 we get:

\[ I = (GDP - C - G) + (IM - X) \]

Using Equation 10-3 and 10-9 we know that GDP − C − G is equal to National savings, so that:

\[ I = S_{\text{National}} + (IM - X) = S_{\text{National}} + NCI \]

Investment spending = National savings + Net capital inflow

So the application of the savings–investment spending identity to an economy that is open to inflows or outflows of capital means that investment spending is equal to savings, where savings is equal to national savings plus net capital inflow. That is, in an economy with a positive net capital inflow, some investment spending is funded by the savings of foreigners. And in an economy with a negative net capital inflow (that is, more capital is flowing out than flowing in), some portion of national savings is funding investment spending in other countries. In the United States in 2010, investment spending totaled $2,300 billion. Private savings totaled $3,119 billion, offset by a government budget deficit of $1,299 billion and supplemented by a net capital inflow of $471 billion. Notice that these numbers

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 explained in the previous chapter):

1. Physical capital consists of manufactured resources such as buildings and machines.
2. Human capital is the improvement in the labor force generated by education and knowledge.
3. Financial capital is funds from savings that are available for investment spending. A country that has a positive net capital inflow is experiencing a flow of funds into the country from abroad that can be used for investment spending.
don’t quite add up; because data collection isn’t perfect, there is a “statistical discrepancy” of $9 billion. But we know that this is an error in the data, not in the theory, because the savings–investment spending identity must hold in reality.

It’s also worth noting that 2010 was not a normal year. As we have pointed out in previous chapters, in 2008 the U.S. economy (along with the economies of many other nations) was struck by a severe financial crisis. This crisis led both to a plunge in investment spending and to large government budget deficits, effects that have continued up until the time of writing. In much of the rest of this chapter we’ll focus on data from 2007, the last year before the crisis, because it gives a much better picture of what savings and investment look like in normal times.

Figure 10-1 shows what the savings–investment spending identity looked like in 2007 for two of the world’s largest economies, those of the United States and Japan. To make the two economies easier to compare, we’ve measured savings and investment spending as percentages of GDP. In each panel the orange bars on the left show total investment spending and the multi-colored bars on the right show the components of savings. U.S. investment spending was 18.8% of GDP, financed by a combination of private savings (15.7% of GDP) and positive net capital inflow or capital inflow (5.2% of GDP) and partly offset by a government budget deficit (−1.6% of GDP). (These numbers sum to more than 18.8% due to statistical discrepancy.) Japanese investment spending was higher as a percentage of GDP, at 23.8%. It was financed by a higher level of private savings as a percentage of GDP (32.1%) and was offset by both a negative net capital inflow or capital outflow (−4.9% of GDP) and a budget deficit (−3.4% of GDP).

The economy’s savings finance its investment spending. But how are these funds that are available for investment spending allocated among various projects? That is, what determines which projects get financed (such as Facebook’s...
server farms) and which don’t (such as Microsoft’s Courier tablet computer, an innovative concept that the software giant decided not to pursue)? We’ll see shortly that funds get allocated to investment spending projects using a familiar method: by the market, via supply and demand.

This figure shows national savings as a percentage of GDP for seven wealthy economies in 2007. (Again, we focus on 2007 as the last pre-crisis year). The United States had the lowest savings rate, although Britain’s savings were only slightly higher. In this respect, 2007 wasn’t unusual. The United States has had consistently low national savings compared with other wealthy countries since the 1980s. The main source of these international differences in national savings lies in low U.S. private savings rather than in large U.S. government budget deficits.

Why do Americans save so little? The short answer is that economists aren’t sure, although there are a number of theories. One is that consumers have easier access to credit in the United States than elsewhere. For example, Japanese lenders have traditionally demanded large down payments from home-buyers; but, until the recent housing bust, it was possible for Americans to buy homes with little or no money down.

It’s also argued that the U.S. Social Security system, by providing guaranteed income in retirement, may reduce the incentive for private saving. In any case, the United States has been able to maintain high levels of investment spending in spite of its low savings rate because it receives large positive net capital inflows.

The savings–investment spending identity is a fact of accounting. By definition, savings equals 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—say, by putting off the purchase of new cars. The immediate effect will be that unsold goods pile up—in this case, in the form of cars sitting in dealers’ lots. And this increase in inventory counts as investment spending, albeit unintended. So the savings–investment spending identity still holds, because auto dealers 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 quarters of 2001. But on the investment spending side, $71 billion of that fall took the form of negative inventory investment spending. In particular, car dealers sold many of the vehicles that had been sitting on their lots.

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 Chapter 11.
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.

To do this, it helps to consider a somewhat simplified version of reality. 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 $r$. As we noted in Chapter 8, loans typically specify a nominal interest rate. So although we call $r$ “the interest rate,” it is with the understanding that $r$ is a nominal interest rate—an interest rate that is unadjusted for inflation.

We’re not quite done simplifying things. 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.

OK, now we’re ready to analyze how savings and investment get matched up.

The Demand for Loanable Funds

Figure 10-2 illustrates a hypothetical demand curve for loanable funds, $D$, which slopes downward. On the horizontal axis we show the quantity of loanable funds demanded. On the vertical axis
The present value of \( X \) is the amount of money needed today in order to receive \( X \) at a future date given the interest rate.

We show the interest rate, which is the “price” of borrowing. But why does the demand curve for loanable funds slope downward?

To answer this question, consider what a firm is doing when it engages in investment spending—say, by buying new equipment. Investment spending means laying out money right away, expecting that this outlay will lead to higher profits at some point in the future. In fact, however, the promise of a dollar five or ten years from now is worth less than an actual dollar right now. So an investment is worth making only if it generates a future return that is greater than the monetary cost of making the investment today. How much greater? To answer that, we need to take into account the present value of the future return the firm expects to get. We examine the concept of present value in the accompanying For Inquiring Minds. Then, in the chapter’s appendix, we show how the concept of present value can be applied to dollars earned multiple years in the future.

