4.1 Consumer Surplus and Producer Surplus

Learning Objective 1  Distinguish between the concepts of consumer surplus and producer surplus.

Consumer surplus measures the dollar benefit consumers receive from buying goods and services in a particular market. Producer surplus measures the dollar benefit firms receive from selling goods and services in a particular market. Economic surplus is the sum of consumer surplus plus producer surplus. When the government imposes a price ceiling or a price floor, the amount of economic surplus is reduced.

A. Consumer Surplus

*Consumer surplus* measures the difference between the highest price a consumer is willing to pay and the price the consumer actually pays. The demand curve can be used to measure the total consumer surplus in a market. Demand curves show the willingness of consumers to purchase a product at different prices. Consumers are willing to purchase a product up to the point where the marginal benefit of consuming a product is equal to its price. The *marginal benefit* is the additional benefit to a consumer from consuming one more unit of a good or service. The total amount of consumer surplus in a market is equal to the area below the demand curve and above the market price. This area represents the benefit to consumers in excess of the price they paid for a product.

B. Producer Surplus

Supply curves show the willingness of firms to supply a product at different prices. Firms will supply an additional unit of a product only if they receive a price equal to the additional cost of producing that unit. Marginal cost is the additional cost to a firm of producing one more unit of a good or service. Often, the marginal cost of producing a good increases as more of the good is produced during a given time period.

*Producer surplus* is the difference between the lowest price a firm would have been willing to accept and the price it actually receives. The total amount of producer surplus in a market is equal to the area above the market supply curve and below the market price.

C. What Consumer Surplus and Producer Surplus Measure
Consumer surplus measures the net benefit to consumers from participating in a market, rather than the total benefit. Consumer surplus is equal to the total benefit received from consumers minus the total amount they must pay to buy the good. Similarly, producer surplus measures the net benefit received by producers from participating in a market. Producer surplus in a market is equal to the total amount firms receive from consumers minus the cost of producing the good.

4.2 The Efficiency of Competitive Markets

Learning Objective 2 Understand the concept of economic efficiency.

A competitive market is a market with many buyers and sellers. An advantage of a market system is that it results in efficient outcomes.

A. Marginal Benefit Equals Marginal Cost in Competitive Equilibrium

Equilibrium in a competitive market results in the economically efficient level of output, where marginal benefit equals marginal cost.

B. Deadweight Loss

When the price of a good is above its equilibrium price, economic surplus is less than it would be at the equilibrium price. The reduction in economic surplus resulting from a market not being in competitive equilibrium is called the deadweight loss.

C. Economic Surplus and Economic Efficiency

Consumer surplus measures the benefit to consumers from buying a particular product and producer surplus measures the benefit to firms from selling a particular product. Therefore, economic surplus – the sum of the benefit to firms plus the benefit to consumers – is the best measure of the benefit to society from the production of a good or service. Equilibrium in a competitive market results in the greatest amount of economic surplus, or total net benefit to society, from the production of a good or service.

Economic efficiency is a market outcome in which the marginal benefit to consumers of the last unit produced is equal to its marginal cost of production, and in which the sum of consumer surplus and producer surplus is at a maximum.

4.3 Government Intervention in the Market: Price Floors and Price Ceilings

Learning Objective 3 Explain the economic effect of government imposed price ceilings and price floors.

Notice that not every individual is better off if a market is at its competitive equilibrium; economic surplus, or the total net benefit to society, is greatest at competitive equilibrium. Any individual producer would rather charge a higher price, and any individual consumer would rather pay a lower price than the
equilibrium price. Producers or consumers who are dissatisfied with the competitive equilibrium price can lobby the government to legally require that a different price be charged.

A. Price Floors: Government Policy in Agricultural Markets

The Great Depression affected every sector of the U.S. economy. Many farmers were unable to sell their products or could sell them only at very low prices. Farmers convinced the federal government to intervene to raise prices by setting price floors. Government intervention in agriculture has continued ever since. The price floor reduces the amount of economic surplus in a market and causes the marginal benefit of the last unit of output sold to be greater than the marginal cost of producing it. Therefore, a price floor reduces economic efficiency. The federal government’s farm programs often have resulted in large surpluses of wheat and other agricultural products. The government has usually bought surplus food or paid farmers to restrict supply by taking some land out of cultivation. Congress passed the Freedom to Farm Act of 1996 in order to phase out price floors and government purchases of surpluses and return to a free market in agriculture.

