LESSON SEVEN
PRICE CHANGES MATTER

INTRODUCTION

The law of demand states that as the price of a product increases, the quantity demanded decreases. Conversely, as price decreases, the quantity demanded increases. But that still leaves an important question: Will consumers purchase a great deal more or less when the price decreases or increases, respectively, or only a little more or a little less? Price elasticity of demand is a measure of consumers' responsiveness to price changes. Understanding price elasticity of demand helps students see more fully how businesses make pricing decisions and what governments must consider as they make decisions about taxing a particular product.

CONCEPTS

Demand
Price elasticity of demand

CONTENT STANDARDS

Economists describe the demand schedules for various goods and services as inelastic if the quantity responses to a change in price are relatively small compared to the change in price. If the quantity responses are relatively large, demand is described as elastic.

Demand for products that have few close substitutes and that make up a small part of the consumer's budget tends to be inelastic. Demand for products with many close substitutes and those that represent a large part of consumers' total budgets tends to be elastic.

Demand is typically more elastic in the long run than in the short run.

OBJECTIVES

◆ Define price elasticity of demand.

◆ Distinguish between elastic and inelastic demand.

◆ Describe the factors that tend to make demand elastic or inelastic.

◆ Use the total revenue test to determine if demand is elastic or inelastic.

◆ Use price elasticity of demand to analyze several kinds of economic problems.

LESSON DESCRIPTION

In this lesson, students examine the characteristics of products to determine price elasticity of demand, calculate changes in total revenue to determine elasticity, and analyze the impact of elasticity on public policy and business issues.

TIME REQUIRED

Three class periods. Day one—procedures 1 and 2. Day two—procedures 3-6. Day three—procedure 7 and Assessment.

MATERIALS

★ One copy of Activity 1 for each student
■ One copy of Activities 2 and 3 for each student
Transparency of Visual 1

PROCEDURE

1. Distribute a copy of Activity 1 to each student and instruct students to read Part I. Discuss:

A. What does the law of demand state? (Price and quantity demanded are inversely related.)

B. What is price elasticity of demand? (A measure of consumers' price responsiveness. It compares how much quantity demanded changes relative to a change in price.)

C. What is elastic demand? (A situation in which quantity demanded changes relatively *more* than price changes.)

D. What is inelastic demand? (A situation in which quantity demanded changes relatively *less* than price.)

E. What factors tend to affect the price elasticity of demand for a product? (Whether the

★ all students–basic course material
■ average and above average students

product has many or few substitutes, whether the product takes a large or small portion of consumers' budgets, and how long consumers have to react to price changes.)

2. Instruct students to complete Part II of Activity 1. When students are finished, discuss the answers.

3. Distribute a copy of Activity 2 to each student. Tell students to read Part I. Discuss:

A. What is total revenue? (Price times quantity demanded.)

B. What is the price effect on total revenue when price increases? (To increase total revenue, because each unit is sold for more.)

C. What is the quantity effect on total revenue when price increases? (To decrease total revenue, because fewer units will be sold at a higher price.)

D. What happens to total revenue when price increases? (It may go up or down, depending on whether the price or quantity effect is larger. If the price effect is greater than the quantity effect, total revenue will increase. If the price effect is less than the quantity effect, total revenue will decrease.)

E. What is the price effect on total revenue when price decreases? (To decrease total revenue, because each unit is sold for less.)

F. What is the quantity effect on total revenue when price decreases? (To increase total revenue, because more units will be sold at a lower price.)

G. What happens to total revenue when price decreases? (It may go up or down, depending on whether the price or quantity effect is larger. If the price effect is greater than the quantity effect, total revenue will decrease. If the price effect is less than the quantity effect, total revenue will increase.)

H. How would you describe elastic demand in terms of the price and quantity effects? (With elastic demand, the price effect is smaller than the quantity effect, so price and total revenue move in opposite directions.)

I. How would you describe inelastic demand in terms of the price and quantity effects? (With inelastic demand, the price effect is larger than the quantity effect, so price and total revenue move in the same direction.)