In present value calculations, we use the interest rate to determine how the value of a dollar in the future compares to the value of a dollar today. But the fact is that future dollars are worth less than a dollar today, and they are

**FOR INQUIRING MINDS**

**USING PRESENT VALUE**

An understanding of the concept of present value shows why the demand curve for loanable funds slopes downward. A simple way to grasp the essence of present value is to consider an example that illustrates the difference in value between having a sum of money today and having the same sum of money a year from now.

Suppose that exactly one year from today you will graduate, and you want to reward yourself by taking a trip that will cost $1,000. In order to have $1,000 a year from now, how much do you need today? It’s not $1,000, and the reason why depends on the interest rate. Let’s call the amount you need today \( X \). We’ll use \( r \) to represent the interest rate you receive on funds deposited in the bank. If you put \( X \) into the bank today and earn interest rate \( r \) on it, then after one year, the bank will pay you \( X \times (1 + r) \). If what the bank will pay you a year from now is equal to $1,000, then the amount you need today is \( X \times (1 + r) = 1,000 \).

You can apply some basic algebra to find that

\[
X = \frac{1,000}{1 + r}
\]

Notice that the value of \( X \) depends on the interest rate \( r \), which is always greater than 0. This fact implies that \( X \) is always less than $1,000. For example, if \( r = 5\% \) (that is, \( r = 0.05 \)), then \( X = 952.38 \). In other words, having $952.38 today is equivalent to having $1,000 a year from now.

Think about a firm that has two potential investment projects in mind, each of which will yield $1,000 a year from now. However, each project has different initial costs—say, one requires that the firm borrow $900 right now and the other requires that the firm borrow $950. Which, if any, of these projects is worth borrowing money to finance and undertake?

The answer depends on the interest rate, which determines the present value of $1,000 a year from now. If the interest rate is 10%, the present value of $1,000 delivered a year from now is $909. So only the first project, which has an initial cost of less than $909, is profitable. With an interest rate of 10%, the return on any project costing more than $909 is less than the amount the firm had to repay on its loan and is therefore unprofitable. If the interest rate is only 5%, however, the present value of $1,000 rises to $952. At this interest rate, both projects are profitable because $952 exceeds both projects’ initial cost. So a firm will borrow more and engage in more investment spending when the interest rate is lower.

Meanwhile, similar calculations will be taking place at other firms. So a lower interest rate will lead to higher investment spending in the economy as a whole: the demand curve for loanable funds slopes downward.
worth even less when the interest rate is higher. The intuition behind present value calculations is simple. The interest rate measures the opportunity cost of investment spending that results in a future return: instead of spending money on an investment spending project, a company could simply put the money into the bank and earn interest on it. And the higher the interest rate, the more attractive it is to simply put money into the bank instead of investing it in an investment spending project. In other words, the higher the interest rate, the higher the opportunity cost of investment spending. And, the higher the opportunity cost of investment spending, the lower the number of investment spending projects firms want to carry out, and therefore the lower the quantity of loanable funds demanded. It is this insight (discussed in the accompanying For Inquiring Minds) that explains why the demand curve for loanable funds is downward sloping.

When businesses engage in investment spending, they spend money right now in return for an expected payoff in the future. So, to evaluate whether a particular investment spending project is worth undertaking, a business must compare the present value of the future payoff with the current cost of that project. If the present value of the future payoff is greater than the current cost, a project is profitable and worth investing in. If the interest rate falls, then the present value of any given project rises, so more projects pass that test. If the interest rate rises, then the present value of any given project falls, then fewer projects pass that test. So total investment spending, and hence the demand for loanable funds to finance that spending, is negatively related to the interest rate. Thus, the demand curve for loanable funds slopes downward. You can see this in Figure 10-2. When the interest rate falls from 12% to 4%, the quantity of loanable funds demanded rises from $150 billion (point A) to $450 billion (point B).

The Supply of Loanable Funds Figure 10-3 shows a hypothetical supply curve for loanable funds, \( S \). Again, the interest rate plays the same role that the price plays in ordinary supply and demand analysis. But why is this curve upward sloping?

**FIGURE 10-3 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. Here, increasing the interest rate from 4% to 12% increases the quantity of loanable funds supplied from $150 billion to $450 billion.
The answer is that loanable funds are supplied by savers, and savers incur an opportunity cost when they lend to a business: the funds 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 the loan you made is repaid with interest. So it is a good assumption that more people are willing to forgo current consumption and make a loan to a borrower when the interest rate is higher. As a result, our hypothetical supply curve of loanable funds slopes upward. In Figure 10-3, 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).

**The Equilibrium Interest Rate**

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 10-4, 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. In this equilibrium, only investment spending projects that are profitable if the interest rate is 8% or higher are funded. Projects that would not be undertaken unless they are profitable only when the interest rate falls below 8% are not funded. Correspondingly, only lenders who are willing to accept an interest rate of 8% or less will have their offers to lend funds accepted; lenders who demand an interest rate higher than 8% do not have their offers to lend accepted.

Figure 10-4 shows how the market for loanable funds matches up desired savings with desired investment spending: in equilibrium, the quantity of funds that savers want to lend is equal to the quantity of funds that firms want to borrow. The figure also shows that this match-up is efficient, in two senses.

**FIGURE 10-4 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. 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. Projects that are profitable at an interest rate of 8% or higher are funded; those that are profitable only when the interest rate falls below 8% are not.
First, the right investments get made: the investment spending projects that are actually financed have higher payoffs (in terms of present value) than those that do not get financed. Second, the right people do the saving and lending: the savers who actually lend funds are willing to lend for lower interest rates than those who do not.

The insight that the loanable funds market leads to an efficient use of savings, 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 long-run economic growth rate.

Before we get to that let’s look at how the market for loanable funds responds to shifts of demand and supply. As in the standard model of supply and demand, where the equilibrium price changes in response to shifts of the demand or supply curves, here, the equilibrium interest rate changes when there are shifts of the demand curve for loanable funds, the supply curve for loanable funds, or both.

