

# CHAPTER 6

# CHAPTER 6 - ELASTICITY

## Price Elasticity of Demand

- Law of demand: P goes down,  $Q_d$  goes up but **how much is the change in  $Q_d$ ?**
- The amount changes from product to product and over different price ranges.
- **Price elasticity of demand ( $E_d$ ) - Consumers' responsiveness to a price change**
- P goes up by a little and  $Q_d$  goes down by a lot = **Demand is elastic**
- P goes up by a lot and  $Q_d$  goes down by a little = **Demand is inelastic**
- $E_d = \frac{\% \text{ change in } Q_{dx}}{\% \text{ change of } P_x} = E_d = \frac{\text{change in } Q_{dx}}{\text{original } Q_{dx}} \div \frac{\text{change in } P_x}{\text{original } P_x}$

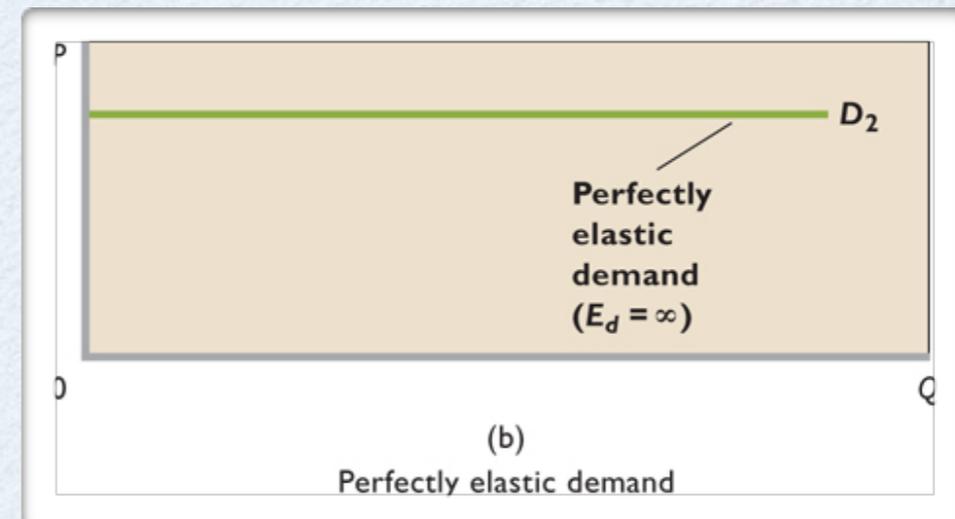
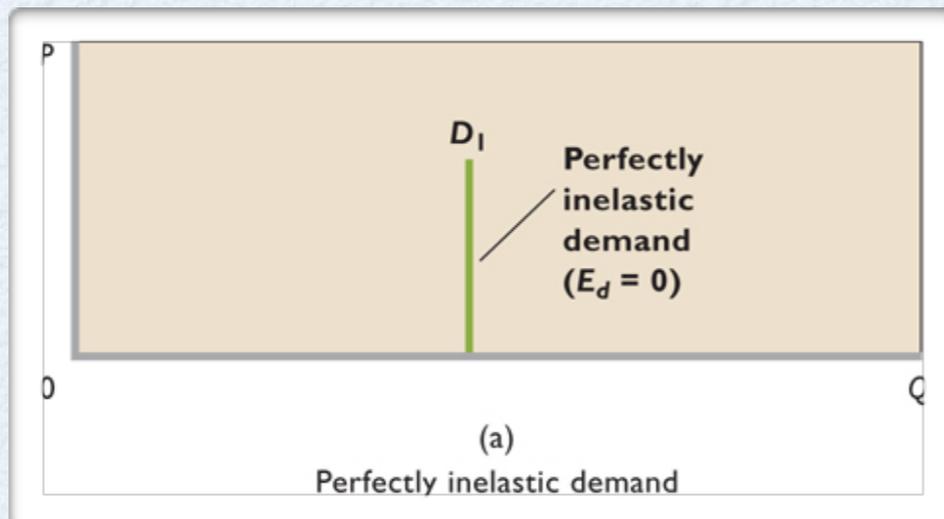
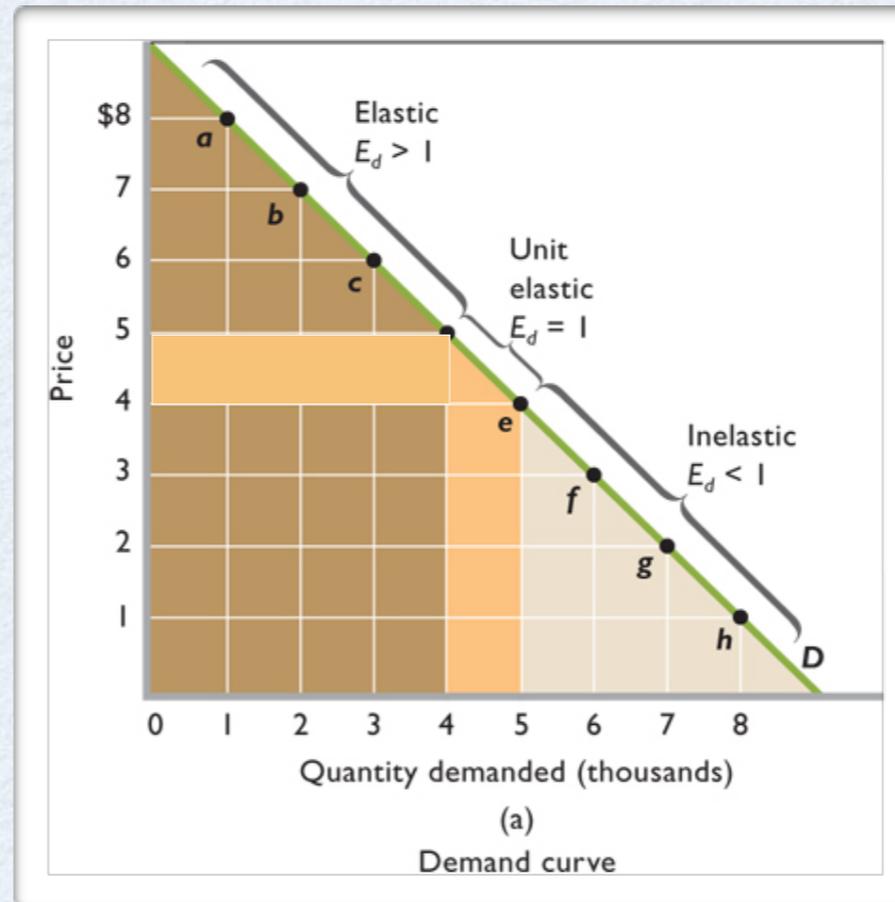
| P | Q |
|---|---|
| 5 | 4 |
| 4 | 5 |