J. What would happen to total revenue if the price effect and quantity effect were the same? (Total revenue would stay the same. This is called unitary elastic demand.)

4. Instruct students to complete Part II of Activity 2. When finished, discuss the answers to the problems.

(Procedures 5 and 6 are designed for use in strong classes making extensive use of graphical analysis.)

5. Display Visual 1 to provide an alternative explanation of how elasticity of demand and total revenue are related. Explain that the top graph shows the demand for product A. At a price of $2, 10,000 units would be demanded and total revenue would be $20,000. If the price rose to $4, the quantity demanded would decrease to 6,000 units and the total revenue would be $24,000. Price and total revenue both increased so demand is inelastic in this price range. Explain that the \\\\ area shows the price effect on total revenue and the //// area shows the quantity effect on total revenue. The price effect is larger than the quantity effect, so the price change has a stronger influence on total revenue.

6. Explain that the bottom graph shows the demand for product B. Like product A, 10,000 units will be demanded at a price of $2. If the price rose to $4, however, the quantity demanded would decrease to 4,000 units and total revenue would be $16,000. In this case, price and total revenue moved in opposite directions, so the demand is elastic in this price range. The dia-

gram shows that the quantity effect is larger than the price effect.

7. Distribute a copy of Activity 3 to each student and tell them to follow the instructions. When students are finished, discuss the answers to the handout. This presents a good opportunity to make the point that incorrect assumptions about elasticity of demand can lead to poor policy choices.

ASSESSMENT

Tell students to assume that your school receives 30% of its supplies budget from selling soft drinks. The school board is considering raising the price of soft drinks 20¢ to earn more revenue to buy computer software. Have students conduct a market survey among students in the high school to determine how many cans of soft drinks students are buying per week at the current price and how many they would buy each week at the higher price. From this data, have them determine whether the demand is elastic or inelastic in this price range, and write a recommendation for the school board based on their research.

ACTIVITY 1
WHAT IS PRICE ELASTICITY OF DEMAND?

Name _____

Part I: Overview

According to the law of demand, quantity demanded decreases when price increases. When price decreases, quantity demanded increases. However, it's not enough to know in what direction quantity demanded changes in response to price changes. It is also important to know *how much* the quantity demanded changes. A business may decide not to increase the price of its product if consumers will buy *much less* of it at the higher price. But a business will certainly increase the price of its product if consumers will buy only a *little less* of it at the higher price.

The measure of how much quantity demanded changes relative to price changes is called **price elasticity of demand.** If the quantity demanded changes more than price, in percentage terms, demand is elastic. Elastic demand means the quantity demanded is very responsive to changes in price. If the quantity demanded changes relatively little, the good or service has an **inelastic** demand.

Several factors determine whether the demand for a product is elastic or inelastic in some price range.

Products that have many substitutes tend to have an elastic demand because it is easy to buy a substitute when its price rises. A product that has few substitutes tends to have an inelastic demand, because buyers don't have as much choice.

Goods and services that take a large portion of a consumer's budget tend to have an elastic demand because the price change has a bigger impact on the consumer's overall spending. Those that consume a small portion of a purchaser's budget tend to have an inelastic demand, because the impact of price changes for these products has a much smaller effect on the consumer's overall spending.

The more time consumers have to adjust to price changes, the more they will increase purchases in response to price decreases, and decrease purchases in response to price increases. Therefore, long-run demand tends to be more elastic than short-run demand.

Part II: Elastic or Inelastic?

Instructions: Determine whether the demand for the following items is price elastic or inelastic. Write your answer on the line after the item. Then write the reasons for your answer.

