

SUMMARY

- The price elasticity of demand measures how much the quantity demanded responds to changes in the price. Demand tends to be more elastic if close substitutes are available, if the good is a luxury rather than a necessity, if the market is narrowly defined, or if buyers have substantial time to react to a price change.
- The price elasticity of demand is calculated as the percentage change in quantity demanded divided by the percentage change in price. If quantity demanded moves proportionately less than the price, then the elasticity is less than 1, and demand is said to be inelastic. If quantity demanded moves proportionately more than the price, then the elasticity is greater than 1, and demand is said to be elastic.
- Total revenue, the total amount paid for a good, equals the price of the good times the quantity sold. For inelastic demand curves, total revenue moves in the same direction as the price. For elastic demand curves, total revenue moves in the opposite direction as the price.
- The income elasticity of demand measures how much the quantity demanded responds to changes in consumers' income. The cross-price elasticity of demand measures how much the quantity demanded of one good responds to changes in the price of another good.
- The price elasticity of supply measures how much the quantity supplied responds to changes in the price. This elasticity often depends on the time horizon under consideration. In most markets, supply is more elastic in the long run than in the short run.
- The price elasticity of supply is calculated as the percentage change in quantity supplied divided by the percentage change in price. If quantity supplied moves proportionately less than the price, then the elasticity is less than 1, and supply is said to be inelastic. If quantity supplied moves proportionately more than the price, then the elasticity is greater than 1, and supply is said to be elastic.
- The tools of supply and demand can be applied in many different kinds of markets. This chapter uses them to analyze the market for wheat, the market for oil, and the market for illegal drugs.

KEY CONCEPTS

elasticity, p. 90

price elasticity of demand, p. 90

total revenue, p. 94

income elasticity of demand, p. 97

cross-price elasticity of demand, p. 97

price elasticity of supply, p. 98

QUESTIONS FOR REVIEW

1. Define the price elasticity of demand and the income elasticity of demand.
2. List and explain the four determinants of the price elasticity of demand discussed in the chapter.
3. What is the main advantage of using the midpoint method for calculating elasticity?
4. If the elasticity is greater than 1, is demand elastic or inelastic? If the elasticity equals 0, is demand perfectly elastic or perfectly inelastic?
5. On a supply-and-demand diagram, show equilibrium price, equilibrium quantity, and the total revenue received by producers.
6. If demand is inelastic how will an increase in price change total revenue? Explain.
7. What do we call a good whose income elasticity is less than 0?
8. How is the price elasticity of supply calculated? Explain what it measures.
9. What is the price elasticity of supply of Picasso paintings?

10. Is the price elasticity of supply usually larger in the short run or in the long run? Why?
11. How can elasticity help explain why drug interdiction could reduce the supply of drugs, yet possibly increase drug-related crime?

PROBLEMS AND APPLICATIONS

1. For each of the following pairs of goods, which good would you expect to have more elastic demand and why?
 - a. Levi-brand blue jeans or clothing
 - b. cigarettes over the next week or cigarettes over the next five years
 - c. insulin or Advil
 - d. business travel or vacation travel
2. Suppose that business travelers and vacationers have the following demand for airline tickets from New York to Boston:

Price	Quantity Demanded (business travelers)	Quantity Demanded (vacationers)
\$150	2,100 tickets	1,000 tickets
200	2,000	800
250	1,900	600
300	1,800	400

- a. As the price of tickets rises from \$200 to \$250, what is the price elasticity of demand for (i) business travelers and (ii) vacationers? (Use the midpoint method in your calculations.)
 - b. Why might vacationers have a different elasticity from business travelers?
3. Suppose the price elasticity of demand for heating oil is 0.2 in the short run and 0.7 in the long run.
 - a. if the price of heating oil rises from \$1.80 to \$2.20 per gallon, what happens to the quantity of heating oil demanded in the short run? In the long run? (Use the midpoint method in your calculations.)
 - b. Why might this elasticity depend on the time horizon?
4. A price change causes the quantity demanded of a good to decrease by 25 percent, while the total revenue of that good decreases by 10 percent. Is the demand curve elastic or inelastic? Explain.
5. The equilibrium price of coffee mugs rose sharply last month, but the equilibrium quantity was the same as ever. Three people tried to explain the situation. Which explanations could be right? Explain your logic.