**Shifts of the Demand for Loanable Funds** Let’s start by looking at the causes and effects of changes in demand.

The factors that can cause the demand curve for loanable funds to shift include the following:

1. *Changes in perceived business opportunities.* A change in beliefs about the payoff of investment spending can increase or reduce the amount of desired spending at any given interest rate. For example, during the 1990s there was great excitement over the business possibilities created by the Internet, which had just begun to be widely used. As a result, businesses rushed to buy computer equipment, put fiber-optic cables in the ground, and so on. This shifted the demand for loanable funds to the right. By 2001, the failure of many dot-com businesses had led to disillusionment with technology-related investment; this shifted the demand for loanable funds back to the left.

2. *Changes in government borrowing.* A government runs a budget deficit when, in a given year, it spends more than it receives. A government that runs budget deficits can be a major source of demand for loanable funds. As a result, changes in the government budget deficit can shift the demand curve for loanable funds. For example, between 2000 and 2003, as the U.S. federal government went from a budget surplus to a budget deficit, the government went from being a net saver that provided loanable funds to the market to being a net borrower, borrowing funds from the market. In 2000, net federal borrowing was **minus** $189 billion as the federal government was paying off some of its pre-existing debt. But by 2003, net federal borrowing was **plus** $416 billion because the government had to borrow large sums to pay its bills. This change in the federal budget position had the effect, other things equal, of shifting the demand curve for loanable funds to the right.

Figure 10-5 shows the effects of an increase in the demand for loanable funds. \( S \) is the supply of loanable funds, and \( D_1 \) is the initial demand curve. The initial equilibrium interest rate is \( r_1 \). An increase in the demand for loanable funds means that the quantity of funds demanded rises at any given interest rate, so the demand curve shifts rightward to \( D_2 \). As a result, the equilibrium interest rate rises to \( r_2 \).

The fact that an increase in the demand for loanable funds leads, other things equal, to a rise in the interest rate has one especially important implication: it tells us that increasing or persistent government budget deficits
are cause for concern because an increase in the government’s deficit shifts
the demand curve for loanable funds to the right, which leads to a higher
interest rate. If the interest rate rises, businesses will cut back on their
investment spending. So, other things equal, a rise in the government bud-
get deficit tends to reduce overall investment spending. Economists call the
negative effect of government budget deficits on investment spending crowding out. Concerns about crowding out are one key reason to worry about
increasing or persistent budget deficits.

However, it’s important to add a qualification here: crowding out may not
occur if the economy is depressed. When the economy is operating far below
full employment, government spending can lead to higher incomes; and these
higher incomes lead to increased savings at any given interest rate. Higher
savings allows the government to borrow without raising interest rates. Many
economists believe, for example, that the large budget deficits that the U.S.
government ran from 2008 to 2012 (the time of writing), in the face of a
depressed economy, caused little if any crowding out.

Shifts of the Supply of Loanable Funds Like the demand for loanable
funds, the supply of loanable funds can shift. Among the factors that can cause
the supply of loanable funds to shift are the following:

1. Changes in private savings behavior. A number of factors can cause the
level of private savings to change at any given interest rate. For example,
between 2000 and 2006 rising home prices in the United States made
many homeowners feel richer, making them willing to spend more and
save less. This had the effect of shifting the supply curve of loanable
funds to the left.

2. Changes in net capital inflows. Capital flows into and out of a country can
change as investors’ perceptions of that country change. For example, Greece
experienced large net capital inflows after the creation of the euro, Europe’s
common currency, in 1999, because investors believed that Greece’s adop-
tion of the euro as its currency had made it a safe place to put their funds.
By 2009, however, worries about the Greek government’s solvency (and the

**Crowding out** occurs when a government deficit drives up the
interest rate and leads to reduced investment spending.
discovery that it had been understating its debt) led to a collapse in investor confidence, and the net inflow of funds dried up. The effect of shrinking capital inflows was to shift the supply curve in the Greek loanable funds market to the left.

As we’ve already seen, the United States has received large net capital inflows in recent years, with much of the money coming from China and the Middle East. Those inflows helped fuel a big increase in residential investment spending—newly constructed homes—from 2003 to 2006. As a result of the bursting of the U.S. housing bubble in 2008 and the subsequent deep recession, those inflows began to trail off in 2008.

Figure 10-6 shows the effects of an increase in the supply of loanable funds. \( D \) is the demand for loanable funds, and \( S_1 \) is the initial supply curve. The initial equilibrium interest rate is \( r_1 \). An increase in the supply of loanable funds means that the quantity of funds supplied rises at any given interest rate, so the supply curve shifts rightward to \( S_2 \). As a result, the equilibrium interest rate falls to \( r_2 \).

**Inflation and Interest Rates** Anything that shifts either the supply of loanable funds curve or the demand for loanable funds curve changes the interest rate. Historically, major changes in interest rates have been driven by many factors, including changes in government policy and technological innovations that created new investment opportunities. However, arguably the most important factor affecting interest rates over time—the reason, for example, that interest rates today are much lower than they were in the late 1970s and early 1980s—is changing expectations about future inflation, which shift both the supply and the demand for loanable funds.

To understand the effect of expected future inflation on interest rates, recall our discussion in Chapter 8 of the way inflation creates winners and losers—for example, the way that higher than expected U.S. inflation in the 1970s and 1980s reduced the real value of homeowners’ mortgages, which...
was good for the homeowners but bad for the banks. In Chapter 8 we learned that economists summarize the effect of inflation on borrowers and lenders by distinguishing between the nominal interest rate and the real interest rate, where the difference is:

\[ \text{Real interest rate} = \text{Nominal interest rate} - \text{Inflation rate} \]

The true cost of borrowing is the real interest rate, not the nominal interest rate. To see why, suppose a firm borrows $10,000 for one year at a 10% nominal interest rate. At the end of the year, it must repay $11,000—the amount borrowed plus the interest. But suppose that over the course of the year the average level of prices increases by 10%, so that the real interest rate is zero. Then the $11,000 repayment has the same purchasing power as the original $10,000 loan. In real terms, the borrower has received a zero-interest loan.

