5

Markets in Action

Over the past two chapters, we have developed the model of demand and supply that you can now use to analyze individual markets. A full understanding of the basic theory, however, comes only with practice. This chapter will provide some practice by analyzing several examples, including minimum wages and rent controls.

Before examining these cases, however, we begin the chapter by discussing how various markets are related to one another. In Chapters 3 and 4, we used the simple demand-and-supply model to describe a single market, ignoring what was going on in other markets. For example, when we examined the market for carrots, we made no mention of the markets for milk, televisions, or labour services. In other words, we viewed the market for carrots in isolation from all other markets. But this was only a simplification. In this chapter's opening section we note that the economy should not be viewed as a series of isolated markets. Rather, the economy is a complex system of inter-related markets. The implication of this complex structure is that events leading to changes in one market typically lead to changes in other markets as well.

5.1 The Interaction Among Markets

Suppose an advance is made that reduces the cost of extracting natural gas. This technological improvement would be represented as a rightward shift in the supply curve for natural gas. The equilibrium price of natural gas would fall and there would be an increase in the equilibrium quantity exchanged.

How would other markets be affected? As natural-gas firms expanded their production, they would increase their demand for the entire range of goods and services used for the extraction, processing, pumping, and distribution of natural gas. This increase in demand would tend to raise the prices of those items and lead the producers of those goods to devote more resources to their production. The natural-gas firms would also increase their demand for labour, since more workers would be required to drill for and extract more natural gas. The increase in demand for labour would tend to push wages up. Firms that hire similar workers in other industries would have to pay higher wages to retain their workers. The profits of those firms would fall and they would employ fewer workers, thus freeing up the extra workers needed in the natural-gas industry.

There would also be a direct effect on consumers. The reduction in the equilibrium price of natural gas would generate some substitution away from other fuels, such as oil and propane, and toward the now-lower-priced natural gas. Such reductions in demand would tend to push down the price of oil and propane, and producers of those fuels would devote fewer resources to their production.

In short, a technological improvement in the natural-gas industry would have effects in many other markets. But there is nothing special about the natural-gas industry. The same would be true about a change in almost any market you can think of.

> **No market or industry exists in isolation from the economy's many other markets.**

A change in one market will lead to changes in many other markets. The induced changes in these other markets will, in turn, lead to changes in the first market. This is what economists call *feedback*. In the example of the natural-gas industry, the reduction in the price of natural gas leads consumers to reduce their demand for oil and propane, thus driving down the prices of these other fuels. But when we draw any given demand and supply curves for natural gas, we assume that the *prices of all other goods are constant*. So, when the prices of oil and propane fall, the feedback effect on the natural-gas market is to shift the demand curve for natural gas to the left (because natural gas is a substitute for both oil and propane).

Predicting the precise size of this feedback effect is difficult, and the analysis of the natural-gas industry—or any other industry—would certainly be much easier if we could ignore it. But we cannot always ignore such feedback effects. Economists make a distinction between cases in which the feedback effects are small enough that they can safely be ignored, and cases in which the feedback effects are large enough that ignoring them would significantly change the analysis.

Partial-equilibrium analysis is the analysis of a single market in situations in which the feedback effects from other markets are ignored. This is the type of analysis that we have used so far in this book, and it is the most common type of analysis in microeconomics. For example, when we examined the market for cigarettes at the end of Chapter 4, we ignored any potential feedback effects that could have come from the market for alcohol, coffee, or many other goods or services. In this case, we used partial-equilibrium analysis, focusing only on the market for cigarettes, because we assumed that

partial-equilibrium analysis The analysis of a single market in isolation, ignoring any feedbacks that may come from induced changes in other markets.

the changes in the cigarette market would produce small enough changes on the other markets that the feedback effects from the other markets would, in turn, be sufficiently diffused that we could safely ignore them. This suggests a general rule telling us when partial-equilibrium analysis is a legitimate method of analysis:

> **If a specific market is quite small relative to the entire economy, changes in the market will have relatively small effects on other markets. The feedback effects on the original market will, in turn, be even smaller. In such cases, partial-equilibrium analysis can successfully be used to analyze the original market.**

general-equilibrium analysis The analysis of all the economy's markets simultaneously, recognizing the interactions among the various markets.

When economists study all markets together, rather than a single market in isolation, they use what is called **general-equilibrium analysis**. This is more complicated than partial-equilibrium analysis because the economist not only must consider what is happening in each individual market but also must take into account how events in each market affect all the other markets.

> **General-equilibrium analysis is the study of how all markets function together, taking into account the various relationships and feedback effects among individual markets.**

myecon**lab** **ADDITIONAL TOPICS**

For a detailed discussion and several examples of the various ways that seemingly unrelated markets may be linked, look for **Linkages Between Markets** in the *Additional Topics* section of this book's MyEconLab.

www.myeconlab.com

As you go on to learn more microeconomics in this and later chapters, you will encounter mostly partial-equilibrium analysis. The book is written this way intentionally—it is easier to learn about the basic ideas of monopoly, competition policy, labour unions, and environmental policy (as well as many other topics) by restricting our attention to single markets. But keep in mind that many other markets are "behind the scenes," linked to the individual markets we choose to study.

We now go on to examine the effects of government-controlled prices. These appear prominently in labour markets and rental housing markets.

5.2 Government-Controlled Prices

In a number of important cases, governments fix the price at which a product must be bought and sold in the domestic market. Here we examine the general consequences of such policies. Later, we look at some specific examples.

In a free market the equilibrium price equates the quantity demanded with the quantity supplied. Government *price controls* are policies that attempt to hold the

price at some disequilibrium value. Some controls hold the market price below its equilibrium value, thus creating a shortage at the controlled price. Other controls hold price above its equilibrium value, thus creating a surplus at the controlled price.

Disequilibrium Prices

When controls hold the price at some disequilibrium value, what determines the quantity *actually traded* on the market? This is not a question we have to ask when examining a free market because the price adjusts to equate quantity demanded with quantity supplied. But this adjustment cannot take place if the government is controlling the price. So, in this case, what determines the quantity actually exchanged?

The key to the answer is the fact that any *voluntary* market transaction requires both a willing buyer and a willing seller. So, if quantity demanded is less than quantity supplied, demand will determine the amount actually exchanged, while the rest of the quantity supplied will remain in the hands of the unsuccessful sellers. Conversely, if quantity demanded exceeds quantity supplied, supply will determine the amount actually exchanged, while the rest of the quantity demanded will represent unsatisfied demand of would-be buyers. Figure 5-1 illustrates the general conclusion:

> At any disequilibrium price, quantity exchanged is determined by the *lesser* of quantity demanded or quantity supplied.