BILLY: Demand increased, but supply was totally inelastic.

MARIAN: Supply increased, but so did demand.

VALERIE: Supply decreased, but demand was totally inelastic.
6. Suppose that your demand schedule for DVDs is as follows:

Price	Quantity Demanded (income = \$10,000)	Quantity Demanded (income = \$12,000)
\$ 8	40 DVDs	50 DVDs
10	32	45
12	24	30
14	16	20
16	8	12

- a. Use the midpoint method to calculate your price elasticity of demand as the price of DVDs increases from \$8 to \$10 if (i) your income is \$10,000 and (ii) your income is \$12,000.
 - b. Calculate your income elasticity of demand as your income increases from \$10,000 to \$12,000 if (i) the price is \$12 and (ii) the price is \$16.
7. You have the following information about good X and good Y:
 - Income elasticity of demand for good X: -3
 - Cross-price elasticity of demand for good X with respect to the price of good Y: 2

Would an increase in income and a decrease in the price of good Y unambiguously decrease the demand for good X? Why or why not?
8. Maria has decided always to spend one-third of her income on clothing.

- a. What is her income elasticity of clothing demand?
 - b. What is her price elasticity of clothing demand?
 - c. If Maria's tastes change and she decides to spend only one-fourth of her income on clothing, how does her demand curve change? What is her income elasticity and price elasticity now?
9. The *New York Times* reported (Feb. 17, 1996) that subway ridership declined after a fare increase: "There were nearly four million fewer riders in December 1995, the first full month after the price of a token increased 25 cents to \$1.50, than in the previous December, a 4.3 percent decline."
 - a. Use these data to estimate the price elasticity of demand for subway rides.
 - b. According to your estimate, what happens to the Transit Authority's revenue when the fare rises?
 - c. Why might your estimate of the elasticity be unreliable?
 10. Two drivers—Tom and Jerry—each drive up to a gas station. Before looking at the price, each places an order. Tom says, "I'd like 10 gallons of gas." Jerry says, "I'd like \$10 worth of gas." What is each driver's price elasticity of demand?
 11. Consider public policy aimed at smoking.
 - a. Studies indicate that the price elasticity of demand for cigarettes is about 0.4. If a pack of cigarettes currently costs \$2 and the government wants to reduce smoking by 20 percent, by how much should it increase the price?
 - b. If the government permanently increases the price of cigarettes, will the policy have a larger effect on smoking one year from now or five years from now?
 - c. Studies also find that teenagers have a higher price elasticity than do adults. Why might this be true?
 12. You are the curator of a museum. The museum is running short of funds, so you decide to increase revenue. Should you increase or decrease the price of admission? Explain.
 13. Pharmaceutical drugs have an inelastic demand, and computers have an elastic demand. Suppose that technological advance doubles the supply of both products (that is, the quantity supplied at each price is twice what it was).
 - a. What happens to the equilibrium price and quantity in each market?
 - b. Which product experiences a larger change in price?
 - c. Which product experiences a larger change in quantity?
 - d. What happens to total consumer spending on each product?
 14. Several years ago, flooding along the Missouri and the Mississippi rivers destroyed thousands of acres of wheat.
 - a. Farmers whose crops were destroyed by the floods were much worse off, but farmers whose crops were not destroyed benefited from the floods. Why?
 - b. What information would you need about the market for wheat to assess whether farmers as a group were hurt or helped by the floods?
 15. Explain why the following might be true: A drought around the world raises the total revenue that farmers receive from the sale of grain, but a drought only in Kansas reduces the total revenue that Kansas farmers receive.

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