Chapter 3
Demand, Supply, and Market Equilibrium

Chapter Overview
This chapter provides an introduction to demand and supply concepts. Both demand and supply are defined and illustrated; determinants of demand and supply are listed and explained. The concept of equilibrium and the effects of changes in demand and supply on equilibrium price and quantity are explained and illustrated. The chapter also includes brief discussions of efficiency (productive and allocative), and price controls (floors and ceilings).

Instructional Objectives
After completing this chapter, students should be able to:

1. Explain who and what demand and supply represent.
2. Differentiate between demand and quantity demanded; and supply and quantity supplied.
3. Graph demand and supply curves when given demand and supply schedules.
4. State the Law of Demand and the Law of Supply, and explain why price and quantity demanded are inversely related, and why price and quantity supplied are directly related.
5. List the major determinants of demand, and explain how a change in each will affect the demand curve.
6. List the major determinants of supply, and explain how a change in each will affect the supply curve.
7. Explain the concept of equilibrium price and quantity.
8. Illustrate graphically equilibrium price and quantity.
9. Explain the rationing function of prices.
10. Define productive and allocative efficiency, and explain how competitive markets achieve them.
11. Explain and graph the effects of changes in demand and supply on equilibrium price and quantity, including simultaneous changes in demand and supply.
12. Define price ceilings and price floors, and provide examples.
13. Graph and explain the consequences of government-set prices.
14. Define and identify terms and concepts listed at the end of the chapter.

Lecture Notes
I. **Learning objectives** – In this chapter students will learn:
   A. What demand is and what affects it.
   B. What supply is and what affects it.
   C. How supply and demand together determine market equilibrium.
   D. How changes in supply and demand affect equilibrium prices and quantities.
   E. What government-set prices are and how they can cause product surpluses and shortages.
II. Markets

A. A market, as introduced in Chapter 2, is an institution or mechanism that brings together buyers (demanders) and sellers (suppliers) of particular goods and services.

B. This chapter focuses on competitive markets with:
   1. a large number of independent buyers and sellers.
   2. standardized goods.
   3. prices that are “discovered” through the interaction of buyers and sellers. No individual can dictate the market price.

C. The goal of the chapter is to explain the way in which markets adjust to changes and the role of prices in bringing the markets toward equilibrium.

III. Demand

A. Demand is a schedule that shows the various amounts of a product that consumers are willing and able to buy at each specific price in a series of possible prices during a specified time period.
   1. Example of demand schedule for corn is Figure 3.1.
   2. The schedule shows how much buyers are willing and able to purchase at five possible prices.
   3. The market price depends on demand and supply.
   4. To be meaningful, the demand schedule must have a period of time associated with it.

B. Law of demand is a fundamental characteristic of demand behavior.
   1. Other things being equal, as price increases, the corresponding quantity demanded falls.
   2. Restated, there is an inverse relationship between price and quantity demanded.
   3. Note the “other-things-equal” assumption refers to consumer income and tastes, prices of related goods, and other things besides the price of the product being discussed.
   4. Explanation of the law of demand:
      a. Diminishing marginal utility: The decrease in added satisfaction that results as one consumes additional units of a good or service, i.e., the second “Big Mac” yields less extra satisfaction (or utility) than the first.
      b. Income effect: A lower price increases the purchasing power of money income enabling the consumer to buy more at lower price (or less at a higher price) without having to reduce consumption of other goods.
      c. Substitution effect: A lower price gives an incentive to substitute the lower-priced good for now relatively higher-priced goods.

C. The demand curve:
   1. Illustrates the inverse relationship between price and quantity (see corn example, Figure 3.1).
   2. The downward slope indicates lower quantity (horizontal axis) at higher price (vertical axis), higher quantity at lower price, reflecting the Law of Demand.

D. Individual vs. market demand:
1. Transition from an individual to a market demand schedule is accomplished by summing
individual quantities at various price levels.