Similarly, the true payoff to lending is the real interest rate, not the nominal rate. Suppose that a bank makes a $10,000 loan for one year at a 10% nominal interest rate. At the end of the year, the bank receives an $11,000 repayment. But if the average level of prices rises by 10% per year, the purchasing power of the money the bank gets back is no more than that of the money it lent out. In real terms, the bank has made a zero-interest loan.

Now we can add an important detail to our analysis of the loanable funds market. Figures 10-5 and 10-6 are drawn with the vertical axis measuring the nominal interest rate for a given expected future inflation rate. Why do we use the nominal interest rate rather than the real interest rate? Because in the real world neither borrowers nor lenders know what the future inflation rate will be when they make a deal. Actual loan contracts therefore specify a nominal interest rate rather than a real interest rate. Because we are holding the expected future inflation rate fixed in Figures 10-5 and 10-6, however, changes in the nominal interest rate also lead to changes in the real interest rate.

The expectations of borrowers and lenders about future inflation rates are normally based on recent experience. In the late 1970s, after a decade of high inflation, borrowers and lenders expected future inflation to be high. By the late 1990s, after a decade of fairly low inflation, borrowers and lenders expected future inflation to be low. And these changing expectations about future inflation had a strong effect on the nominal interest rate, largely explaining why nominal interest rates were much lower in the early years of the twenty-first century than they were in the early 1980s.

Let’s look at how changes in the expected future rate of inflation are reflected in the loanable funds model.

In Figure 10-7, the curves $S_0$ and $D_0$ show the supply and demand for loanable funds given that the expected future rate of inflation is 0%. In that case, equilibrium is at $E_0$ and the equilibrium nominal interest rate is 4%. Because expected future inflation is 0%, the equilibrium expected real interest rate over the life of the loan is also 4%.

Now suppose that the expected future inflation rate rises to 10%. The demand curve for loanable funds shifts upward to $D_{10}$: borrowers are now willing to borrow as much at a nominal interest rate of 14% as they were previously willing to borrow at 4%. That’s because with a 10% inflation rate, a 14% nominal interest rate corresponds to a 4% real interest rate. Similarly, the supply curve of loanable funds shifts upward to $S_{10}$: lenders require a nominal interest rate of 14% to persuade them to lend as much as they would previously have lent at 4%. The new equilibrium is at $E_{10}$: the result of an expected future inflation rate of 10% is that the equilibrium nominal interest rate rises from 4% to 14%.
This situation can be summarized as a general principle, known as the **Fisher effect** (after the American economist Irving Fisher, who proposed it in 1930): *The expected real interest rate is unaffected by changes in expected future inflation.* According to the Fisher effect, an increase in expected future inflation drives up the nominal interest rate, where each additional percentage point of expected future inflation drives up the nominal interest rate by 1 percentage point. The central point is that both lenders and borrowers base their decisions on the expected real interest rate. As a result, a change in the expected rate of inflation does not affect the equilibrium quantity of loanable funds or the expected real interest rate; all it affects is the equilibrium nominal interest rate.

**ECONOMICS IN ACTION**

**FIFTY YEARS OF U.S. INTEREST RATES**

There have been some large movements in U.S. interest rates over the past half-century. These movements clearly show how both changes in expected future inflation and changes in the expected return on investment spending move interest rates.

Panel (a) of Figure 10-8 illustrates the first effect. It shows the average interest rate on bonds issued by the U.S. government—specifically, bonds for which the government promises to repay the full amount after 10 years—from 1960 to mid-2011, along with the rate of consumer price inflation over the same period. As you can see, the big story about interest rates is the way they soared in the 1970s, before coming back down in the 1980s. It's not hard to see why that happened: inflation shot up during the 1970s, leading to widespread expectations that high inflation would continue. And as we've seen, expected inflation raises the equilibrium interest rate. As inflation came down in the 1980s, so did expectations of future inflation, and this brought interest rates down as well.

According to the Fisher effect, an increase in expected future inflation drives up the nominal interest rate, leaving the expected real interest rate unchanged.
PART 4 LONG-RUN ECONOMIC GROWTH

Panel (b) illustrates the second effect: changes in the expected return on investment spending and interest rates, with a “close-up” of interest rates from 2002 to 2011. Notice the rise in interest rates during the middle years of the last decade, followed by a sharp drop. We know from other evidence (such as surveys of investor opinion) that expected inflation didn’t change much over those years. What happened, instead, was the boom and bust in housing: interest rates rose as demand for housing soared, pushing the demand curve for loanable funds to the right, then fell as the housing boom collapsed, shifting the demand curve for loanable funds back to the left.

Throughout this whole process, total savings was equal to total investment spending, and the rise and fall of the interest rate played a key role in matching lenders with borrowers.

**CHECK YOUR UNDERSTANDING 10-1**

1. Use a diagram of the loanable funds market to illustrate the effect of the following events on the equilibrium interest rate and investment spending.
   a. An economy is opened to international movements of capital, and a net 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.
   c. Suppose that expected inflation rises from 3% to 6%.
      a. How will the real interest rate be affected by this change?
      b. How will the nominal interest rate be affected by this change?
      c. What will happen to the equilibrium quantity of loanable funds?

Solutions appear at back of book.
The Financial System

A well-functioning financial system that brought together the funds of investors and the ideas of brilliant nerds made the rise of Facebook possible. But to think that this is an exclusively modern phenomenon would be 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 and early nineteenth centuries. 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. These features are no less relevant today. So let’s begin by understanding exactly what is traded in financial markets.

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 of the financial asset) to future income from the company. A household can also invest its current savings or wealth by purchasing a physical asset, a tangible object that can be used to generate future income 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 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 investing in a physical asset. In contrast, 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. (See the Pitfalls on investment versus investment spending that appears earlier in the chapter.)

If you get a loan from your local bank—say, to buy a new car—you and the bank are 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 are also 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 four types of financial assets—loans, stocks, bonds and bank deposits—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 make society as a whole richer. We’ll turn now to examining how financial assets are designed and how institutions are developed to cope with these problems.

**Task 1: Reducing Transaction Costs** Transaction costs are the expenses of actually putting together and executing 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 $1 billion 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.

