



# ECO101: Introduction to Microeconomics

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SECTION: 11

WEEK 03, LECTURE 06

TOPIC: ELASTICITY

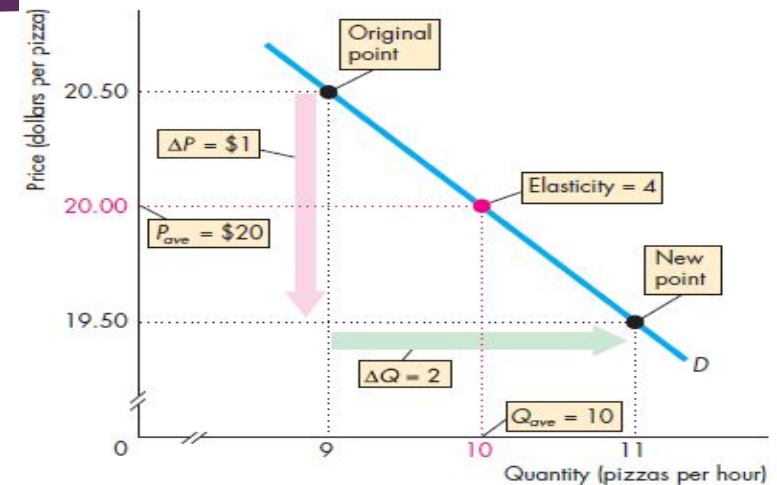
# Price Elasticity of Demand

- ▶ When supply increases, the equilibrium price falls and the equilibrium quantity increases.
- ▶ But does the price fall by a large amount and the quantity increase by a little? Or does the price barely fall and the quantity increase by a large amount?
- ▶ The answer depends on the responsiveness of the quantity demanded to a change in price.
- ▶ But what do we mean by responsiveness?
- ▶ Elasticity is a measure of the responsiveness of quantity demanded or quantity supplied to a change in one of its determinants.
- ▶ The **price elasticity of demand** is a units-free measure of the responsiveness of the quantity demanded of a good to a change in its price when all other influences on buying plans remain the same.

# Calculating Price Elasticity of Demand

- ▶ Price Elasticity of Demand = (percentage change in the quantity demanded) / (percentage change in price)
- ▶ To calculate the price elasticity of demand, we express the change in price as a percentage of the *average price* and the change in the quantity demanded as a percentage of the *average quantity*. By using the average price and average quantity, we calculate the elasticity at a point on the demand curve midway between the original point and the new point.
- ▶ We do this because it gives the most precise measurement of elasticity—at the midpoint between the original price and the new price.

FIGURE 4.2 Calculating the Elasticity of Demand



The elasticity of demand is calculated by using the formula: \*

$$\begin{aligned}\text{Price elasticity of demand} &= \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}} \\ &= \frac{\% \Delta Q}{\% \Delta P} \\ &= \frac{\Delta Q / Q_{ave}}{\Delta P / P_{ave}} \\ &= \frac{2/10}{1/20} = 4.\end{aligned}$$

# Elasticity

- ▶ Tell me why is elasticity is a unit free measure?
- ▶ Elasticity is a units-free measure because the percentage change in each variable is independent of the units in which the variable is measured. The ratio of the two percentages is a number without units.
- ▶ Can there be a minus sign in elasticity?
- ▶ When the price of a good *rises*, the quantity demanded *decreases*. Because a *positive* change in price brings a *negative* change in the quantity demanded, the price elasticity of demand is a negative number. But it is the magnitude, or *absolute value*, of the price elasticity of demand that tells us how responsive the quantity demanded is. So to compare price elasticities of demand, we use the *magnitude* of the elasticity and ignore the minus sign.

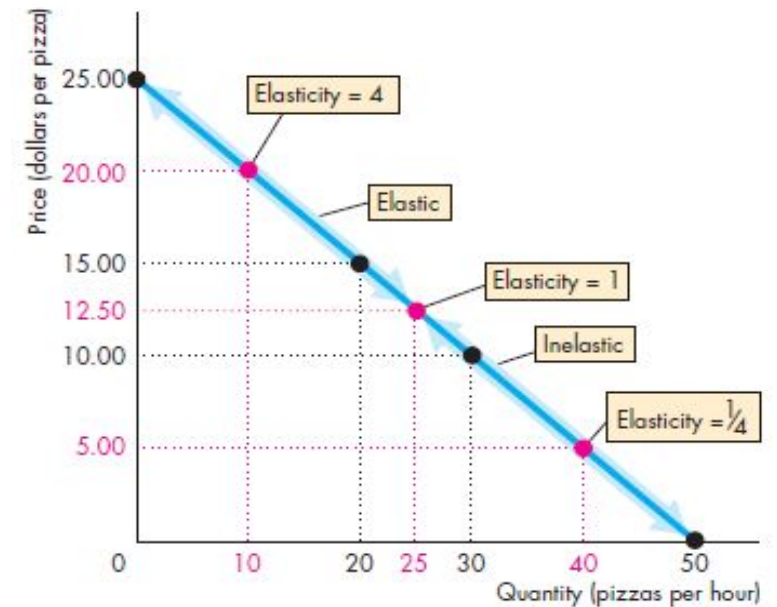
# Elastic and Inelastic Demand

- ▶ If the quantity demanded remains constant when the price changes, then the price elasticity of demand is zero and the good is said to have a **perfectly inelastic demand**.
- ▶ If the percentage change in the quantity demanded equals the percentage change in the price, then the price elasticity equals 1 and the good is said to have a **unit elastic demand**.
- ▶ The general case in which the percentage change in the quantity demanded is less than the percentage change in the price. In this case, the price elasticity of demand is between zero and 1 and the good is said to have an **inelastic demand**. Food and shelter are examples of goods with inelastic demand.
- ▶ If the quantity demanded changes by an infinitely large percentage in response to a tiny price change, then the price elasticity of demand is infinity and the good is said to have a **perfectly elastic demand**.
- ▶ the general case in which the percentage change in the quantity demanded exceeds the percentage change in price. In this case, the price elasticity of demand is greater than 1 and the good is said to have an **elastic demand**.

# Elasticity Along a Linear Demand Curve

- ▶ Elasticity and slope are not the same.
- ▶ A linear demand curve has a constant slope but a varying elasticity.
- ▶ \$5 fall in the price brings an increase of 10 pizzas an hour no matter what the initial price and quantity.
- ▶ At the midpoint of a linear demand curve, the price elasticity of demand is one.
- ▶ At prices *above* the midpoint, demand is elastic.
- ▶ At prices *below* the midpoint, demand is inelastic.

FIGURE 4.4 Elasticity Along a Linear Demand Curve



On a linear demand curve, demand is unit elastic at the midpoint (elasticity is 1), elastic above the midpoint, and inelastic below the midpoint.