FIGURE 5-1   The Determination of Quantity Exchanged in Disequilibrium
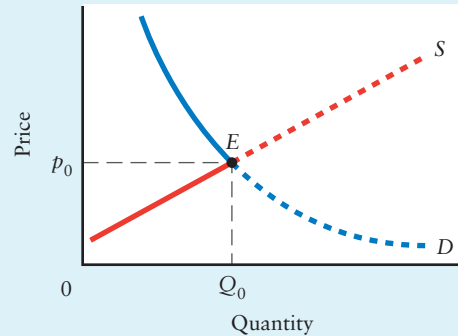
In disequilibrium, quantity exchanged is determined by the lesser of quantity demanded and quantity supplied. At E, the market is in equilibrium, with quantity demanded equal to quantity supplied. For any price below p_0, the quantity exchanged will be determined by the supply curve. For any price above p_0, the quantity exchanged will be determined by the demand curve. Thus, the solid portions of the S and D curves show the actual quantities exchanged at different disequilibrium prices.
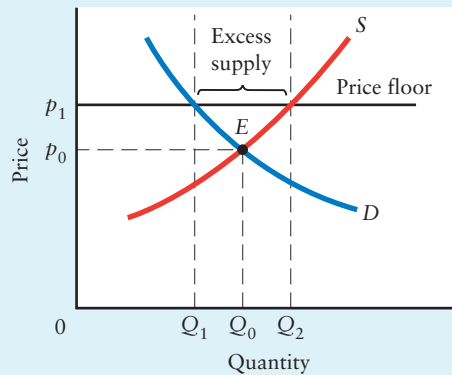
Price Floors

Governments sometimes establish a *price floor,* which is the minimum permissible price that can be charged for a particular good or service. A price floor that is set at or below the equilibrium price has no effect because the free-market equilibrium remains attainable. If, however, the price floor is set above the equilibrium, it will raise the price, in which case it is said to be *binding.*

Price floors may be established by rules that make it illegal to sell the product below the prescribed price, as in the case of a legislated minimum wage. Or the government may establish a price floor by announcing that it will guarantee a certain price by buying any excess supply. Such guarantees are a feature of many agricultural support policies.

The effects of a binding price floor are illustrated in Figure 5-2, which establishes the following key result:

> Binding price floors lead to excess supply. Either an unsold surplus will exist, or someone (usually the government) must enter the market and buy the excess supply.

FIGURE 5-2   A Binding Price Floor

A binding price floor leads to excess supply. The free-market equilibrium is at E, with price p_0 and quantity Q_0. The government now establishes a binding price floor at p_1. The result is excess supply equal to Q_1Q_2.

The consequences of excess supply differ from product to product. If the product is labour, subject to a minimum wage, excess supply translates into people without jobs (unemployment). If the product is wheat, and more is produced than can be sold to consumers, the surplus wheat will accumulate in grain elevators or government warehouses. These consequences may or may not be worthwhile in terms of the other goals achieved. But worthwhile or not, these consequences are inevitable in a competitive market whenever a price floor is set above the market-clearing equilibrium price.

Why might the government want to incur these consequences? One reason is that the people who succeed in selling their products at the price floor are better off than if they had to accept the lower equilibrium price. Workers and farmers are among the politically active, organized groups who have gained much by persuading the government to establish price floors that enable them to sell their goods or services at prices above free-market levels. If the demand is inelastic, as it often is for agricultural products, producers earn more income in total (even though they sell fewer units of the product). The losses are spread across the large and diverse set of purchasers, each of whom suffers only a small loss.

Applying Economic Concepts 5-1 examines the case of a legislated minimum wage in more detail, and explains the basis of the often-heard claim that minimum wages increase unemployment. We discuss the effects of minimum wages in greater detail in Chapter 14 when we examine various labour-market issues.

Price Ceilings

A *price ceiling* is the maximum price at which certain goods and services may be exchanged. Price ceilings on oil, natural gas, and rental housing have been frequently imposed by federal and provincial governments. If the price ceiling is set above the equilibrium price, it has no effect because the free-market equilibrium remains attainable. If, however, the price ceiling is set below the free-market equilibrium price, the price ceiling lowers the price and is said to be *binding*. The effects of binding price ceilings are shown in Figure 5-3, which establishes the following conclusion:

> **Binding price ceilings lead to excess demand, with the quantity exchanged being less than in the free-market equilibrium.**

Allocating a Product in Excess Demand   Free markets eliminate excess demand by allowing prices to rise, thereby allocating the available supply among would-be purchasers. Because this adjustment cannot happen in the presence of a binding price ceiling, some other method of allocation must be adopted. Experience suggests what we can expect.

APPLYING ECONOMIC CONCEPTS 5-1

Minimum Wages and Unemployment

All Canadian governments, provincial, territorial, and federal, have legislated minimum wages. For those industries covered by provincial or territorial legislation (which includes most industries except banking, airlines, trucking, and railways), the minimum wage in 2010 ranged from a low of $8.00 per hour in British Columbia to a high of $10.00 per hour in Nunavut. This box examines the effects of implementing a minimum wage in a competitive labour market and provides a basis for understanding the often-heard claim that minimum wages lead to an increase in unemployment.

The accompanying figure shows the demand and supply curves for labour services in a fully competitive market with "Employment" on the horizontal axis and "Hourly Wage Rate" on the vertical axis. In the absence of any legislated minimum wage, the equilibrium in the labour market would be a wage equal to w_0 and a level of employment equal to E_0.
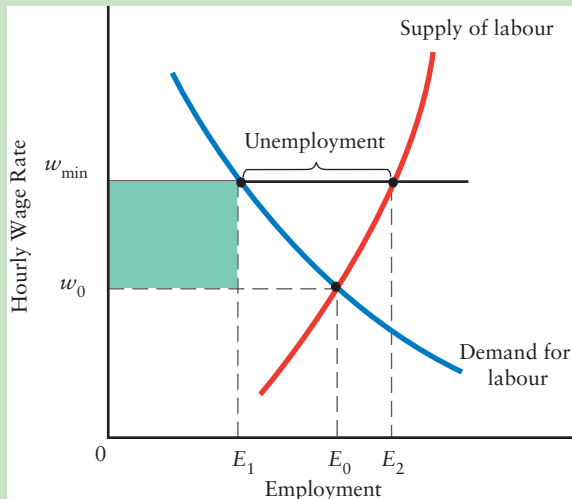

Now suppose the government introduces a minimum wage equal to w_{min} that is greater than w_0. The increased wage has two effects. First, by increasing the cost of labour services to firms, the minimum wage reduces the level of employment to E_1. The second effect is to increase the quantity supplied of labour services to E_2. Thus, the clear effect of the binding minimum wage, as seen in the figure, is to generate unemployment—workers that want a job in this market but are unable to get one—equal to the amount E_1E_2.

Whom does this policy benefit? And whom does it harm? Firms are clearly made worse off since they are now required to pay a higher wage than before the minimum wage was imposed. They respond to this increase in costs by reducing their use of labour. Some (but not all) workers are made better off. The workers who are lucky enough to keep their jobs—E_1 workers in the figure—get a higher wage than before. The shaded area shows the redistribution of income away from firms and toward these fortunate workers. Some workers are harmed by the policy—the ones who lose their jobs as a result of the wage increase, shown in the figure as the quantity E_1E_0.

We have discussed here the effects of minimum wages in a competitive labour market—one in which there are many firms and many workers, none of whom have the power to influence the market wage. In Chapter 14 we will examine non-competitive labour markets, and we will then see that minimum wages may have a different effect on the market. This different behaviour of competitive and non-competitive markets in the presence of minimum wages probably accounts for the disagreements among economists and policymakers regarding the effects of minimum-wage legislation. Until we proceed to that more advanced discussion, however, the analysis of a competitive labour market in this box provides an excellent example of the economic effects of a binding price floor in specific circumstances.

If stores sell their available supplies on a *first-come, first-served* basis, people will rush to stores that are said to have stocks of the product. Buyers may wait hours to get into the store, only to find that supplies are exhausted before they can be served. This is why standing in lines became a way of life in the centrally planned economies of the Soviet Union and Eastern Europe in which price controls were pervasive.