2. Market curve is horizontal sum of individual curves (see corn example, Tables 3.1, 3.2
and Figure 3.2).

E. Class example: This is a good place to involve the class if your classroom setting allows.
Select an item that students typically buy, such as a can of soft drink or donuts. It works
especially well if one student already has the item, and you can use that student for your
individual demand schedule. Select five to ten representative prices for the item and create a
demand schedule based on this student’s responses. It is usually interesting to include the
zero price to see how many the student would want if the item were free. You can then
construct an individual demand schedule on board or overhead transparency. Don’t worry if
it isn’t a straight line, it will undoubtedly still represent the law of demand. If your class
isn’t too large, you could then construct a class market schedule using a show of fingers to
indicate amounts students would purchase at each price level.

F. There are several determinants of demand or the “other things,” besides price, which affect
demand. Changes in determinants cause changes in demand.

1. Table 3.3 provides additional illustrations. (Key Question 3)
   a. Tastes—favorable change leads to increase in demand; unfavorable change to
decrease.
   b. Number of buyers—more buyers lead to an increase in demand; fewer buyers lead to
a decrease.
   c. Income—more leads to an increase in demand; less leads to decrease in demand for
normal goods. (The rare case of goods whose demand varies inversely with income
is called inferior goods).
   d. Prices of related goods also affect demand.
      i. Substitute goods (those that can be used in place of each other): The price of the
      substitute good and demand for the other good are directly related. If the price of
      Coke rises (because of a supply decrease), demand for Pepsi should increase.
      ii. Complementary goods (those that are used together like tennis balls and rackets):
      When goods are complements, there is an inverse relationship between the price
      of one and the demand for the other.
   e. Consumer expectations—consumer views about future prices and income can shift
demand.

2. A summary of what can cause an increase in demand:
   a. Favorable change in consumer tastes.
   b. Increase in the number of buyers.
   c. Rising income if product is a normal good.
   d. Falling incomes if product is an inferior good.
   e. Increase in the price of a substitute good.
   f. Decrease in the price of a complementary good.
   g. Consumers expect higher prices or incomes in the future.

3. A summary of what can cause a decrease in demand:
a. Unfavorable change in consumer tastes,

b. Decrease in number of buyers,

c. Falling income if product is a normal good,

d. Rising income if product is an inferior good,

e. Decrease in price of a substitute good,

f. Increase in price of a complementary good,

g. Consumers’ expectations of lower prices or incomes in the future.

G. Review the distinction between a change in quantity demanded caused by price change and a change in demand caused by change in determinants.

IV. Supply

A. Supply is a schedule that shows amounts of a product a producer is willing and able to produce and sell at each specific price in a series of possible prices during a specified time period.

1. A supply schedule portrays this such as the corn example in Figure 3.4.

2. Schedule shows what quantities will be offered at various prices or what price will be required to induce various quantities to be offered.

B. Law of supply:

1. Producers will produce and sell more of their product at a high price than at a low price.

2. Restated: There is a direct relationship between price and quantity supplied.

3. Explanation: Given product costs, a higher price means greater profits and thus an incentive to increase the quantity supplied.

4. Beyond some production quantity producers usually encounter increasing costs per added unit of output.

   Note: A detailed explanation of diminishing returns is probably not necessary at this point and can be delayed until a later consideration of the costs of production.

C. The supply curve:

1. The graph of supply schedule appears in Figure 3.5, which graphs data from Table 3.4.

2. It shows a direct relationship in an upward sloping curve.

D. Determinants of supply:

1. A change in any of the supply determinants causes a change in supply and a shift in the supply curve. An increase in supply involves a rightward shift, and a decrease in supply involves a leftward shift.

