

CHAPTER 4 - INDIVIDUAL AND MARKET DEMAND

Key Concepts and Topics

- Elasticity of Demand
- Consumer Surplus

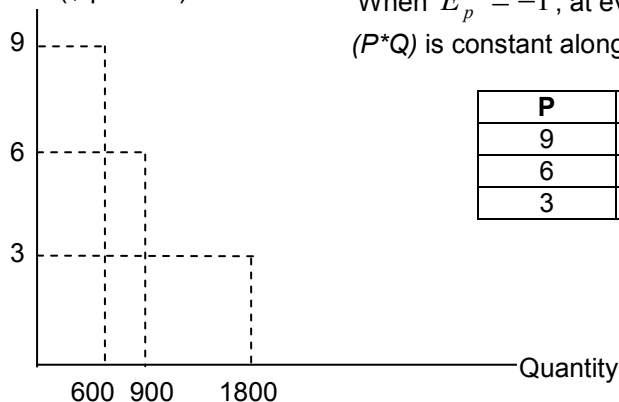
Elasticity of Demand

- Price Elasticity of Demand
 - Measures the percentage change in the *quantity demanded* resulting from a one-percent change in *price*

$$E_P^D = \frac{\% \Delta Q}{\% \Delta P} = \frac{\Delta Q / Q}{\Delta P / P} = \frac{\Delta Q}{\Delta P} * \frac{P}{Q}$$

- Inelastic demand (i.e., $|E_P^D| < 1$)
 - ♦ Q_D is relatively *unresponsive* to a price change (i.e., $\% \Delta Q < \% \Delta P$) \Rightarrow *total expenditure* ($P * Q$) \uparrow when $P \uparrow$
- Elastic demand (i.e., $|E_P^D| > 1$)
 - ♦ Q_D is relatively *responsive* to a price change (i.e., $\% \Delta Q > \% \Delta P$) \Rightarrow *total expenditure* ($P * Q$) \downarrow when $P \uparrow$
- Isoelastic demand
 - ♦ E_P^D is *constant* along the entire demand curve \Rightarrow demand curve *bows inward* (not linear)
 - ♦ Example: Unit-elastic demand (i.e., $E_P^D = -1$)
 - $P \uparrow \Rightarrow Q \downarrow$ but *no change* in total expenditure
- Unit-elastic demand curve

Price (\$ per unit)



When $E_P^D = -1$, at every price, the total expenditure ($P * Q$) is constant along the demand curve D

P	Q	P*Q
9	600	
6	900	
3	1800	

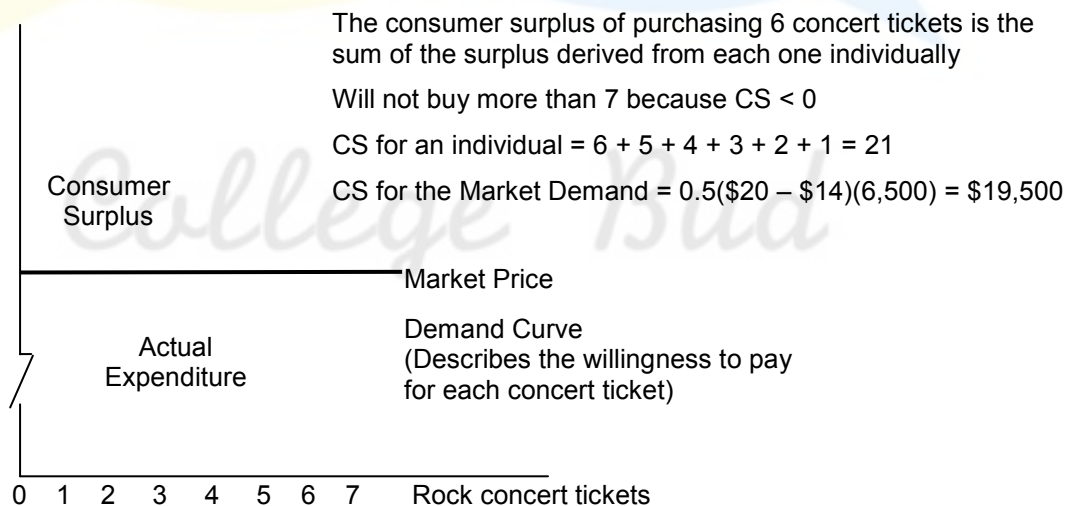
- Price elasticity and consumer expenditures

Demand	P ↑ , Expenditure	P ↓ , Expenditure
Inelastic		
Unit elastic		
Elastic		

- Point elasticity of demand: price elasticity of demand *at a particular point* on the demand curve, $E_p^D = (P/Q)(\Delta Q/\Delta P)$
- Arc elasticity of demand: price elasticity of demand calculated *over a range of prices*, $E_p^D = (\bar{P}/\bar{Q})(\Delta Q/\Delta P)$, where \bar{P} and \bar{Q} is the average of the *initial* and *final* price/quantity (*When is arc elasticity preferred to point elasticity?*)
Arc elasticity is preferred to point elasticity for a large price change

Consumer Surplus (CS)

- CS measures the *total benefit* from the consumption of a product, less the *total cost* of purchasing it (*in aggregate how much better off consumers are*)
 - The difference between the *maximum* price a consumer is willing to pay for a good and the *actual* price paid
 - The *area* below the *market demand* curve and above the *price line*
- Example: Consumers buying rock concert tickets at market price = \$14



- Applying CS
 - Combining CS with the aggregate profits that producers obtain (*producer surplus*) we can evaluate:
 1. *Costs and benefits* of different market structures
 2. *Public policies* that alter the behavior of *consumers* and *firms*

Quick Quiz

1. Suppose the arc income elasticity of demand for food is 0.5 and the arc price elasticity of demand is -1.0 . Suppose also that Felicia spends a \$10,000 a year on food, the price of food is \$2, and her income is \$25,000.
 - a. If a sales tax on food caused the price of food to increase to \$2.50, what would happen to her consumption of food?
 - b. Suppose that Felicia gets a tax rebate of \$2,500 to ease the effect of the sales tax. What would her consumption of food be now?
2. Suppose you are in charge of a toll bridge that costs essentially nothing to operate. The demand for bridge crossings Q is given by $P = 15 - 0.5Q$.
 - a. Draw the demand curve for bridge crossings.
 - b. How many people would cross the bridge if there were no toll?
 - c. What is the loss of consumer surplus associated with a bridge toll of \$5?
 - d. The toll bridge operator is considering an increase in the toll to \$7? At this higher price, how many people would cross the bridge? Would the toll bridge revenue increase or decrease? What does your answer tell you about the elasticity of demand?

College Bud