B. Price Ceilings: Government Rent Control Policy in Housing Markets

Support for governments setting price ceilings typically comes from consumers. New York is one of the cities that have rent controls, which put a ceiling on the maximum rent that landlords can charge for an apartment. In New York City, rent control has resulted in whole city blocks being abandoned by landlords who were unable to cover their costs with the rents they were allowed to charge.

C. Black Markets

Because rent control leads to a shortage of apartments, renters who would otherwise not be able to find apartments have an incentive to offer landlords rents above the legal maximum. Where governments try to control prices by setting price ceilings or price floors, buyers and sellers often find a way around the controls. The result is black markets where buying and selling take place at prices that violate government price regulations. Rent controls can lead to an increase in racial and other types of discrimination. With rent controls, more renters will be looking for apartments than there are apartments to rent. Landlords can afford to indulge their prejudices by refusing to rent to people they don’t like.

D. The Results of Government Price Controls: Winners, Losers, and Inefficiency

The winners with rent control are those who pay less for rent. Landlords may gain if they break the law by charging rents above the legal maximum and above what the equilibrium rents would be. The losers from rent control are the landlords who abide by the law, and renters who are unable to find apartments at the controlled price.

E. Positive and Normative Analysis of Price Ceilings and Price Floors

Economists are generally skeptical of government attempts to interfere with competitive market equilibrium. Our analysis of rent control and of the federal farm programs is positive analysis. Whether these programs are desirable or undesirable is a normative question.
4.4 The Economic Impact of Taxes

Learning Objective 4 Analyze the economic impact of taxes.

When the government taxes a good, it affects the market equilibrium for that good. One result of a tax is a decline in economic efficiency.

A. The Effect of Taxes on Economic Efficiency

When a government taxes a good or service, less of that good or service will be produced. Demand and supply curves are used to describe the deadweight loss that results from a tax. The true burden of a tax is not just the amount consumers and producers pay the government, but also the deadweight loss from the tax. The deadweight loss from a tax is referred to as the excess burden of the tax. A tax is efficient if it imposes a small excess burden relative to the tax revenue that it raises.

B. Tax Incidence: Who Actually Pays a Tax?

There can be an important difference between who is legally required to send a tax payment to the government and who actually bears the burden of the tax. Tax incidence is the actual division of the burden of the tax between buyers and sellers in a market. The incidence of a tax does not depend on whether a tax is collected from the buyers of a good or from the sellers.

Appendix

Quantitative Demand and Supply Analysis

Learning Objective: Use quantitative demand and supply analysis.

A. Demand and Supply Equations

The first step in a quantitative analysis of demand and supply is to supplement the use of demand and supply curves with demand and supply equations. For example, suppose that economists have estimated that the demand for apartments in New York City is

\[ Q^D = 3,000,000 - 1,000P \]

and the supply of apartments is

\[ Q^S = -450,000 + 1,300P \]

where \( Q^D \) represents the quantity of apartments demanded per month and \( Q^S \) is the quantity of apartments supplied per month, and \( P \) is the price, or rent. With no government intervention, we know that at competitive market equilibrium, quantity demanded equals quantity supplied.
\[ Q^D = Q^S \]

\[ 3,000,000 - 1,000P = -450,000 + 1,300P \]

We can use this equation to solve for the equilibrium monthly apartment rent by setting the demand equation equal to the supply equation.

\[ 3,000,000 - 1,000P = -450,000 + 1,300P \]

\[ 3,450,000P = 2,300P \]

\[ P = \frac{3,450,000}{2,300} = \$1,500 \]

We can then substitute this price back into either the supply equation or the demand equation to find the equilibrium quantity of apartments rented:

\[ Q^D = 3,000,000 - 1,000P = 3,000,000 - 1,500,000 \]

\[ Q^S = -450,000 + 1,300P = -450,000 + 1,300(1,500) = 1,500,000 \]

The demand equation and the supply equation can be used to determine the value for rent when the quantity demand is equal to zero and when the quantity supplied is equal to zero.

\[ Q^D = 0 = 3,000,000 - 1,000P \]

\[ P = \frac{3,000,000}{1,000} = \$3,000 \]

and

\[ Q^S = 0 = -450,000 + 1,300P \]

\[ P = \frac{-450,000}{-1,300} = \$346.15 \]