FIGURE 5-3   A Price Ceiling and Black-Market Pricing
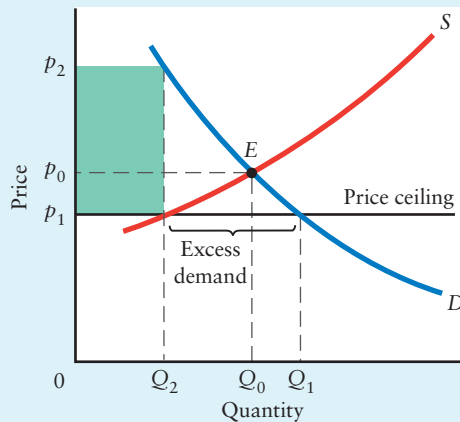
A binding price ceiling causes excess demand and invites a black market. The equilibrium point, E, is at a price of p_0 and a quantity of Q_0. If a price ceiling is set at p_1, the quantity demanded will rise to Q_1 and the quantity supplied will fall to Q_2. Quantity actually exchanged will be Q_2. But if all the available supply of Q_2 were sold on a black market, the price to consumers would rise to p_2. Because black marketeers buy at the ceiling price of p_1 and sell at the black-market price of p_2, their profits are represented by the shaded area.

sellers' preferences
Allocation of commodities in excess demand by decisions of the sellers.

black market A situation in which goods are sold illegally at prices that violate a legal price control.

In market economies, "first-come, first-served" is often the basis for allocating tickets to concerts and sporting events when promoters set a price at which demand exceeds the supply of available seats. In these cases, an illegal market often develops, in which ticket "scalpers" resell tickets at market-clearing prices. Storekeepers (and some ticket sellers) often respond to excess demand by keeping goods "under the counter" and selling only to customers of their own choosing. When sellers decide to whom they will and will not sell their scarce supplies, allocation is said to be by **sellers' preferences**.

If the government dislikes the allocation of products by long line-ups or by sellers' preferences, it can choose to *ration* the product. To do so, it prints only enough ration coupons to match the quantity supplied at the price ceiling and then distributes the coupons to would-be purchasers, who then need both money and coupons to buy the product. The coupons may be distributed equally among the population or on the basis of some criterion, such as age, family status, or occupation. Rationing of this sort was used by Canada and many other countries during both the First and Second World Wars.

Black Markets Price ceilings usually give rise to black markets. A **black market** is any market in which goods are sold illegally at prices that violate a legal price control.

> **Binding price ceilings always create the potential for a black market because a profit can be made by buying at the controlled price and selling at the black-market price.**

Figure 5-3 illustrates the extreme case in which all the available supply is sold on a black market. We say this case is extreme because there are law-abiding people in every society and because governments ordinarily have at least *some* power to enforce their price ceilings. Although some units of a product subject to a binding price ceiling will be sold on the black market, it is unlikely that all of that product will be.

Does the existence of a black market mean that the goals sought by imposing price ceilings have been thwarted? The answer depends on what the goals are. Three of the goals that governments often have when imposing a price ceiling are as follows:

1. To restrict production (perhaps to release resources for other uses, such as wartime military production)

2. To keep specific prices down

3. To satisfy notions of equity in the consumption of a product that is temporarily in short supply

When price ceilings are accompanied by a significant black market, it is not clear that any of these objectives are achieved. First, if producers are willing to sell (illegally) at prices above the price ceiling, nothing restricts them to the level of output of Q_2 in Figure 5-3. As long as they can receive more than a price of p_1, they have an incentive to increase their production. Second, black markets clearly frustrate the second objective since the *actual* prices are not kept down; if quantity supplied remains below Q_0, then the black-market price will be *higher* than the free-market equilibrium price, p_0. The third objective may also be thwarted since with an active black market it is likely that much of the product will be sold only to those who can afford the black-market price, which will often be well above the free-market equilibrium price.

> **To the extent that binding price ceilings give rise to a black market, it is likely that the government's objectives motivating the imposition of the price ceiling will be thwarted.**

The market for health care in Canada is an important example in which market-clearing prices are not charged; instead, the price is controlled at zero and the services are rationed by customers having to wait their turn to be served. No black market has arisen, although when some Canadians travel to the United States and pay cash for health-care services that they cannot get quickly enough in Canada, or when they pay cash for the limited services provided by Canadian private clinics, the effects are similar to those that occur in a black market. Even though there is not enough of the product available in the public system to satisfy all demand at the controlled price of zero, many people's sense of social justice is satisfied because health care, at least in principle, is freely and equally available to everyone. In recent years, there has been a great deal of debate regarding potential reforms to Canada's health-care system; we discuss this debate in more detail in Chapter 18.

5.3 Rent Controls: A Case Study of Price Ceilings

For long periods over the past hundred years, rent controls existed in London, Paris, New York, and many other large cities. In Sweden and Britain, where rent controls on apartments existed for decades, shortages of rental accommodations were chronic. When rent controls were initiated in Toronto and Rome, severe housing shortages developed, especially in those areas where demand was rising.

Rent controls provide a vivid illustration of the short- and long-term effects of this type of market intervention. Note, however, that the specifics of rent-control laws vary greatly and have changed significantly since they were first imposed many decades ago. In particular, current laws often permit exemptions for new buildings and allowances for maintenance costs and inflation. Moreover, in many countries rent controls have evolved into a "second generation" of legislation that focuses on *regulating* the rental housing market rather than simply *controlling the price* of rental accommodation.

In this section, we confine ourselves to an analysis of rent controls that are aimed primarily at holding the price of rental housing below the free-market equilibrium value. It is this "first generation" of rent controls that produced dramatic results in such cities as London, Paris, New York, and Toronto.

The Predicted Effects of Rent Controls

Binding rent controls are a specific case of price ceilings, and therefore Figure 5-3 can be used to predict some of their effects:

1. There will be a housing shortage in the sense that quantity demanded will exceed quantity supplied. Since rents are held below their free-market levels, the available quantity of rental housing will be less than if free-market rents had been charged.

2. The shortage will lead to alternative allocation schemes. Landlords may allocate by sellers' preferences, or the government may intervene, often through security-of-tenure laws, which protect tenants from eviction and thereby give them priority over prospective new tenants.

3. Black markets will appear. For example, landlords may (illegally) require tenants to pay "key money" equal to the difference in value between the free-market and the controlled rents. In the absence of security-of-tenure laws, landlords may force tenants out when their leases expire in order to extract a large entrance fee from new tenants.

FIGURE 5-4   The Short-Run and Long-Run Effects of Rent Controls
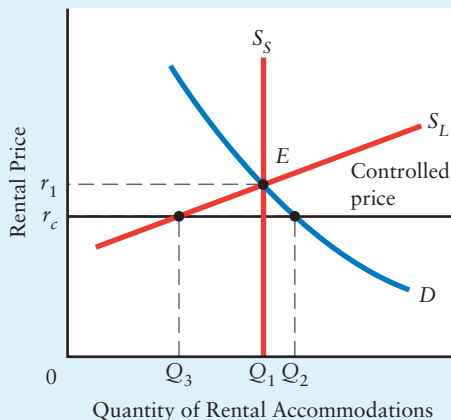
Rent control causes housing shortages that worsen as time passes. The free-market equilibrium is at point E. The controlled rent of r_c forces rents below their free-market equilibrium value of r_1. The short-run supply of housing is shown by the perfectly inelastic curve S_S. Thus, quantity supplied remains at Q_1 in the short run, and the housing shortage is Q_1Q_2. Over time, the quantity supplied shrinks, as shown by the long-run supply curve S_L. In the long run, there are only Q_3 units of rental accommodations supplied, fewer than when controls were instituted. The long-run housing shortage of Q_3Q_2 is larger than the initial shortage of Q_1Q_2.

The unique feature of rent controls, however, as compared with price controls in general, is that they are applied to a highly *durable good* that provides services to consumers for long periods. Once built, an apartment can be used for decades. As a result, the immediate effects of rent control are typically quite different from the long-term effects.

The short-run supply response to the imposition of rent controls is usually quite limited. Some conversions of apartment units to condominiums (that are not covered by the rent-control legislation) may occur, but the quantity of apartments does not change much. The short-run supply curve for rental housing is quite *inelastic*.

