Monopsony in the Labor Market Not all labor markets in which unions operate are competitive. Rather, some are labor markets in which the employer possesses market power and the union enters to try to counteract that power.

A market in which there is a single buyer is called a **monopsony**. A monopsony labor market has one employer. In some parts of the country, managed health-care organizations are the major employer of health-care professionals. In some communities, Wal-Mart is the main employer of sales clerks. These firms have monopsony power.

A monopsony acts on the buying side of a market in a similar way to a monopoly on the selling side. The firm maximizes profit by hiring the quantity of labor that makes the marginal cost of labor equal to the value of marginal product of labor and by paying the lowest wage rate at which it can attract this quantity of labor.

Figure 18.5 illustrates a monopsony labor market. Like all firms, a monopsony faces a downward-sloping value of marginal product curve, *VMP*, which is its demand for labor curve, *D*—the curve labeled *VMP* = *D* in the figure.

What is special about monopsony is the marginal cost of labor. For a firm in a competitive labor market, the marginal cost of labor is the wage rate. For a monopsony, the marginal cost of labor exceeds the wage rate. The reason is that being the only buyer in the market, the firm faces an upward-sloping supply of labor curve—the curve *S* in the figure.

To attract one more worker, the monopsony must offer a higher wage rate. But it must pay this higher wage rate to all its workers, so the marginal cost of a worker is the wage rate plus the increased wage bill that arises from paying all the workers the higher wage rate.

The supply curve is now the average cost of labor curve and the relationship between the supply curve and the marginal cost of labor curve, *MCL*, is similar to that between a monopoly's demand curve and marginal revenue curve (see p. 302). The relationship between the supply curve and the *MCL* curve is also similar to that between a firm's average cost curve and marginal cost curve (see pp. 258–259).

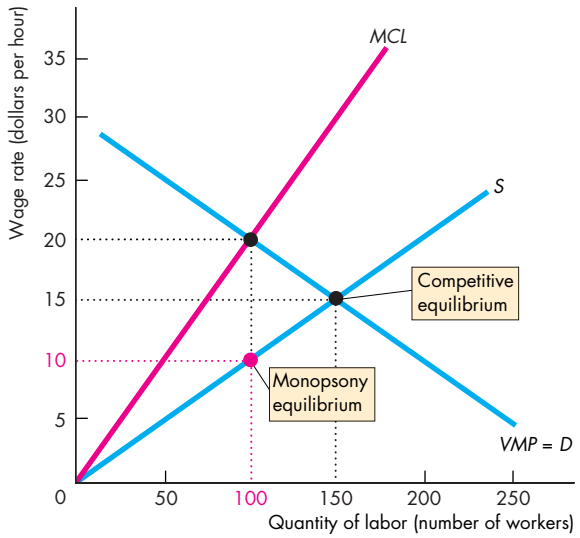
To find the profit-maximizing quantity of labor to hire, the monopsony sets the marginal cost of labor equal to the value of marginal product of labor. In Fig. 18.5, this outcome occurs when the firm employs 100 workers.

To hire 100 workers, the firm must pay $10 an hour (on the supply of labor curve). Each worker is paid $10 an hour, but the value of marginal product of labor is $20 an hour, so the firm makes an economic profit of $10 an hour on the marginal worker.

If the labor market in Fig. 18.5 were competitive, the equilibrium wage rate and employment would be determined by the demand and supply curves. The wage rate would be $15 an hour, and 150 workers would be employed. So compared with a competitive labor market, a monopsony pays a lower wage rate and employs fewer workers.

A Union and a Monopsony A union is like a monopoly. If the union (monopoly seller) faces a monopsony buyer, the situation is called **bilateral monopoly**. An example of bilateral monopoly is the Writers Guild of America that represents film, television, and radio writers, and an employers' alliance that represents

FIGURE 18.5 A Monopsony Labor Market



A monopsony is a market structure in which there is a single buyer. A monopsony in the labor market has a value of marginal product curve *VMP* and faces a labor supply curve *S*. The marginal cost of labor curve is *MCL*. Making the marginal cost of labor equal to the value of marginal product maximizes profit. The monopsony hires 100 hours of labor and pays the lowest wage rate for which that quantity of labor will work, which is $10 an hour.