2. Six basic determinants of supply, other than price. (See examples of curve shifts in Figure 3.5 and summary Table 3.5 and Key Question 6.)

   a. Resource prices—a rise in resource prices will cause a decrease in supply or leftward shift in supply curve; a decrease in resource prices will cause an increase in supply or rightward shift in the supply curve.

   b. Technology—a technological improvement means more efficient production and lower costs, so an increase in supply, or rightward shift in the curve results.
c. Taxes and subsidies—a business tax is treated as a cost, so decreases supply; a subsidy lowers cost of production, so increases supply.
d. Prices of related goods—if price of substitute production good rises, producers might shift production toward the higher priced good, causing a decrease in supply of the original good.
e. Producer expectations—expectations about the future price of a product can cause producers to increase or decrease current supply.
f. Number of sellers—generally, the larger the number of sellers the greater the supply.

E. Review the distinction between a change in quantity supplied due to price changes and a change or shift in supply due to change in determinants of supply.

V. Supply and Demand: Market Equilibrium

A. Review the text example, Table 3.6, which combines data from supply and demand schedules for corn.

B. Have students find the point where quantity supplied equals the quantity demanded, and note this equilibrium price and quantity. Emphasize the correct terminology!
   1. At prices above this equilibrium, note that there is an excess quantity or surplus.
   2. At prices below this equilibrium, note that there is an excess quantity demanded or shortage.

C. Market clearing or market price is another name for equilibrium price.

D. Graphically, note that the equilibrium price and quantity are where the supply and demand curves intersect (See Figure 3.6). This is an IMPORTANT point for students to recognize and remember. Note that it is NOT correct to say supply equals demand!

E. Rationing function of prices is the ability of competitive forces of supply and demand to establish a price where buying and selling decisions are coordinated. (Key Question 8)

F. Consider This … Ticket Scalping: A Bum Rap!
   1. “Scalping” refers to the practice of reselling tickets at a higher-than-original price, which happens often with athletic and artistic events. Is this “ripping off” justified?
   2. Ticket re-sales are voluntary—both buyer and seller must feel that they gain or they would not agree to the transaction.
   3. “Scalping” market simply redistributes assets (tickets) from those who value them less than money to those who value them more than the money they’re willing to pay.
   4. Sponsors may be injured, but if that is the case, they should have priced the tickets higher.
   5. Spectators are not damaged, according to economic theory, because those who want to go the most are getting the tickets.
   6. Conclusion: Both seller and buyer benefit and event sponsors are the only ones who may lose, but that is due to their own error in pricing and they would have lost from this error whether or not the scalping took place.

G. Efficient allocation – productive and allocative efficiency
1. Competitive markets generate *productive efficiency* – the production of any particular good in the least costly way. Sellers that don’t achieve the least-cost combination of inputs will be unprofitable and have difficulty competing in the market.

2. The competitive process also generates *allocative efficiency* – producing the combination of goods and services most valued by society.

3. Allocative efficiency requires that there be productive efficiency. Productive efficiency can occur without allocative efficiency. Goods can be produced in the least costly method without being the most wanted by society.

4. Allocative and productive efficiency occur at the equilibrium price and quantity in a competitive market. Resources are neither over- nor underallocated based on society’s wants.

VI. Changes in Supply and Demand, and Equilibrium

A. Changing demand with supply held constant:
   1. Increase in demand will have effect of increasing equilibrium price and quantity (Figure 3.7a).
   2. Decrease in demand will have effect of decreasing equilibrium price and quantity (Figure 3.7b).

B. Changing supply with demand held constant:
   1. Increase in supply will have effect of decreasing equilibrium price and increasing quantity (Fig 3.7c).
   2. Decrease in supply will have effect of increasing equilibrium price and decreasing quantity (Fig 3.7d).

C. Complex cases—when both supply and demand shift (see Table 3.7):
   1. If supply increases and demand decreases, price declines, but new equilibrium quantity depends on relative sizes of shifts in demand and supply.
   2. If supply decreases and demand increases, price rises, but new equilibrium quantity depends again on relative sizes of shifts in demand and supply.
   3. If supply and demand change in the same direction (both increase or both decrease), the change in equilibrium quantity will be in the direction of the shift but the change in equilibrium price now depends on the relative shifts in demand and supply.