In the long run, however, the supply response to rent controls can be quite dramatic. If the expected rate of return from building new rental housing falls significantly below what can be earned on other investments, funds will go elsewhere. New construction will be halted, and old buildings will be converted to other uses or will simply be left to deteriorate. The long-run supply curve of rental accommodations is highly *elastic*.

Figure 5-4 illustrates the housing shortage that worsens as time passes under rent control. Because the short-run supply of housing is inelastic, the controlled rent causes only a moderate housing shortage in the short run. Indeed, most of the shortage comes from an increase in the quantity demanded rather than from a reduction in quantity supplied. As time passes, however, fewer new apartments are built, more conversions take place, and older buildings are not replaced (and not

repaired) as they wear out. As a result, the quantity supplied shrinks steadily and the extent of the housing shortage worsens.

Along with the growing housing shortage comes an increasingly inefficient use of rental accommodation space. Existing tenants will have an incentive to stay where they are even though their family size, location of employment, or economic circumstances may change. Since they cannot move without giving up their low-rent accommodation, some may accept lower-paying jobs nearby simply to avoid the necessity of moving. Thus, a situation will arise in which existing tenants will hang on to accommodation even if it is poorly suited to their needs, while individuals and families who are newly entering the housing market will be unable to find any rental accommodation except at black-market prices.

The province of Ontario instituted rent controls in 1975 and tightened them on at least two subsequent occasions. The controls permitted significant increases in rents only where these were needed to pass on cost increases. As a result, the restrictive effects of rent controls were felt mainly in areas where demand was increasing rapidly (as opposed to areas where only costs were increasing rapidly).

During the mid- and late-1990s, the population of Ontario grew substantially but the stock of rental housing did not keep pace. A shortage developed in the rental-housing market, and was especially acute in Metro Toronto. This growing housing shortage led the Conservative Ontario government in 1997 to loosen rent controls, in particular by allowing landlords to increase the rent as much as they saw fit *but only as tenants vacated the apartment.* Not surprisingly, this policy had both critics and supporters. Supporters argued that a loosening of controls would encourage the construction of apartments and thus help to reduce the housing shortage. Critics argued that landlords would harass existing tenants, forcing them to move out so that rents could be increased for incoming tenants. (Indeed, this behaviour happened in rent-controlled New York City, where a landlord pleaded guilty in January 1999 to hiring a "hit man" to kill some tenants and set fires to the apartments of others to scare them out so that rents could be increased!)

Rent control still exists in Ontario, and the government now places a limit on the annual rate of increase of rents. As of 2009, the maximum allowable increase was 1.8 percent, although landlords could apply to the regulatory body for permission to have a larger increase.

Who Gains and Who Loses?

Existing tenants in rent-controlled accommodations are the principal gainers from a policy of rent control. As the gap between the controlled and the free-market rents grows, and as the stock of available housing falls, those who are still lucky enough to live in rent-controlled housing gain more and more.

Perhaps the most striking effect of rent control is the long-term decline in the amount and quality of rental housing.

Landlords suffer because they do not get the rate of return they expected on their investments. Some landlords are large companies, and others are wealthy individuals. Neither of these groups attracts great public sympathy, even though the rental companies' shareholders are not all rich. But some landlords are people of modest means who may have put their retirement savings into a small apartment block or a house or two. They find that the value of their savings is diminished, and sometimes they find themselves in the ironic position of subsidizing tenants who are far better off than they are.

The other important group of people who suffer from rent controls are *potential future* tenants. The housing shortage will hurt some of them because the rental housing they will require will not exist in the future. These people, who wind up living farther from their places of employment and study or in apartments otherwise inappropriate to their situations, are invisible in debates over rent control because they cannot obtain housing in the rent-controlled jurisdiction. Thus, rent control is often stable politically even when it causes a long-run housing shortage. The current tenants benefit, and they outnumber the current landlords, while the potential tenants, who are harmed, are nowhere to be seen or heard.

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myeconlab   ADDITIONAL TOPICS

In some situations, legislated rent controls may impose relatively small costs. For a fuller explanation, look for **When Rent Controls Work and When They Don't** in the *Additional Topics* section of this book's MyEconLab.

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Policy Alternatives

Most rent controls today are meant to protect lower-income tenants, not only against "profiteering" by landlords in the face of severe local shortages but also against the steadily rising cost of housing. The market solution is to let rents rise sufficiently to cover the rising costs. If people decide that they cannot afford the market price of apartments and will not rent them, construction will cease. Given what we know about consumer behaviour, however, it is more likely that people will make agonizing choices, both to economize on housing and to spend a higher proportion of total income on it, which mean consuming less housing and less of other things as well.

If governments do not want to accept this market solution, there are many things they can do, but they cannot avoid the fundamental fact that the opportunity cost of good housing is high. Binding rent controls create housing shortages. The shortages can be removed only if the government, at taxpayer expense, either subsidizes housing production or produces public housing directly.

Alternatively, the government can make housing more affordable to lower-income households by providing income assistance to these households, allowing them access to higher-quality housing than they could otherwise afford. Whatever policy is adopted, it is important to recognize that providing greater access to rental accommodations has a resource cost. The costs of providing additional housing cannot be voted out of existence; all that can be done is to transfer the costs from one set of persons to another.

5.4 An Introduction to Market Efficiency

In this chapter we have seen the effects of governments intervening in competitive markets by setting price floors and price ceilings. In both cases, we noted that the imposition of a controlled price generates benefits for some individuals and costs for others. For example, in the case of the legislated minimum wage (a price floor), firms are made worse off by the minimum wage, but workers who retain their jobs are made better off. Other workers, those unable to retain their jobs at the higher wage, may be made worse off. In the example of legislated rent controls (a price ceiling), landlords are made worse off by the rent controls, but some tenants are made better off. Those tenants who are no longer able to find an apartment when rents fall are made worse off.

Is it possible to determine the *overall* effects of such policies, rather than just the effects on specific groups? For example, can we say that a policy of legislated minimum wages, while harming firms, nonetheless makes *society as a whole* better off because it helps workers more than it harms firms? Or can we conclude that the imposition of rent controls makes society as a whole better off because it helps tenants more than it harms landlords?

To address such questions, economists use the concept of *market efficiency.* We will explore this concept in more detail in later chapters, but for now we simply introduce the idea and see how it helps us understand the overall effects of price controls. We begin by taking a slightly different look at market demand and supply curves.

Demand as "Value" and Supply as "Cost"

In Chapter 3 we saw that the market demand curve for any product shows, for each possible price, how much of that product consumers want to purchase. Similarly, we saw that the market supply curve shows how much producers want to sell at each possible price. But we can turn things around and view these curves in a slightly different way—by starting with any given quantity and asking about the price. Specifically, we can consider the highest price that consumers are *willing to pay* and the lowest price that producers are *willing to accept* for any given unit of the product. As we will see, viewing demand and supply curves in this manner helps us think about how society as a whole benefits by producing and consuming any given amount of some product.

Let's begin by considering the market demand curve for pizza, as shown in part (i) of Figure 5-5. Each point on the demand curve shows the highest price consumers are willing to pay for a given pizza. (We assume for simplicity that all pizzas are identical.) At point *A* we see that consumers are willing to pay up to $20 for the 100th pizza, and at point *B* consumers are willing to pay up to $15 for the 200th pizza. In both cases, these maximum prices reflect the *value* consumers place on that particular pizza. If consumers valued the 100th pizza by more than $20, they would be willing to pay more to get that pizza, and the price as shown on the demand curve would be higher than $20. If they valued the 100th pizza less than $20, they would not be willing to pay as much as $20, and the price as shown on the demand curve would then be less than $20. Thus, for each pizza, the price on the demand curve shows the value to consumers from consuming that pizza.