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CBS, MGM, NBC, and other entertainment companies. Every three years, the Writers Guild and the employers' alliance negotiate a pay deal.

In bilateral monopoly, the outcome is determined by bargaining, which depends on the costs that each party can inflict on the other. The firm can shut down temporarily and lock out its workers, and the workers can shut down the firm by striking. Each party estimates the other's strength and what it will lose if it does not agree to the other's demands.

Usually, an agreement is reached without a strike or a lockout. The threat is usually enough to bring the bargaining parties to an agreement. When a strike or lockout does occur, it is because one party has misjudged the costs each party can inflict on the other. Such an event occurred in November 2007 when the writers and entertainment producers failed to agree on a compensation deal. A 100-day strike followed that ended up costing the entertainment industry an estimated $2 billion.

In the example in Fig. 18.5, if the union and employer are equally strong, and each party knows the strength of the other, they will agree to split the gap between $10 (the wage rate on the supply curve) and $20 (the wage rate on the demand curve) and agree to a wage rate of $15 an hour.

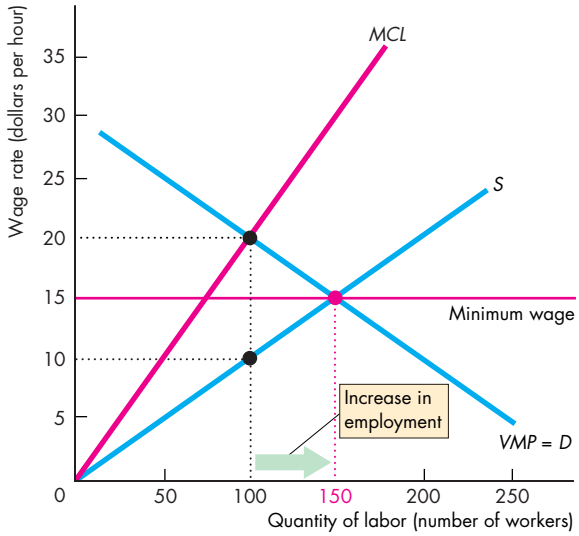
You've now seen that in a monopsony, a union can bargain for a higher wage rate without sacrificing jobs. A similar outcome can arise in a monopsony labor market when a minimum wage law is enforced. Let's look at the effect of a minimum wage.

Monopsony and the Minimum Wage In a competitive labor market, a minimum wage that exceeds the equilibrium wage decreases employment (see Chapter 6, pp. 131–132). In a monopsony labor market, a minimum wage can increase both the wage rate and employment. Let's see how.

Figure 18.6 shows a monopsony labor market without a union. The wage rate is $10 an hour and 100 workers are employed.

A minimum wage law is passed that requires employers to pay at least $15 an hour. The monopsony now faces a perfectly elastic supply of labor at $15 an hour up to 150 workers (along the minimum wage line). To hire more than 150 workers, a wage rate above $15 an hour must be paid (along the supply curve). Because the wage rate is $15 an hour up to 150 workers, so is the marginal cost of labor $15 an hour up to 150 workers. To maximize profit, the monopsony sets the marginal cost of labor equal to the value of marginal product of labor (on the demand curve). That is, the monopsony hires 150 workers and pays $15 an hour. The minimum wage law has succeeded in raising the wage rate and increasing the number of workers employed.

FIGURE 18.6 Minimum Wage Law in Monopsony



In a monopsony labor market, the wage rate is $10 an hour and 100 workers are hired. If a minimum wage law increases the wage rate to $15 an hour, the wage rate rises to this level and employment increases to 150 workers.

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Scale of the Union–Nonunion Wage Gap

You've seen how a union can influence the wage rate, but how much of a difference to wage rates do unions actually make? This question is difficult to answer. To measure the difference in wages attributable to unions, economists have looked at the wages of unionized and nonunionized workers who do similar work and have similar skills.