1. Salt _____

   Why? _____

   _____

ACTIVITY 1 (continued)

2. New cars_____ Why? _____

3. Pork chops_____ Why? _____

4. European vacation_____ Why? _____

5. Insulin_____ Why? _____

6. Insulin at one of four drug stores in a shopping mall _____ Why? _____

7. Gasoline purchases one day after a 20% price increase _____ Why? _____

8. Gasoline purchases one year after a 20% price increase _____ Why? _____

ACTIVITY 2
PRICE ELASTICITY AND THE TOTAL REVENUE TEST

Name _____

Part I: Overview

One way to determine price elasticity of demand is to examine what happens to total revenue when the price for a product changes. **Total revenue** is price times quantity demanded:

price	X	quantity demanded	=	total revenue
$10	X	150 items	=	$1,500

When the price for a good or service changes, the change in total revenue depends on the *relative* size of the changes in price and the quantity demanded. First there is a *price effect*—a change in the amount the seller receives for each unit sold.. The price effect of a price increase is to raise total revenue. The price effect of a decrease in price is to lower total revenue. However, there is also a *quantity effect.* Higher prices result in a decrease in quantity demanded, which means revenues are collected on fewer units. Therefore, the quantity effect of a price increase is to lower total revenue. On the other hand, when price decreases, quantity demanded increases, so revenues are collected on more units. That means the quantity effect of a price decrease is to increase total revenue.

The price effect and quantity effect work in opposite directions, so total revenue may go up or down whenever price changes. If the price effect is greater than the quantity effect, the demand will be inelastic. If the quantity effect is greater than the price effect, the demand will be elastic. By comparing the directions of the price and total revenue changes, you can determine whether the price effect or quantity effect is larger, and from that determine whether demand is elastic or inelastic.

Price	Total Revenue	Elasticity of Demand
		elastic
		elastic
		inelastic
		inelastic

Part II

To make sure you understand these points, complete the problems that follow, and circle the correct arrows in part C of each question. Then write whether the demand is elastic or inelastic in this range of prices. The first problem is completed for you.

ACTIVITY 2 (continued)

1. *Price rises* from $5 to $6. Quantity demanded decreases from 15 to 10.

   A. Old price x old quantity demanded = old total revenue
   5 15 75

   B. New price x new quantity demanded = new total revenue
   6 10 60

   C. P ↑ TR ↓ elastic

2. *Price falls* from $10 to $9. Quantity demanded increases from 100 to 110.

   A. Old price x old quantity demanded = old total revenue
   _____ _____ _____

   B. New price x new quantity demanded = new total revenue
   _____ _____ _____

   C. P TR _____

3. Price rises from $6 to $9. Quantity demanded decreases from 60 to 50.

   A. Old price x old quantity demanded = old total revenue
   _____ _____ _____

   B. New price x new quantity demanded = new total revenue
   _____ _____ _____

   C. P TR _____

4. Price falls from $6.50 to $6.00. Quantity demanded increases from 100 to 200.

   A. Old price x old quantity demanded = old total revenue
   _____ _____ _____

   B. New price x new quantity demanded = new total revenue
   _____ _____ _____

   C. P TR _____

ACTIVITY 2 (continued)

5. Price falls from $4.00 to $3.75. Quantity demanded increases from 300 to 400.

   A. Old price x old quantity demanded = old total revenue

   _____ _____ _____

   B. New price x new quantity demanded = new total revenue

   _____ _____ _____

   C. P TR _____

6. Why do price and total revenue go in opposite directions when the demand for the good is elastic?

   _____

   _____

7. Why do price and total revenue go in the same direction when the demand for the product is inelastic? _____

   _____

ACTIVITY 3
APPLYING ELASTICITY TO THE REAL WORLD

Name _____

Instructions: Each of the following stories contains an assumption about elasticity of demand. For each story:

A. State whether the assumption made about the elasticity of demand is correct or wrong.

B. Justify your answer.

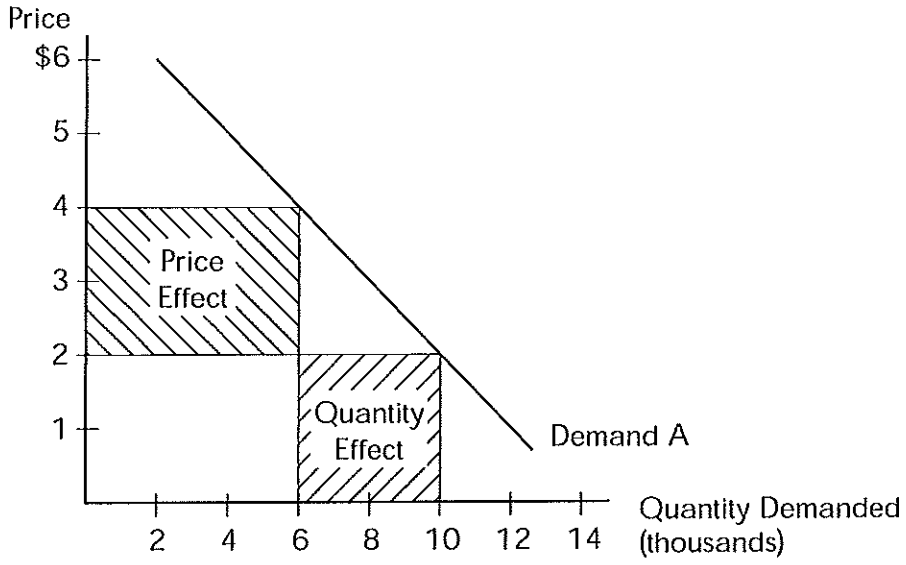
1. I. M. Politico, a candidate for the state legislature, is proposing a large increase in the tax on cigarettes and liquor. He says, "I'm not proposing these taxes to raise revenue, but to discourage reckless drinking and the filthy habit of smoking. If the prices of cigarettes and booze go up, most people will quit using them. After all, no one has to drink or smoke."

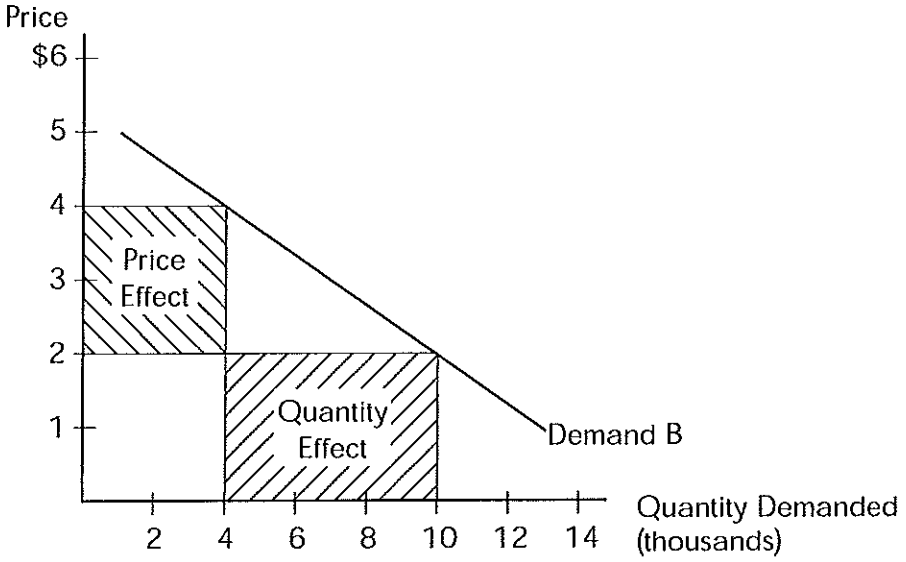
2. U. R. Kool, a candidate for Congress, proposes freezing the price of gasoline. "There is no substitute for gasoline," he says. "People have to get from one place to another. Economists who say higher prices will discourage people from buying as much gas as before don't live in the real world."

3. Councilman Vic Acqua opposed a price increase for water during a recent drought. He claimed that there is no substitute for water, and that therefore the demand for water is inelastic. He believes an increase in the price of water (with a water tax) will not cause the amount of water people use to go down at all.

4. Sky King, world traveler, says if the airlines want to attract more passengers, they should lower fares for business travelers as well as for vacationers. She believes both groups will respond equally to a price decrease.

VISUAL 1
COMPARING PRICE ELASTICITIES





VISUAL 1
COMPARING PRICE ELASTICITIES