FIGURE 5-5   Reinterpreting the Demand and Supply Curves in the Pizza Market

(i) Demand   (ii) Supply
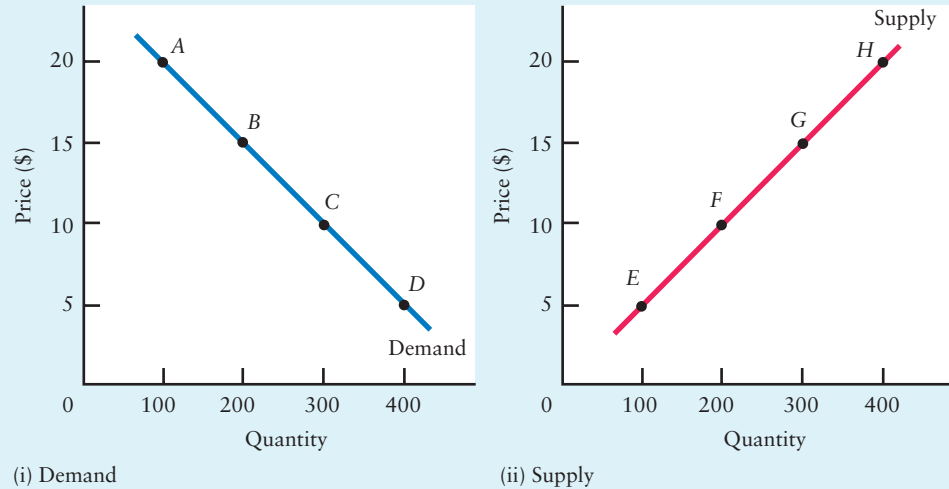
For each pizza, the price on the demand curve shows the value consumers receive from consuming that pizza; the price on the supply curve shows the additional cost to firms of producing that pizza. Each point on the demand curve shows the maximum price consumers are willing to pay to consume that unit. This maximum price reflects the value that consumers get from that unit of the product. Each point on the supply curve shows the minimum price firms are willing to accept for producing and selling that unit. This minimum price reflects the additional costs incurred by producing that unit.

The reason the demand curve is downward sloping is that not all consumers are the same. Some consumers value pizza so highly that they are willing to pay $20 for a pizza; others are prepared to pay only $10, while some value pizza so little that they are prepared to pay only $5. There is nothing special about pizza, however. What is true for the demand for pizza is true for the demand for any other product:

> **For each unit of a product, the price on the market demand curve shows the value to consumers from consuming that unit.**

Now let's consider the market supply curve for pizza, shown in part (ii) of Figure 5-5. Each point on the market supply curve shows the lowest price firms are willing to accept to produce and sell a given pizza. (We maintain our simplifying assumption that all pizzas are identical.) At point *E* firms are willing to accept a price no lower than $5 for the 100th pizza, and at point *F* firms are willing to accept a price no lower than $10 for the 200th pizza. The lowest acceptable price as shown on the supply curve reflects the *additional cost* firms incur to produce each given pizza. To see this, consider the production of the 200th pizza at point *F*. If the firm's total costs increase by $10 when this pizza is produced, the firm will be able to increase its profits as long as it can sell that pizza at a price greater than $10. If it sells the pizza at any price below $10, its profits will decline. If it sells the pizza at a price of exactly $10, its profits will neither rise nor fall. Thus, for a profit-maximizing firm, the *lowest acceptable price* for the 200th pizza is $10.

The reason that the supply curve is upward sloping is that not all producers are the same. Some are so good at producing pizzas (low-cost producers) that they would be willing to accept $5 per pizza; others are less easily able to produce pizzas (high-cost producers) and hence would need to receive $15 in order to produce and sell the identical pizza. Again, what is true for the supply of pizza is true for the supply of other products:

> **For each unit of a product, the price on the market supply curve shows the lowest acceptable price to firms for selling that unit. This lowest acceptable price reflects the additional cost to firms from producing that unit.**

Economic Surplus and Market Efficiency

Once the demand and supply curves are put together, the equilibrium price and quantity can be determined. This brings us to the important concept of *economic surplus*. We continue with our pizza example in Figure 5-6, which shows the demand and supply curves together. Consider a quantity of 100 pizzas. For each one of those 100 pizzas, the value to consumers is given by the height of the demand curve. The additional cost to firms from producing each of these 100 pizzas is shown by the height of the supply curve. For the entire 100 pizzas, the difference between the value to consumers and the additional costs to firms is called economic surplus and is shown by the shaded area ① in the figure.

> **For any given quantity of a product, the area below the demand curve and above the supply curve shows the economic surplus associated with the production and consumption of that product.**

What does this "economic surplus" represent? The economic surplus is the net value that *society as a whole* receives by producing and consuming these 100 pizzas. It arises because firms and consumers have taken resources that have a lower value (as shown by the height of the supply curve) and transformed them into something valued more highly (as shown by the height of the demand curve). To put it differently, the value from consuming the 100 pizzas is greater than the cost of the resources necessary to produce those 100 pizzas—flour, yeast, tomato sauce, cheese, and labour. Thus, the act of producing and consuming those 100 pizzas "adds value" and thus generates benefits for society as a whole.

We are now ready to introduce the concept of market efficiency. In later chapters, after we have explored consumer and firm behaviour in greater detail, we will have a more detailed discussion of efficiency. For now, we simply introduce the concept and see how it relates to the imposition of government price controls.

A market for a specific product is efficient if the quantity of the product produced and consumed is such that the economic surplus is maximized. Note that this refers to the *total* surplus but not its distribution between consumers and producers. For example, the removal of a binding set of rent controls will increase total surplus and thus improve the efficiency of the market. At the same time, however, some tenants will be made worse off while some landlords will be made better off. The fact that total surplus has increased means that, at least in principle, it would be possible for those who gain to compensate those who lose so that everyone ends up being better off. When economists say that "society gains" when market efficiency is enhanced, even though these compensations rarely occur, there is an implicit value judgement being made that the benefits to those who gain outweigh the costs to those who lose.

FIGURE 5-6 Economic Surplus in the Pizza Market
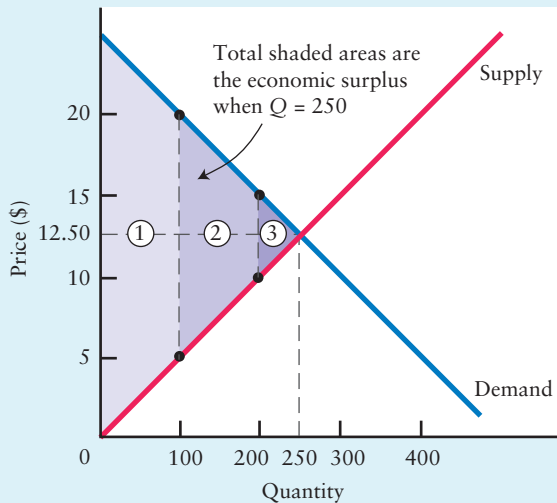
For any quantity of pizzas, the area below the demand curve and above the supply curve shows the economic surplus generated by the production and consumption of those pizzas. The demand curve shows the value consumers place on each additional pizza; the supply curve shows the additional cost associated with producing each pizza. For example, consumers value the 100th pizza at $20, whereas the additional cost to firms of producing that 100th pizza is $5. The economic surplus generated by producing and consuming this 100th pizza is therefore $15 ($20 − $5). For any range of quantity, the shaded area between the curves over that range shows the economic surplus generated by producing and consuming those pizzas.

Economic surplus in the pizza market is maximized—and thus market efficiency is achieved—at the free-market equilibrium quantity of 250 pizzas and price of $12.50. At this point, total economic surplus is the sum of the three shaded areas.