**Task 2: Reducing Risk** A second problem that real-world borrowers and lenders face is financial risk, uncertainty about future outcomes that involve financial losses or gains. Financial risk, or simply risk, is a problem because the future is uncertain, 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: most people experience the loss in welfare from losing a given amount of money more intensely than they experience the increase in welfare from gaining the same amount of money. A person who is more sensitive to loss than to gain of equal dollar amounts is called risk-averse.

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.

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 a greater profit if she buys additional capital equipment, but she 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 due to uncertainty about 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 her 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,
a financial 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 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.

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 on types of financial assets, we’ll explain in more detail how certain features of the stock market increase the ability of individuals to manage and reduce risk.

**Task 3: 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, 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 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 lending it to a business.

An asset is liquid if it can be quickly converted into cash with relatively little loss of value. An asset is illiquid if it cannot. As we’ll see, stocks and bonds are a partial answer to the problem of liquidity. Banks provide an additional way for individuals to hold liquid assets and still finance illiquid investment spending projects.

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?

**Types of Financial Assets**

In the modern economy there are four main types of financial assets: loans, bonds, stocks, and bank deposits. In addition, financial innovation has allowed the creation of a wide range of loan-backed securities. Each serves a somewhat different purpose. We’ll examine loans, bonds, stocks, and loan-backed securities now, reserving our discussion of bank deposits until the following section.

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

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.
A **default** occurs when a borrower fails to make payments as specified by the loan or bond contract.

A **loan-backed security** is an asset created by pooling individual loans and selling shares in that pool.

**Bonds** As we learned in Chapter 7, a bond is an IOU issued by the borrower. Normally, the seller of the bond promises to pay a fixed sum of interest each year and to repay the principal—the value stated on the face of the bond—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. A particular concern for investors is the possibility of **default**, the risk that the bond issuer will fail to make payments as specified by the bond contract. Once a bond's risk of default has been rated, it can be sold on the bond market as a more or less standardized product—a product with clearly defined terms and quality. In general, bonds with a higher default risk must pay a higher interest rate to attract investors.

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.

**Loan-Backed Securities** Loan-backed securities, assets created by pooling individual loans and selling shares in that pool (a process called **securitization**), have become extremely popular over the past two decades. While mortgage-backed securities, in which thousands of individual home mortgages are pooled and shares sold to investors, are the best-known example, securitization has also been widely applied to student loans, credit card loans, and auto loans. These loan-backed securities are traded on financial markets like bonds; they are preferred by investors because they provide more diversification and liquidity than individual loans. However, with so many loans packaged together, it can be difficult to assess the true quality of the asset. That difficulty came to haunt investors during the financial crisis of 2008, when the bursting of the housing bubble led to widespread defaults on mortgages and large losses for holders of “supposedly safe” mortgage-backed securities, pain that spread throughout the entire financial system.

**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 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-eleven billionth of the company's profit, as well as 1 of 11 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 complete 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 sole owner 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.” And 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 bondholders—its lenders—while 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 simultaneously manage risk and enjoy somewhat higher returns. It does that through the services of institutions known as financial intermediaries.

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 accepting 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 stock—assets such as bonds, real estate, and cash. (And, for good measure, to have plenty of insurance in case of accidental losses!)

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 stockbrokers) because they are buying a few shares of a lot of companies. Fortunately for such investors, mutual funds help 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 selling 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 10-1 shows an example of a diversified mutual fund, the Vanguard 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 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. In total, U.S. mutual

<p>| Table 10-1 Vanguard 500 Index Fund Investor Shares, Top Holdings (as of June 2011) |</p>
<table>
<thead>
<tr>
<th>Company</th>
<th>Percent of mutual fund assets invested in a company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exxon Mobil Corp.</td>
<td>3.3%</td>
</tr>
<tr>
<td>Apple Inc.</td>
<td>2.6%</td>
</tr>
<tr>
<td>International Business Machines Corp.</td>
<td>1.7%</td>
</tr>
<tr>
<td>Chevron Corp.</td>
<td>1.7%</td>
</tr>
<tr>
<td>General Electric Co.</td>
<td>1.7%</td>
</tr>
<tr>
<td>Microsoft Corp.</td>
<td>1.6%</td>
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<tr>
<td>AT&amp;T Inc.</td>
<td>1.5%</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>1.5%</td>
</tr>
<tr>
<td>Procter &amp; Gamble Co.</td>
<td>1.5%</td>
</tr>
<tr>
<td>Pfizer Inc.</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

Source: The Vanguard Group.
A pension fund is a type of mutual fund that holds assets in order to provide retirement income to its members.

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

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

Mutual funds had assets of $10.1 trillion in late 2011. In December 2011, the largest mutual fund company was The Vanguard Group, which managed $1.7 trillion in funds.

We should mention, by the way, that mutual funds charge fees for their services. These fees are quite small for mutual funds that simply hold a diversified portfolio of stocks, without trying to pick winners. But the fees charged by mutual funds that claim to have special expertise in investing your money can be quite high.

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. In late 2011, pension funds in the United States held almost $10 trillion in assets.

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.

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, 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 investment spending needs of borrowers.

In essence, a bank is engaging in a kind of mismatch: lending for long periods of time while 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, if a bank becomes financially incapable of paying its depositors, individual bank deposits are guaranteed to depositors up
to $250,000 by the Federal Deposit Insurance Corporation, or FDIC, a federal agency. This reduces the risk to a depositor of holding a bank deposit, in turn reducing 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 depositors’ 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**

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 by government regulation at a time when the country was experiencing high 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. 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 seven-fold, 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 spending 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.

**CHECK YOUR UNDERSTANDING 10-2**

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 is a source of instability in the short run. In fact, the financial consequences of a sharp fall in housing prices became a major problem for economic policy makers starting in the summer of 2007. By the fall of 2008, it was clear that the U.S. economy was facing a severe slump as it adjusted to the consequences of greatly reduced home values. And in 2012, the time of writing, the economy was only slowly recovering from a severe recession.