The evidence based on these comparisons is that the union–nonunion wage gap lies between 10 and 25 percent of the wage. For example, unionized airline pilots earn about 25 percent more than nonunion pilots with the same level of skill. In markets that have only a union wage rate, we might presume that the wage rate is 10 to 25 percent higher than it would be in the absence of a union.

Economics in Action

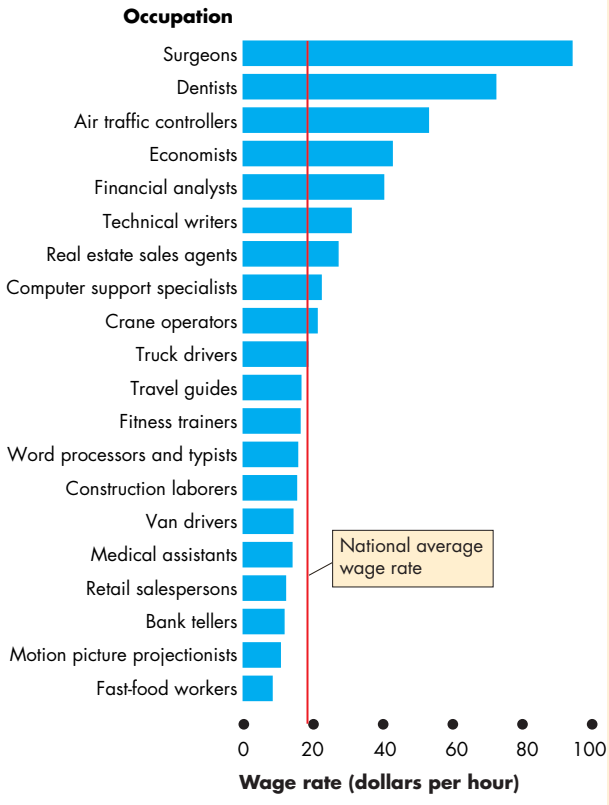
Wage Rates in the United States

In 2007, the average wage rate in the United States was a bit less than $20 an hour. The figure shows the *average hourly wage rates* for twenty jobs selected from the more than 700 jobs for which the Bureau of Labor Statistics reports wage rate data.

You can see that a surgeon, on average, earns more than 11 times as much per hour as a fast-food worker and more than twice as much as an economist. Remember that these numbers are averages. Some surgeons earn much more and some earn much less than the average surgeon.

Many more occupations earn a wage rate below the national average than above it. Most of the occupations that earn more than the national average require a college degree and postgraduate training.

Earning differences are explained by differences in the value of the marginal product of the skills in the various occupations and in market power.



Wage Rates in 20 Jobs

Source of data: Bureau of Labor Statistics.

Trends and Differences in Wage Rates

You can use what you've learned about labor markets to explain the trend in wage rates and differences between wage rates.

Wage rates increase over time—trend upward. The reason is that the value of marginal product of labor trends upward. Technological change and the new types of capital that it brings make workers more productive. With greater labor productivity, the demand for labor increases and so does the average wage rate. Even jobs in which productivity doesn't increase experience an increase in the *value* of marginal product. Child care is an example. A child-care worker can't care for an increasing number of children, but an increasing number of parents who earn high wages are willing to hire child-care workers. The *value* of marginal product of these workers increases.

Wage rates are unequal, and in recent years they have become increasingly unequal. High wage rates have increased rapidly while low wage rates have stagnated or even fallen. The reasons are complex and not fully understood.

One reason is that the new technologies of the 1990s and 2000s made skilled workers more productive and destroyed some low-skilled jobs. An example is the ATM, which took the jobs and lowered the wage rate of bank tellers and created the jobs and increased the wage rates of computer programmers and electronic engineers. Another reason is that globalization has brought increased competition for low-skilled workers and opened global markets for high-skilled workers.

REVIEW QUIZ

1. What determines the amount of labor that households plan to supply?
2. How is the wage rate and employment determined in a competitive labor market?
3. How do labor unions influence wage rates?
4. What is a monopsony and why is a monopsony able to pay a lower wage rate than a firm in a competitive labor market?
5. How is the wage rate determined when a union faces a monopsony?
6. What is the effect of a minimum wage law in a monopsony labor market?