Let's continue with the pizza example in Figure 5-6 and ask, What level of pizza production and consumption is efficient? Consider the quantity of 100 pizzas. At this quantity, the shaded area ① shows the total economic surplus that society receives from producing and consuming 100 pizzas. But if output were to increase beyond 100 pizzas, more economic surplus would be generated because the value placed by consumers on additional pizzas is greater than the additional costs associated with their production. Specifically, if production and consumption were to increase to 200 pizzas, additional economic surplus would be generated, as shown by shaded area ②. Continuing this logic, we see that the amount of economic surplus is *maximized* when the quantity is 250 units, and at that quantity the total economic surplus is equal to the sum of areas ①, ②, and ③.

What would happen if the quantity of pizzas were to rise further, say to 300 units? For any pizzas beyond 250, the value placed on these pizzas by consumers is *less than* the additional costs associated with their production. In this case, producing the last 50 pizzas would actually *decrease* the amount of economic surplus in this market because society would be taking highly valued resources (flour, cheese, etc.) and transforming them into pizzas, which are valued less.

In our example of the pizza market, as long as the price is free to adjust to excess demands or supplies, the equilibrium price and quantity will be determined where the demand and supply curves for pizza intersect. In Figure 5-6, the equilibrium quantity is 250 pizzas, the quantity that maximizes the amount of economic surplus in the pizza market. In other words, the free interaction of demand and supply will result in market efficiency. This result in the pizza market suggests a more general rule:

> **A competitive market will maximize economic surplus and therefore be efficient when price is free to achieve its market-clearing equilibrium level.**[1]

Market Efficiency and Price Controls

At the beginning of this section we asked whether we could determine if *society as a whole* is made better off or worse off as a result of the government's imposition of price floors or price ceilings. With an understanding of economic surplus and market efficiency, we are now ready to consider these questions.

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[1] In Part 6 of this book, we will see some important exceptions to this rule when we discuss "market failures."

FIGURE 5-7   Market Inefficiency with Price Controls

(i) Binding price floor
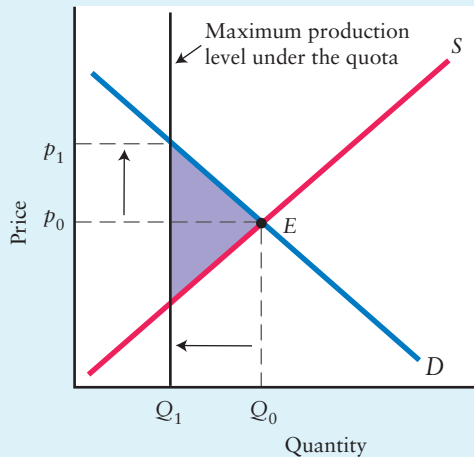
(ii) Binding price ceiling
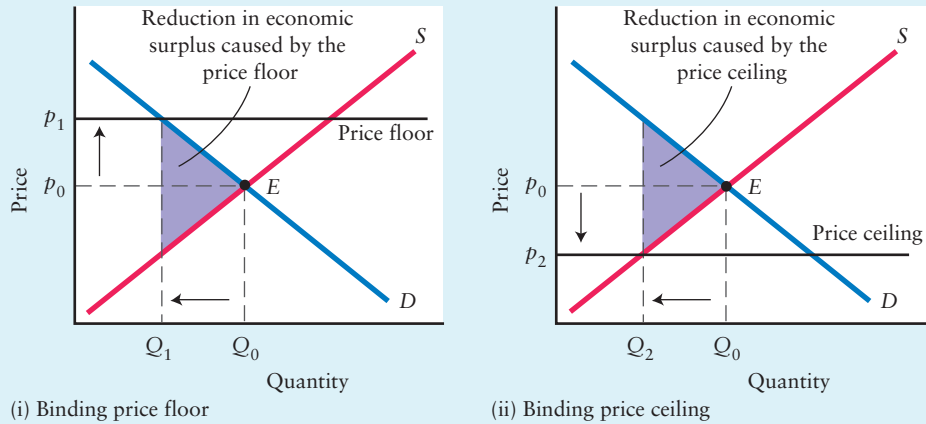
Binding price floors and price ceilings in competitive markets lead to a reduction in over-all economic surplus and thus to market inefficiency. In both parts of the figure, the free-market equilibrium is at point E with price p_0 and quantity Q_0. In part (i), the introduction of a price floor at p_1 reduces quantity to Q_1. In part (ii), the introduction of a price ceiling at p_2 reduces quantity to Q_2. In both parts, the purple shaded area shows the reduction in overall economic surplus—the deadweight loss—created by the price floor (or ceiling). Both outcomes display market inefficiency.

Let's begin with the case of a price floor, as shown in part (i) of Figure 5-7. The free-market equilibrium is shown by point E, with price p_0 and quantity Q_0. When the government imposes a price floor at p_1, the quantity exchanged falls to Q_1. In the free-market case, each of the units of output between Q_0 and Q_1 generate some economic surplus. But when the price floor is put in place, these units of the good are no longer produced or consumed, and thus they no longer generate any economic surplus. The purple shaded area is called the *deadweight loss* caused by the binding price floor, and it represents the overall loss of economic surplus to society. The size of the deadweight loss reflects the extent of market *inefficiency*.

> **The imposition of a binding price floor in an otherwise free and competitive market leads to market inefficiency.**

Now let's consider the case of a price ceiling, as shown in part (ii) of Figure 5-7. The free-market equilibrium is again shown by point E, with price p_0 and quantity Q_0. When the government imposes a price ceiling at p_2, the quantity exchanged falls to Q_2. In the free-market case, each unit of output between Q_0 and Q_2 generates some economic surplus. But when the price ceiling is imposed, these units of the good are no longer produced or consumed, and so they no longer generate any economic surplus. The purple shaded area is the *deadweight loss* and represents the overall loss of surplus to society caused by the policy. The size of the deadweight loss reflects the extent of market *inefficiency*.

> **The imposition of a binding price ceiling in an otherwise free and competitive market leads to market inefficiency.**

Binding price floors and price ceilings do more than merely redistribute economic surplus between buyers and sellers. They also lead to a reduction in the quantity of the product transacted and a reduction in total economic surplus. Society as a whole receives less economic surplus as compared with the free-market case.

One Final Application: Output Quotas

FIGURE 5-8   The Inefficiency of Output Quotas

Binding output quotas lead to a reduction in output and a reduction in overall economic surplus. The free-market equilibrium is at point E with price p_0 and quantity Q_0. Suppose the government then restricts total quantity to Q_1 by issuing output quotas to firms. The market price rises to p_1. The purple shaded area shows the reduction in overall economic surplus—the deadweight loss—created by the quota system.

Before ending this chapter, it is useful to consider one final application of government intervention in a competitive market, and to examine the effects on overall economic surplus and market efficiency. Figure 5-8 illustrates the effects of introducing a system of *output quotas* in a competitive market. Output quotas are commonly used in Canadian agriculture, especially in the markets for milk, butter, and cheese. Output quotas are sometimes used in other industries as well; for example, they are often used in large cities to regulate the number of taxi drivers.

The equilibrium in the free-market case is at point E, with price p_0 and quantity Q_0. When the government introduces an output quota, it restricts total output of this product to Q_1 units and then distributes quotas—"licences to produce"—among the producers. With output restricted to Q_1 units, the market price rises to p_1, the price that consumers are willing to pay for this quantity of the product. The purple shaded area—the deadweight loss of the output quota—shows the overall loss of economic surplus as a result of the quota-induced output restriction.