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

The Demand for Stocks

Once a company issues shares of stock to investors, those shares can then be resold 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 summary measures of stock prices like the Dow Jones Industrial Average. These fluctuations reflect changes in 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

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 indices. 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, is an index of the prices of stock in 30 leading companies, such as Microsoft, Walmart, 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 company Sirius XM Radio or the computer manufacturer Dell.

Because these indices 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,” traditional business powerhouses like Exxon Mobil. The NASDAQ is heavily influenced by technology stocks. The S&P 500, a broad measure, is in between.

Why are these indices 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 indices reflects the fact that investors are acting on their beliefs by selling stocks in the Dow and buying stocks in the NASDAQ.

Dramatic fluctuations of the Dow, NASDAQ, S&P 500, and stock market indices early in 2011 suggested that the world might be facing another major economic crisis. The expressions on the faces of these stockbrokers were another indicator.
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. First, many financial assets provide regular income to their owners in the form of interest payments or dividends. But many companies don’t pay dividends; instead, they retain their earnings to finance future investment spending. Investors purchase non-dividend-paying stocks in the belief that they will earn 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. If investors believe that it will be worth more in the future, they will demand more of the asset today at any given price; consequently, 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; consequently, today’s equilibrium price of the asset will fall. 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 forecasts higher than expected profitability due to torrential sales of the latest version of the iPad. 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, 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, Home Depot announces that it expects lower profitability because the slump in home sales has depressed the demand for home improvements. Demand for Home Depot shares will decrease. At the same time, supply will increase because existing shareholders will be more willing to supply their Home Depot shares to the market. Both changes lead to a fall in the stock price.

So stock prices are determined by the supply and demand for shares—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 early on, 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 bonds becomes more attractive due to a rise in interest rates, stock prices will fall. And when purchasing bonds becomes less attractive due to a fall in interest rates, stock prices will rise.

The Demand for Other Assets
Everything we’ve just said about stocks applies to other assets as well, including physical assets. Consider the demand for commercial real estate—office buildings, shopping malls, and other structures that provide space for business activities. An investor who buys an office building does so for two reasons. First, because space in the building can be rented out, the owner of the building receives income in the form of rents. Second, the investor may expect the building to rise in value, meaning that it can be sold at a higher price at some future date. As in the case of stocks, the demand for commercial real estate also depends on the attractiveness of substitute assets, especially bonds. When interest rates rise, the demand for commercial real estate decreases; when interest rates fall, the demand for commercial real estate increases.
Most Americans don’t own commercial real estate. Only half of the population owns any stock, even indirectly through mutual funds, and for most of those people stock ownership is well under $50,000. However, at the end of 2011 about 66% of American households owned another kind of asset: their own homes. What determines housing prices?

You might wonder whether home prices can be analyzed the same way we analyze stock prices or the price of commercial real estate. After all, stocks pay dividends, commercial real estate yields rents, but when a family lives in its own home, no money changes hands.

In economic terms, however, that doesn’t matter very much. To a large extent, the benefit of owning your own home is the fact that you don’t have to pay rent to someone else—or, to put it differently, it’s as if you were paying rent to yourself. In fact, the U.S. government includes “implicit rent”—an estimate of the amount that homeowners, in effect, pay to themselves—in its estimates of GDP.

The amount people are willing to pay for a house depends in part on the implicit rent they expect to receive from that house. The demand for housing, like the demand for other assets, also depends on what people expect to happen to future prices: they’re willing to pay more for a house if they believe they can sell it at a higher price sometime in the future. Last but not least, the demand for houses depends on interest rates: a rise in the interest rate increases the cost of a mortgage and leads to a decrease in housing demand; a fall in the interest rate reduces the cost of a mortgage and causes an increase in housing demand.

All asset prices, then, are determined by a similar set of factors. But we haven’t yet fully answered the question of what determines asset prices because we haven’t explained what determines investors’ expectations about future asset prices.

**Asset Price Expectations**

There are two principal competing views about how asset 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 Home Depot’s 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 shopping habits of the American public and the prospects for home remodeling. You would also want to compare the earnings you could expect to receive from Home Depot 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 Home Depot stock is already selling in the market. Why? Because all publicly available information about Home Depot’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 indicates a profit opportunity to smart investors, who then sell Home Depot stock if it looks overpriced and buy it if it looks 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.

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
BEHAVIORAL FINANCE

Individuals often make irrational—sometimes predictably irrational—choices that leave them worse off economically than would other, feasible alternatives. People also have a habit of repeating the same decision-making mistakes. This kind of behavior is the subject of behavioral economics, which includes the rapidly growing subfield of behavioral finance, the study of how investors in financial markets often make predictably irrational choices.

Like most people, investors depart from rationality in systematic ways. In particular, they are prone to overconfidence, as in having a misguided faith that they are able to spot a winning stock; to loss aversion, being unwilling to sell an unprofitable asset and accept the loss; and to a herd mentality, buying an asset when its price has already been driven high and selling it when its price has already been driven low.

This irrational behavior raises an important question: can investors who are rational make a lot of money at the expense of those investors who aren’t—for example, by buying a company’s stock if irrational fears make it cheap?

The answer to this question is sometimes yes and sometimes no. Some professional investors have made huge profits by betting against irrational moves in the market (buying when there is irrational selling and selling when there is irrational buying). For example, the billionaire hedge fund manager John Paulson made $4 billion by betting against subprime mortgages during the U.S. housing bubble of 2007–2008 because he understood that financial assets containing subprime mortgages were being sold at inflated prices.

But sometimes even a rational investor cannot profit from market irrationality. For example, a money manager has to obey customers’ orders to buy or sell even when those actions are irrational. Likewise, it can be much safer for professional money managers to follow the herd: If they do that and their investments go badly, they have the career-saving excuse that no one foresaw a problem. But if they’ve gone against the herd and their investments go south, they are likely to be fired for making poor choices. So rational investors can even exacerbate the irrational moves in financial markets.