You can work these questions in Study Plan 18.3 and get instant feedback. myeconlab

Capital and Natural Resource Markets

The markets for capital and land can be understood by using the same basic ideas that you've seen when studying a competitive labor market. But markets for nonrenewable natural resources are different. We'll now examine three groups of factor markets:

- Capital rental markets
- Land rental markets
- Nonrenewable natural resource markets

Capital Rental Markets

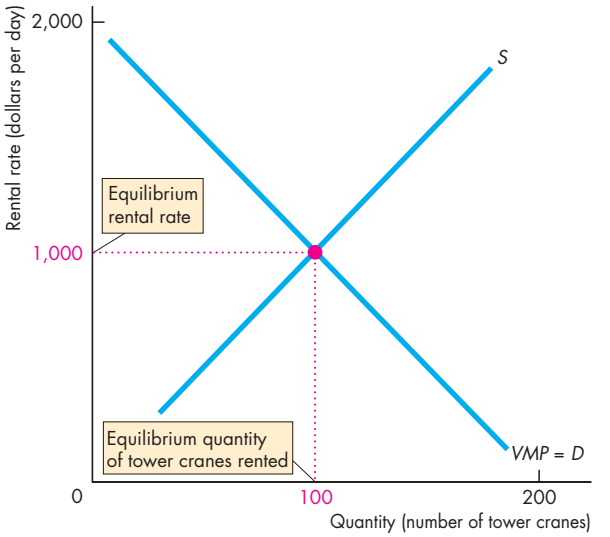
The demand for capital is derived from the *value of marginal product of capital*. Profit-maximizing firms hire the quantity of capital services that makes the value of marginal product of capital equal to the *rental rate of capital*. The *lower* the rental rate of capital, other things remaining the same, the *greater* is the quantity of capital demanded. The supply of capital responds in the opposite way to the rental rate. The *higher* the rental rate, other things remaining the same, the *greater* is the quantity of capital supplied. The equilibrium rental rate makes the quantity of capital demanded equal to the quantity supplied.

Figure 18.7 illustrates the rental market for tower cranes—capital used to construct high-rise buildings. The value of marginal product and the demand curve is *VMP* = *D*. The supply curve is *S*. The equilibrium rental rate is $1,000 per day and 100 tower cranes are rented.

Rent-Versus-Buy Decision Some capital services are obtained in a rental market like the market for tower cranes. And like tower cranes, many of the world's large airlines rent their airplanes. But not all capital services are obtained in a rental market. Instead, firms buy the capital equipment that they use. You saw in Chapter 10 (pp. 228–229) that the cost of the services of the capital that a firm owns and operates itself is an implicit rental rate that arises from depreciation and interest costs. Firms that buy capital *implicitly* rent the capital to themselves.

The decision to obtain capital services in a rental market rather than buy capital and rent it implicitly is made to minimize cost. The firm compares the cost of explicitly renting the capital and the cost of buying and implicitly renting it. This decision is the same as the one that a household makes in deciding whether to rent or buy a home.

FIGURE 18.7 A Rental Market for Capital



The value of marginal product of tower cranes, *VMP*, determines the demand, *D*, for tower crane rentals. With the supply curve, *S*, the equilibrium rental rate is $1,000 a day and 100 cranes are rented.

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To make a rent-versus-buy decision, a firm must compare a cost incurred in the *present* with a stream of rental costs incurred over some *future* period. The Mathematical Note (pp. 434–435) explains how to make this comparison by calculating the *present value* of a future amount of money. If the *present value* of the future rental payments of an item of capital equipment exceeds the cost of buying the capital, the firm will buy the equipment. If the *present value* of the future rental payments of an item of capital equipment is less than the cost of buying the capital, the firm will rent (or lease) the equipment.