One interesting consequence of the use of output quotas relates to the market value of the quotas themselves. When quota systems are used, firms initially issued quotas by the government are usually permitted to buy or sell quotas to each other or to new firms interested in entering the industry. The quota itself simply provides the holder permission to produce and sell in that industry, but the market value of the quota reflects the profitability of that production.

As you can see from Figure 5-8, the output restriction created by the quota leads to an increase in the product's price. If demand for the product is inelastic, as is the case in the dairy markets where quotas are commonly used, total income to producers rises as a result of the reduction in output. But since their output falls, firms' production costs are also reduced. The introduction of a quota system therefore leads to a rise in revenues and a fall in production costs—a clear benefit for producers! Not surprisingly, individual producers are often prepared to pay a high price to purchase quota from other producers because having more quota gives them the ability to produce more output.

There is a catch, however: Producers must incur a very high cost in order to purchase the quotas. For example, an average dairy farm in Manitoba has about 90 cows and produces about 2300 litres of milk per day. The market value of the quota required to produce this amount of milk is approximately $1.8 million. The ownership of quota therefore represents a considerable asset for those producers who were lucky enough to receive it (for free) when it was initially issued by the government. But for new producers

wanting to get into the industry, the need to purchase expensive quota represents a considerable obstacle. These large costs from purchasing the quota offset the benefits from selling the product at the (quota-induced) high price.

> ## myeconlab   ADDITIONAL TOPICS
>
> The agricultural sector offers an excellent setting in which to analyze the effects of government policies designed to support and stabilize producers' incomes. For more details about the challenges faced by farmers and the government's policy responses, look for **Agriculture and the Farm Problem** in the *Additional Topics* section of this book's MyEconLab.
>
> **www.myeconlab.com**

A Cautionary Word

In this chapter we have examined the effects of government policies to control prices in otherwise free and competitive markets, and we have shown that such policies usually have two results. First, there is a redistribution between buyers and sellers; one group is made better off while the other group is made worse off—at least as far as the economic value of production is concerned. Second, there is a reduction in the overall amount of economic surplus generated in the market; the result is that the outcome is inefficient and society as a whole is made worse off.

The finding that government intervention in otherwise free markets leads to inefficiency should lead one to ask why government would ever intervene in such ways. The answer in many situations is that the government policy is often motivated by the desire to help a specific group of people and that the overall costs are deemed to be a worthwhile price to pay to achieve the desired effect. For example, legislated minimum wages are often viewed by politicians as an effective means of reducing poverty—by increasing the wages received by low-wage workers. The costs such a policy imposes on firms, and on society overall, may be viewed as costs worth incurring to redistribute economic surplus toward low-wage workers. Similarly, the use of output quotas in certain agricultural markets is sometimes viewed by politicians as an effective means of increasing income to specific farmers. The costs that such quota systems impose on consumers, and on society as a whole, may be viewed by some as acceptable costs in achieving a redistribution of economic surplus toward these farmers.

In advocating these kinds of policies, ones that redistribute economic surplus but also reduce the total amount of economic surplus available, policymakers are making *normative* judgements regarding which groups in society deserve to be helped at the expense of others. These judgements may be informed by a careful study of which groups are most genuinely in need, and they may also be driven by political considerations that the current government deems important to its prospects for re-election. In either case, there is nothing necessarily "wrong" about the government's decision to intervene in these markets, even if these interventions lead to inefficiency.

The job of the economist is to carefully analyze the effects of such policies, taking care to identify both the distributional effects and the implications for the overall amount of economic surplus generated in the market. This is *positive* analysis, emphasizing the *actual*

effects of the policy rather than what might be *desirable*. These analytical results can then be used as "inputs" to the decision-making process, where they will be combined with normative and political considerations before a final policy decision is reached. In many parts of this textbook, we will encounter policies that governments implement (or consider implementing) to alter market outcomes, and we will examine the effects of those policies. A full understanding of why specific policies are implemented requires paying attention to the effects of such policies on both the overall amount of economic surplus and the distribution of that surplus.

Summary

5.1 The Interaction Among Markets   **LO ❶**

- Partial-equilibrium analysis is the study of a single market in isolation, ignoring events in other markets. General-equilibrium analysis is the study of all markets together.

- Partial-equilibrium analysis is appropriate when the market being examined is small relative to the entire economy.

5.2 Government-Controlled Prices   **LO ❷**

- Government price controls are policies that attempt to hold the price of some good or service at some disequilibrium value—a value that could not be maintained in the absence of the government's intervention.
- A binding price floor is set above the equilibrium price; a binding price ceiling is set below the equilibrium price.

- Binding price floors lead to excess supply. Either the potential sellers are left with quantities that cannot be sold, or the government must step in and buy the surplus.
- Binding price ceilings lead to excess demand and provide a strong incentive for black marketeers to buy at the controlled price and sell at the higher free-market (illegal) price.

5.3 Rent Controls: A Case Study of Price Ceilings   **LO ❸**

- Rent controls are a form of price ceiling. The major consequence of binding rent controls is a shortage of rental accommodations and the allocation of rental housing by sellers' preferences.

- Because the supply of rental housing is much more elastic in the long run than in the short run, the extent of the housing shortage caused by rent controls worsens over time.

5.4 An Introduction to Market Efficiency   **LO ❹**

- Demand curves show consumers' willingness to pay for each unit of the product. For any given quantity, the area below the demand curve shows the overall value that consumers place on that quantity of the product.
- Supply curves show the lowest price producers are prepared to accept in order to produce and sell each unit of the product. This lowest acceptable price for each additional unit reflects the firm's costs required to produce each additional unit.
- For any given quantity exchanged of a product, the area below the demand curve and above the supply curve (up to that quantity) shows the economic surplus generated by the production and consumption of those units.

- Economic surplus is a common measure of market efficiency. A market's surplus is maximized when the quantity exchanged is determined by the intersection of the demand and supply curves. This outcome is said to be efficient.
- Policies that intervene in otherwise free and competitive markets—such as price floors, price ceilings, and production quotas—generally lead to a reduction in the total amount of economic surplus generated in the market. Such policies are inefficient for society overall.

Key Concepts

Partial-equilibrium analysis
General-equilibrium analysis
Price controls: floors and ceilings
Allocation by sellers' preferences and
 by black markets

Rent controls
Short-run and long-run supply curves
 of rental accommodations
Economic surplus

Market efficiency
Inefficiency of price controls and
 production quotas

Study Exercises

1. Consider the market for straw hats on a tropical island. The demand and supply schedules are given below.

Price ($)	Quantity Demanded	Quantity Supplied
1	1000	200
2	900	300
3	800	400
4	700	500
5	600	600
6	500	700
7	400	800
8	300	900

a. The equilibrium price for straw hats is _____. The equilibrium quantity demanded and quantity supplied is _____.
b. Suppose the government believes that no islander should have to pay more than $3 for a hat. The government can achieve this by imposing a _____.
c. At the government-controlled price of $3 there will be a _____ of _____ hats.
d. Suppose now that the government believes the island's hat makers are not paid enough for their hats and that islanders should pay no less than $6 for a hat. They can achieve this by imposing a _____.
e. At the new government-controlled price of $6 there will be a _____ of _____ hats.

2. The following questions are about resource allocation in the presence of price ceilings and price floors.

a. A binding price ceiling leads to excess demand. What are some methods, other than price, of allocating the available supply?
b. A binding price floor leads to excess supply. How might the government deal with this excess supply?
c. Why might the government choose to implement a price ceiling?
d. Why might the government choose to implement a price floor?