Some observers of historical trends hypothesize that financial markets are characterized by alternating periods of complacency and forgetfulness, which breed bubbles as investors irrationally believe that prices can only go up, followed by a crash, which in turn leads investors to avoid financial markets altogether and renders asset prices irrationally cheap. Clearly, the events of the past decade, with its huge housing bubble followed by extreme turmoil in financial markets, have given researchers in the area of behavioral finance a lot of material to work with.

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.

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 trade in 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 surefire 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 Home Depot stock plunges from $40 to $10 because of a sudden change in buying patterns, this doesn’t mean that the market was inefficient in originally

A random walk is the movement over time of an unpredictable variable.
pricing the stock at $40. The fact that buying patterns 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. The same appears to be true of other assets, especially housing: the great housing bubble, described in the Economics in Action that follows this section, arose in large part because homebuyers assumed that home prices would continue rising in the future.

**Asset Prices and Macroeconomics**

How should macroeconomists and policy makers deal with the fact that asset prices fluctuate a lot and that these fluctuations can have important economic effects? This question has become one of the major problems facing macroeconomic policy. On one side, policy makers are reluctant to assume that the market is wrong—that asset prices are either too high or too low. In part, this reflects the efficient markets hypothesis, which says that any information that is publicly available is already accounted for in asset prices. More generally, it’s hard to make the general case that government officials are better judges of appropriate prices than private investors who are putting their own money on the line.

On the other side, the past 15 years were marked by not one but two huge asset bubbles, each of which created major macroeconomic problems when it burst. In the late 1990s the prices of technology stocks, including but not limited to dot-com Internet firms, soared to hard-to-justify heights. When the bubble burst, these stocks lost, on average, two-thirds of their value in a short time, helping to cause the 2001 recession and a period of high unemployment. A few years later there was a major bubble in housing prices. The collapse of this bubble in 2008 triggered a severe financial crisis followed by a deep recession that was still ongoing as this book went to press.

These events have led to a fierce debate among economists over whether policy makers should try to pop asset bubbles before they get too big. We’ll describe that debate in Chapter 17.

**ECONOMICS > IN ACTION**

**THE GREAT AMERICAN HOUSING BUBBLE**

Between 2000 and 2006, there was a huge increase in the price of houses in America. By the summer of 2006, home prices were well over twice as high as they had been in January 2000 in a number of major U.S. metropolitan areas, including Los Angeles, San Diego, San Francisco, Washington, Miami, Las Vegas, and New York. By 2004, as the increase in home prices accelerated, a number of economists (including the authors of this textbook) argued that this price increase was excessive—that it was a bubble, a rise in asset prices driven by unrealistic expectations about future prices.

It was certainly true that home prices rose much more than the cost of renting a comparable place to live. Panel (a) of Figure 10-9 compares a widely used index
of U.S. housing prices with the U.S. government’s index of the cost of renting, both shown as index numbers with January 2000 = 100. Home prices shot up, even though rental rates grew only gradually.

Yet there were also a number of economists who argued that the rise in housing prices was completely justified. They pointed, in particular, to the fact that interest rates were unusually low in the years of rapid price increases, and they argued that low interest rates combined with other factors, such as growing population, explained the surge in prices. Alan Greenspan, then chairman of the Federal Reserve, conceded in 2005 that there might be some “froth” in the markets but denied that there was any national bubble.

Unfortunately, it turned out that the skeptics were right. Greenspan himself would later concede that there had, in fact, been a huge national bubble. In 2006, as home prices began to level off, it became apparent that many buyers had held unrealistic expectations about future prices. As home prices began to fall, expectations of future increases in home prices were revised downward, precipitating a sudden and dramatic collapse in prices. And with home prices falling, the demand for housing fell drastically, as illustrated by panel (b) of Figure 10-9.

The implosion in housing, in turn, created numerous economic difficulties, including severe stress on the banking system, which we will examine in Chapter 14.

CHECK YOUR UNDERSTANDING 10-3

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 although profits are low this year, it has discovered a new line of business that will generate high profits next year.
   b. The company announces that although it had high profits this year, those profits 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.
6. 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 tangible object that can generate future income. 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 without much loss of value (in contrast to illiquid assets, which are not easily converted).

7. Although many small and moderate-size borrowers use bank loans to fund investment spending, larger companies typically issue bonds. Bonds with a higher risk of default must typically pay a higher interest rate. 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, more sensitive to a loss than an equal-sized gain. Loan-backed securities, a recent innovation, are assets created by pooling individual loans and selling shares of that pool to investors. Because they are more diversified and more liquid than individual loans, bonds are preferred by investors. It can be difficult, however, to assess a bond’s quality.

8. 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 allow small investors to diversify, and life insurance companies reduce risk.

9. 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 funds at any one time. A well-functioning banking sector is a key ingredient of long-run economic growth.

10. Asset market fluctuations can be a source of short-run macroeconomic instability. Asset prices are determined by supply and demand as well as by the desirability of competing assets, like bonds: when the interest rate rises, prices of stocks and physical assets such as real estate generally fall, and vice versa. Expectations drive the supply of and demand...
for assets: expectations of higher future prices push
today’s asset 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 assets
embody all publicly available information. It implies
that fluctuations are inherently unpredictable—they
follow a random walk.

11. 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 fun-
damentals alone. Policy makers assume neither that
markets always behave rationally nor that they can
outsmart them.

KEY TERMS

Savings–investment spending identity, p. 276
Budget surplus, p. 277
Budget deficit, p. 277
Budget balance, p. 277
National savings, p. 277
Net capital inflow, p. 278
Loanable funds market, p. 281
Present value, p. 282
Crowding out, p. 286
Fisher effect, p. 289
Wealth, p. 291
Financial asset, p. 291
Physical asset, p. 291
Liability, p. 291
Transaction costs, p. 292
Financial risk, p. 292
Diversification, p. 293
Liquid, p. 293
Illiquid, p. 293
Loan, p. 293
Default, p. 294

Loan-backed securities, p. 294
Financial intermediary, p. 295
Mutual fund, p. 295
Pension fund, p. 296
Life insurance company, p. 296
Bank deposit, p. 296
Bank, p. 296
Efficient markets hypothesis, p. 300
Random walk, p. 301

PROBLEMS

1. Given the following information about the closed
economy of Britania, 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 econo-
y of Regalia, what is the level of investment spending
and private savings, and what are the budget balance
and net capital inflow? What is the relationship among
the four? There are no government transfers. (Hint:
net capital inflow equals the value of imports (IM) minus
the value of exports (X).)