Land Rental Markets

The demand for land is based on the same factors as the demand for labor and the demand for capital—the *value of marginal product of land*. Profit-maximizing firms rent the quantity of land at which the value of marginal product of land is equal to the *rental rate of land*. The *lower* the rental rate, other things

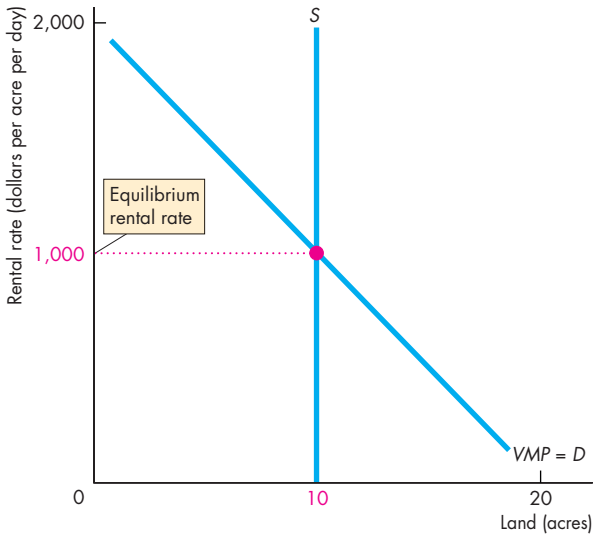
remaining the same, the *greater* is the quantity of land demanded.

But the supply of land is special: Its quantity is fixed, so the quantity supplied cannot be changed by people's decisions. The supply of each particular block of land is perfectly inelastic.

The equilibrium rental rate makes the quantity of land demanded equal to the quantity available. Figure 18.8 illustrates the market for a 10-acre block of land on 42nd Street in New York City. The quantity supplied is fixed and the supply curve is *S*. The value of marginal product and the demand curve is *VMP* = *D*. The equilibrium rental rate is $1,000 an acre per day.

The rental rate of land is high in New York because the willingness to pay for the services produced by that land is high, which in turn makes the *VMP* of land high. A Big Mac costs more at McDonald's on 42nd Street, New York, than at McDonald's on Jefferson Avenue, St. Louis, but not because the rental rate of land is higher in New York. The rental rate of land is higher in New York because of the greater willingness to pay for a Big Mac (and other goods and services) in New York.

FIGURE 18.8 A Rental Market for Land



The value of marginal product of a 10-acre block, *VMP*, determines the rental demand, *D*, for this land. With the supply curve, *S*, the block rents for $10,000 a day.

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Nonrenewable Natural Resource Markets

The nonrenewable natural resources are oil, gas, and coal. Burning one of these fuels converts it to energy and other by-products, and the used resource cannot be re-used. The natural resources that we use to make metals are also nonrenewable, but they can be used again, at some cost, by recycling them.

Oil, gas, and coal are traded in global commodity markets. The price of a given grade of crude oil is the same in New York, London, and Singapore. Traders, linked by telephone and the Internet, operate these markets around the clock every day of the year.

Demand and supply determine the prices and the quantities traded in these commodity markets. We'll look at the influences on demand and supply by considering the global market for crude oil.

The Demand for Oil The two key influences on the demand for oil are

1. The *value of marginal product* of oil
2. The expected future price of oil

The value of marginal product of oil is the *fundamental* influence on demand. It works in exactly the same way for a nonrenewable resource as it does for any other factor of production. The greater the quantity of oil used, the smaller is the value of marginal product of oil. Diminishing value of marginal product makes the demand curve slope downward. The lower the price, the greater is the quantity demanded.

The higher the expected future price of oil, the greater is the present demand for oil. The expected future price is a *speculative* influence on demand. Oil in the ground and oil in storage tanks are inventories that can be held or sold. A trader might plan to buy oil to hold now and to sell it later for a profit. Instead of buying oil to hold and sell later, the trader could buy a bond and earn interest. The interest forgone is the opportunity cost of holding the oil. If the price of oil is expected to rise by a bigger percentage than the interest rate, a trader will hold oil and incur the opportunity cost. In this case, the return from holding oil exceeds the return from holding bonds.

The Supply of Oil The three key influences on the supply of oil are

1. The known oil reserves
2. The scale of current oil production facilities
3. The expected future price of oil

Known oil reserves are the oil that has been discovered and can be extracted with today's technology. This quantity increases over time because advances in technology enable ever-less accessible sources to be discovered. The greater the size of known reserves, the greater is the supply of oil. But this influence on supply is small and indirect. It operates by changing the expected distant future price of oil. Even a major new discovery of oil would have a negligible effect on current supply of oil.