3. Consider the market for some product X that is represented in the demand-and-supply diagram.
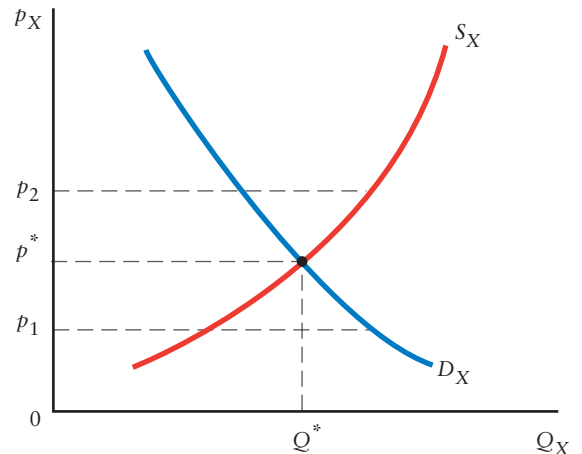
a. Suppose the government decides to impose a price floor at p_1. Describe how this affects price, quantity, and market efficiency.

b. Suppose the government decides to impose a price floor at p_2. Describe how this affects price, quantity, and market efficiency.

c. Suppose the government decides to impose a price ceiling at p_1. Describe how this affects price, quantity, and market efficiency.

d. Suppose the government decides to impose a price ceiling at p_2. Describe how this affects price, quantity, and market efficiency.

4. Consider the market for rental housing in Yourtown. The demand and supply schedules for rental housing are given in the table.

Price ($ per month)	Quantity Demanded (thousands of units)	Quantity Supplied (thousands of units)
1100	40	80
1000	50	77
900	60	73
800	70	70
700	80	67
600	90	65
500	100	60

a. In a free market for rental housing, what is the equilibrium price and quantity?

b. Now suppose the government in Yourtown decides to impose a ceiling on the monthly rental price. What is the highest level at which such a ceiling could be set, in order to have any effect on the market? Explain your answer.

c. Suppose the maximum rental price is set equal to $500 per month. Describe the effect on the rental-housing market.

d. Suppose a black market develops in the presence of the rent controls in (c). What is the black-market price that would exist if all of the quantity supplied were sold on the black market?

5. Explain and show in a diagram why the short-run effects of rent control are likely to be less significant than the long-run effects.

6. Consider the situation of Canadian barley farmers, who face weather conditions largely independent of those faced by barley growers in other countries. The incomes earned by the Canadian farmers, however, are affected by what happens to barley farmers in other countries. The key point is that Canadian barley farmers sell their barley on the same world market as all other barley farmers.

a. Show in a diagram of the world barley market how a bumper crop of European barley will push down the world barley price.

b. Show in a diagram of Canadian barley supply how a reduction in the world price of barley, *ceteris paribus*, will reduce the incomes of Canadian barley farmers.

c. Explain why Canadian barley farmers are made better off when there are crop failures in other parts of the world.

7. Consider the market for burritos in a hypothetical Canadian city, blessed with thousands of students and dozens of small burrito stands. The demand and supply schedules are shown in the table.

Price ($)	Quantity Demanded (thousands of burritos per month)	Quantity Supplied (thousands of burritos per month)
0	500	125
1.00	400	175
1.50	350	200
2.00	300	225
2.50	250	250
3.00	200	275
3.50	150	300
4.00	100	325
5.00	0	375

a. Graph the demand and supply curves. What is the free-market equilibrium in this market?

b. What is the total economic surplus in this market in the free-market equilibrium? What area in your diagram represents this economic surplus?

c. Suppose the local government, out of concern for the students' welfare, enforces a price ceiling on burritos at a price of $1.50. Show in your diagram the effect on price and quantity exchanged.

d. Are students better off as a result of this policy? Explain.

e. What happens to overall economic surplus in this market as a result of the price ceiling? Show this in the diagram.

8. Consider the market for milk in Saskatchewan. If p is the price of milk (cents per litre) and Q is the quantity of litres (in millions per month), suppose that the demand and supply curves for milk are given by

Demand: $p = 225 - 15Q^D$
Supply: $p = 25 + 35Q^S$

a. Assuming there is no government intervention in this market, what is the equilibrium price and quantity?

b. Now suppose the government guarantees milk producers a price of $2 per litre and promises to buy any amount of milk that the producers cannot sell. What are the quantity demanded and quantity supplied at this guaranteed price?

c. How much milk would the government be buying (per month) with this system of price supports?

d. Who pays for the milk that the government buys? Who is helped by this policy and who is harmed?

9. This question is related to the use of output quotas in the milk market in the previous question. Suppose the government used a quota system instead of direct price supports to assist milk producers. In particular, it issued quotas to existing milk producers for 1.67 million litres of milk per month.

a. If milk production is exactly equal to the amount of quotas issued, what price do consumers pay for milk?

b. Compared with the direct price controls in the previous question, whose income is higher under the quota system? Whose is lower?

10. This question relates to the section **Linkages Between Markets** found on the MyEconLab (**www.myeconlab. com**). In 1994, the Quebec and Ontario governments significantly reduced their excise taxes on cigarettes, but Manitoba and Saskatchewan left theirs in place. This led to cigarette smuggling between provinces that linked the provincial markets.

a. Draw a simple demand-and-supply diagram for the "Eastern" market and a separate one for the "Western" market.

b. Suppose that cigarette taxes are reduced in the Eastern market. Show the immediate effects.

c. Now suppose that the supply of cigarettes is (illegally) mobile. Explain and show what happens.

d. What limits the extent of smuggling that will take place in this situation?

Discussion Questions

1. "When an item is vital to everyone, it is easier to start controlling the price than to stop controlling it. Such controls are popular with consumers, regardless of their harmful consequences." Explain why it may be inefficient to have such controls, why they may be popular, and why, if they are popular, the government might nevertheless choose to decontrol these prices.

2. It is sometimes asserted that the overheated housing market is putting housing out of the reach of ordinary citizens. Who bears the heaviest cost when rentals are kept down by (a) rent controls, (b) a subsidy to tenants equal to some fraction of their rent payments, and (c) low-cost public housing?

3. "This year the weather smiled on us, and we made a crop," says a wheat farmer near Minnedosa in Manitoba. "But just as we made a crop, the economic situation changed." This quotation brings to mind the old saying, "If you are a farmer, the weather is always bad." Discuss the sense in which this saying might be true.

4. Severe floods recently swept through the American Midwest. Although many homes that flooded then do not typically flood, for many people this was only one in a long string of floods. However, after the waters receded, most people rebuilt their homes, generally with low-interest loans and disaster relief grants from the federal government. Discuss how the policy of subsidizing the reconstruction of property following floods affects the market for real estate in flood-prone areas. Is the outcome more or less efficient in the long run with such government intervention?

5. Gary Storey, a professor of agricultural economics at the University of Saskatchewan, made the following statement: "One of the sad truths of the agricultural policies in Europe and the United States is that they do very little for the future generations of farmers. Most of the subsidies get capitalized into higher land prices, creating windfall gains for current landowners (i.e., gains that they did not expect). It creates a situation where the next generation of farmers require, and ask for, increased government support."

a. Explain why subsidies to farmers increase land values and generate windfall gains to current landowners.

b. Some Canadian agricultural policies are based on the use of production quotas. Do such quota systems avoid the problem described by Professor Storey?

6. This question relates to the section **Linkages Between Markets** found on the MyEconLab (**www.myeconlab. com**). Governments often announce major spending increases on "infrastructure" programs—involving spending several billion dollars on bridges, highways, sewer systems, and so on. One of the alleged benefits of such programs is to create thousands of jobs, not only in the construction industry but also elsewhere in the economy as construction workers spend their now-higher incomes on cars, clothing, entertainment, and so on. Discuss how such spending would create jobs in the construction industry. Why would you expect some jobs to be lost in other industries as a result of this program?