GDP = $1,000 million
C = $850 million
T = $50 million
G = $100 million
IM = $80 million
X = $100 million

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

<table>
<thead>
<tr>
<th>Country</th>
<th>Investment spending as a percentage of GDP</th>
<th>Private savings as a percentage of GDP</th>
<th>Net capital inflow as a percentage of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capsland</td>
<td>20%</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Marsalia</td>
<td>20%</td>
<td>25</td>
<td>-2</td>
</tr>
</tbody>
</table>

4. Assume the economy is open to capital inflows and out-
flows and therefore net capital inflow equals imports
(IM) minus exports (X). Answer each of the following
questions.

a. X = $125 million
IM = $80 million
Budget balance = -$200 million
I = $350 million
Calculate private savings.

b. X = $85 million
IM = $135 million
Budget balance = $100 million
Private savings = $250 million
Calculate I.

c. X = $60 million
IM = $95 million
Private savings = $325 million
I = $300 million
Calculate the budget balance.

d. Private savings = $325 million
I = $400 million
Budget balance = $10 million
Calculate IM - X.
The accompanying table, taken from the National Income and Product Accounts Tables, shows the various components of U.S. GDP in 2009 and 2010 in billions of dollars.

<table>
<thead>
<tr>
<th>Year</th>
<th>Gross domestic product (billions of dollars)</th>
<th>Private consumption (billions of dollars)</th>
<th>Gross domestic investment (billions of dollars)</th>
<th>Government purchases of goods and services (billions of dollars)</th>
<th>Government savings (budget balance) (billions of dollars)</th>
<th>Net government taxes after transfers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>$13,939.0</td>
<td>$9,866.1</td>
<td>$2,052.2</td>
<td>$2,412.2</td>
<td>-$1,296.0</td>
<td>?</td>
</tr>
<tr>
<td>2010</td>
<td>14,526.5</td>
<td>10,245.5</td>
<td>2,300.4</td>
<td>2,497.5</td>
<td>?</td>
<td>1,198.5</td>
</tr>
</tbody>
</table>

a. Complete the table by filling in the missing figures.
b. For each year, calculate taxes (after transfers) as a percentage of GDP.
c. For each year, calculate national savings and private savings.

6. Use the market for loanable funds shown in the accompanying diagram to explain what happens to private savings, private investment spending, and the interest rate if each of the following events occur. Assume that there are no capital inflows or outflows.

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.

7. 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 that there are no capital inflows or outflows. How will the equilibrium interest rate and the equilibrium quantity of loanable funds change? Is there any crowding out in the market?

8. In 2010, Congress estimated that the cost of increasing the U.S. presence in Afghanistan by 30,000 troops was approximately $36 billion. Since the U.S. government was running a budget deficit at the time, assume that the surge in troop levels was financed by government borrowing, which increases the demand for loanable funds without affecting supply. This question considers the likely effect of this government expenditure on the interest rate.

a. Draw typical demand ($D_1$) and supply ($S_1$) curves for loanable funds without the cost of the surge in troop levels accounted for. Label the vertical axis “Interest rate” and the horizontal axis “Quantity of loanable funds.” Label the equilibrium point ($E_1$) and the equilibrium interest rate ($r_1$).
b. Now draw a new diagram with the cost of the surge in troop levels included in the analysis. Shift the demand curve in the appropriate direction. Label the new equilibrium point ($E_2$) and the new equilibrium interest rate ($r_2$).
c. How does the equilibrium interest rate change in response to government expenditure on the troop surge? Explain.
9. Explain why equilibrium in the loanable funds market maximizes efficiency.

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

11. Boris Borrower and Lynn Lender agree that Lynn will lend Boris $10,000 and that Boris will repay the $10,000 with interest in one year. They agree to a nominal interest rate of 8%, reflecting a real interest rate of 3% on the loan and a commonly shared expected inflation rate of 5% over the next year.
   a. If the inflation rate is actually 4% over the next year, how does that lower-than-expected inflation rate affect Boris and Lynn? Who is better off?
   b. If the actual inflation rate is 7% over the next year, how does that affect Boris and Lynn? Who is better off?

12. Using the accompanying diagram, explain what will happen to the market for loanable funds when there is a fall of 2 percentage points in the expected future inflation rate. How will the change in the expected future inflation rate affect the equilibrium quantity of loanable funds?

![Diagram showing the loanable funds market with the supply and demand curves, and the equilibrium quantity and rate of interest.]

13. The accompanying diagram shows data for the interest rate on 10-year euro area government bonds and inflation for the euro area for 1991 through mid-2011, as reported by the European Central Bank. How would you describe the relationship between the two? How does the pattern compare to that of the United States in Figure 10-8?

![Diagram showing the interest rate on 10-year euro area government bonds and inflation rate for 1991 through mid-2011.]

14. For each of the following, is it an example of investment spending, investing in financial assets, or investing in physical assets?
   a. Rupert 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.

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

16. 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?

17. Explain the effect on a company’s stock price today of each of the following events, other things held constant.
   a. The interest rate on bonds falls.
   b. Several companies in the same sector announce surprisingly higher 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.

18. Sallie Mae is a quasi-governmental agency that packages individual student loans into pools of loans and sells shares of these pools to investors as Sallie Mae bonds.
   a. What is this process called? What effect will it have on investors compared to situations in which they could only buy and sell individual student loans?
   b. What effect do you think Sallie Mae’s actions will have on the ability of students to get loans?
   c. Suppose that a very severe recession hits and, as a consequence, many graduating students cannot get jobs and default on their student loans. What effect will this have on Sallie Mae bonds? Why is it likely that investors now believe Sallie Mae bonds to be riskier than expected? What will be the effect on the availability of student loans?