The scale of current oil production facilities is the *fundamental* influence on the supply of oil. Producing oil is like any production activity: It is subject to increasing marginal cost. The increasing marginal cost of extracting oil means that the supply curve of oil slopes upward. The higher the price of oil, the greater is the quantity supplied. When new oil wells are sunk or when new faster pumps are installed, the supply of oil increases. When existing wells run dry, the supply of oil decreases. Over time, the factors that increase supply are more powerful than those that decrease supply, so changes in the fundamental influence increase the supply of oil.

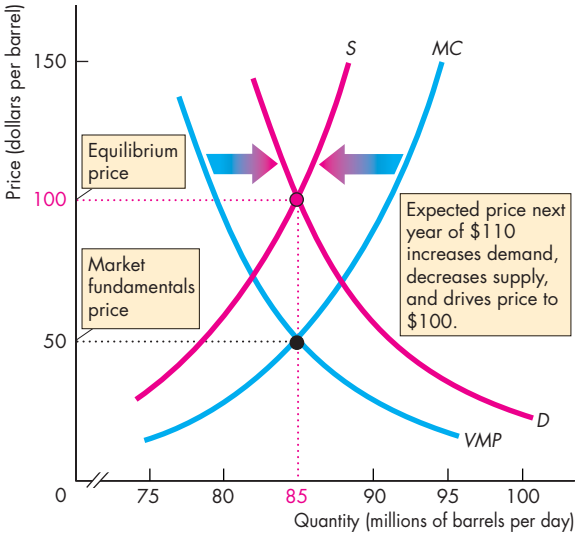
Speculative forces based on expectations about the future price also influence the supply of oil. The *higher* the expected future price of oil, the *smaller* is the present supply of oil. A trader with an oil inventory might plan to sell now or to hold and sell later. You've seen that interest forgone is the opportunity cost of holding the oil. If the price of oil is expected to rise by a bigger percentage than the interest rate, it is profitable to incur the opportunity cost of holding oil rather than selling it immediately.

The Equilibrium Price of Oil The demand for oil and the supply of oil determine the equilibrium price and quantity traded. Figure 18.9 illustrates the market equilibrium.

The value of marginal product of oil, *VMP*, is the *fundamental determinant of demand*, and the marginal cost of extraction, *MC*, is the f*undamental determinant of supply.* Together, they determine the *market fundamentals price*.

If expectations about the future price are also based on fundamentals, the equilibrium price is the market fundamentals price. But if expectations about the future price of oil depart from what the market fundamentals imply, *speculation* can drive a wedge between the equilibrium price and the market fundamentals price.

FIGURE 18.9 A Nonrenewable Natural Resource Market



The value of marginal product of a natural resource, *VMP*, and the marginal cost of extraction, *MC*, determine the *market fundamentals* price. Demand, *D*, and supply, *S*, which determine the equilibrium price, are influenced by the expected future price. Speculation can bring a gap between the market fundamentals price and the equilibrium price.

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The Hotelling Principle Harold Hotelling, an economist at Columbia University, had an incredible idea: Traders expect the price of a nonrenewable natural resource to rise at a rate equal to the interest rate. We call this idea the **Hotelling Principle.** Let's see why it is correct.

You've seen that the interest rate is the opportunity cost of holding an oil inventory. If the price of oil is expected to rise at a rate that exceeds the interest rate, it is profitable to hold a bigger inventory. Demand increases, supply decreases, and the price rises. If the interest rate exceeds the rate at which the price of oil is expected to rise, it is not profitable to hold an oil inventory. Demand decreases, supply increases, and the price falls. But if the price of oil is expected to rise at a rate equal to the interest rate, holding an inventory of oil is just as good as holding bonds. Demand and supply don't change and the price does not change. Only when the price of oil is expected to rise at a rate equal to the interest rate is the price at its equilibrium.