D. Consider This … Salsa and Coffee Beans

   1. Demand is an inverse relationship between price and quantity demanded, other things equal (unchanged). Supply is a direct relationship showing the relationship between price and quantity supplied, other things equal (unchanged). It can appear that these rules have been violated over time, when tracking the price and the quantity sold of a product such as salsa or coffee.
   2. Many factors *other* than price determine the outcome.
   3. If neither the buyers nor the sellers have changed, the equilibrium price will remain the same.
   4. The most important distinction to make is to determine if a change has occurred because of something that has affected the buyers or something that is influencing the sellers.
5. A change in any of the determinants of demand will shift the demand curve and cause a change in quantity supplied. (See Figure 3.7 a & b)

6. A change in any of the determinants of supply will shift the supply curve and cause a change in the quantity demanded. (See Figure 3.7 c & d)

7. Confusion results if “other things” (determinants) change and one does not take this into account. For example, sometimes more is demanded at higher prices because incomes rise, but if that fact is ignored, the law of demand seems to be violated. If income changes, however, there is a shift or increase in demand that could cause more to be purchased at a higher price. In this example, “other things” did not remain constant.

VII. Application: Government-Set Prices (Ceilings and Floors)

A. Government-set prices prevent the market from reaching the equilibrium price and quantity.

B. Price ceilings (gasoline).
   1. The maximum legal price a seller may charge, typically placed below equilibrium.
   2. Shortages result as quantity demanded exceeds quantity supplied (Figure 3.8).
   3. Alternative methods of rationing must emerge to take the places of the price mechanism. These may be formal (rationing coupons) or informal (lines at the pump).
   4. Black markets may emerge to satisfy the unmet consumer demand.
   5. Another example: Rent controls in large cities – intended to keep housing affordable but resulting in housing shortages.

C. Price floors (wheat)
   1. The minimum legal price a seller may charge, typically placed above equilibrium.
   2. Surpluses result as quantity supplied exceeds quantity demanded (Figure 3.9).
   3. Resources are overallocated to the production of wheat and consumers pay higher than efficient prices for wheat-based goods.
   4. Another example: Minimum wage

   Note: The federal minimum wage, for example, will be below equilibrium in some labor markets (large cities). In that case the price floor has no effect.

VIII. LAST WORD: A Market for Human Organs?

A. Organ transplants have become increasingly common, but not everyone who needs a transplant can get one. In 2005, there were 89,000 Americans on the waiting list. It is estimated that there are 4000 deaths per year in the U.S. because not enough organs are available.

B. Why shortages?
   1. No market exists for human organs.
   2. The demand curve for human organs would resemble others in that a greater quantity would be demanded at low prices than at higher prices.
   3. Donated organs that are rationed by a waiting list have a zero price. The existing supply is perfectly inelastic and is the fixed quantity offered by willing donors.
   4. There is a shortage of human organs because at a zero price the quantity demanded exceeds the quantity supplied.
C. Using a market.
   1. A market for human organs would increase the incentive to donate organs. The higher the expected price of an organ, the greater would be the number of people willing to have their organs sold at death.
   2. The shortage of organs would be eliminated, and the number of organs available for transplanting would rise.

D. Objections.
   1. The first is a moral objection that turning human organs into commodities commercializes human beings and diminishes the special nature of human life.
   2. An analytical critique based on the elasticity of supply, suggests that the likely increase in the actual number of usable organs for transplants would not be great.
   3. A health-cost concern suggests that a market for body organs would greatly increase the cost of health care.

E. Prohibitions on a human organ market have been rise to a worldwide, $1 billion-per-year illegal market. There is concern that those willing to participate in an illegal market such as this may also be willing to take extreme measures to solicit organs from unwilling donors.

F. Supporters of legalizing the market for organs argue that it would increase the supply of legal organs, drive down the price of organs, and reduce the harvesting of organs from unwilling sellers (the lower price would make it less profitable).