Economics in Action

The World and U.S. Markets for Oil

The world produced about 31 billion barrels of oil in 2008 and the price shot upward from $85 in January to $135 in June. The high price and foreign dependence became major political issues.

Although the United States imports almost three quarters of its oil from other countries, much of it comes from close to home. Figure 1 provides the details: Only 14 percent of the U.S. oil supply comes from the Middle East and more than one third comes from Canada, Mexico, and other Western Hemisphere nations.

Even if the United States produced all its own oil, it would still face a fluctuating global price. U.S. producers would not willingly sell to U.S. buyers for a price below the world price. So energy independence doesn't mean an independent oil price.

The Hotelling Principle tells us that we must expect the price of oil to rise at a rate equal to the interest rate. But expecting the price to rise at a rate equal to the interest rate doesn't mean that the price will rise at this rate. As you can see in Fig. 2, the price of oil over the past 50 or so years has not followed the path predicted by the Hotelling Principle.

The forces that influence expectations are not well understood. The expected future price of oil depends on its expected future rate of use and the rate of discovery of new sources of supply. One person's expectation about a future price also depends on guesses about other people's expectations. These guesses can change abruptly and become self-reinforcing. When the expected future price of oil changes for whatever reason, demand and supply change, and so does the price. Prices in speculative markets are always volatile.

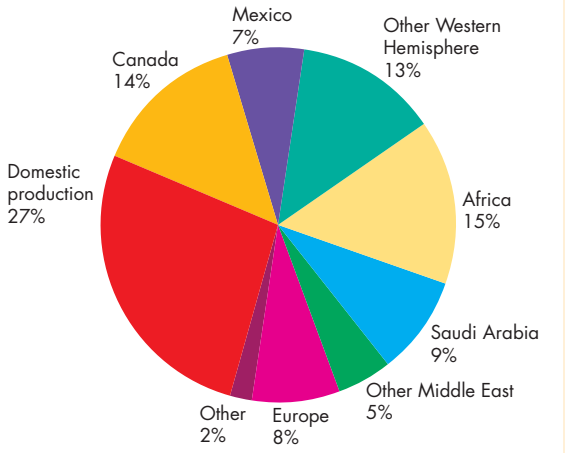

Figure 1 Our Diverse Sources of Oil

Source of data: U.S. Energy Information Administration.

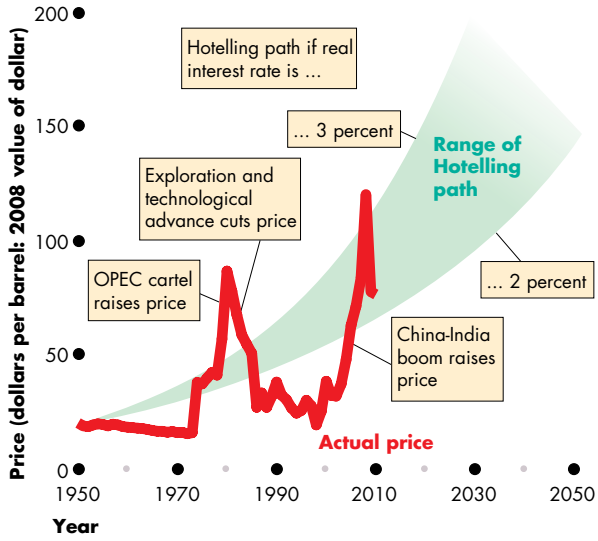

Figure 2 The Price of Oil and Its Hotelling Path

Source of data: U.S. Energy Information Administration.

REVIEW QUIZ

1 What determines demand and supply in rental markets for capital and land?
2 What determines the demand for a nonrenewable natural resource?
3 What determines the supply of a nonrenewable natural resource?
4 What is the market fundamentals price and how might it differ from the equilibrium price?
5 Explain the Hotelling Principle.

You can work these questions in Study Plan 18.4 and get instant feedback. myeconlab

Reading Between the Lines on pp. 432–433 focuses on the U.S. labor market and the tough conditions that workers are likely to face.

The next chapter looks at how the market economy distributes income and explains the trends in the distribution of income. The chapter also looks at the efforts by governments to redistribute income and modify the market outcome.