- Price change \$4-\$5 =  $E_d = 1/4 \div 1/5 = 0.25 \div 0.20 = 1.25$  [elastic demand]
- Price change \$5-\$4 =  $E_d = 1/5 \div 1/4 = 0.20 \div 0.25 = 0.80$  [inelastic demand]

# Price Elasticity of Demand - Midpoint Formula

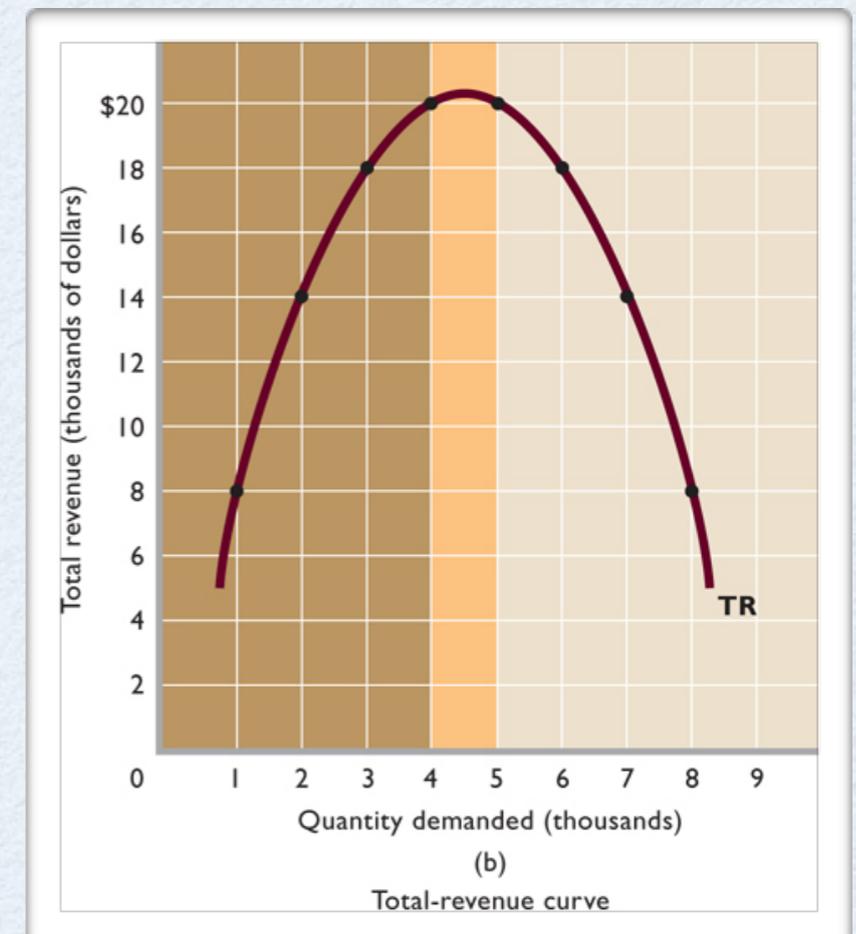
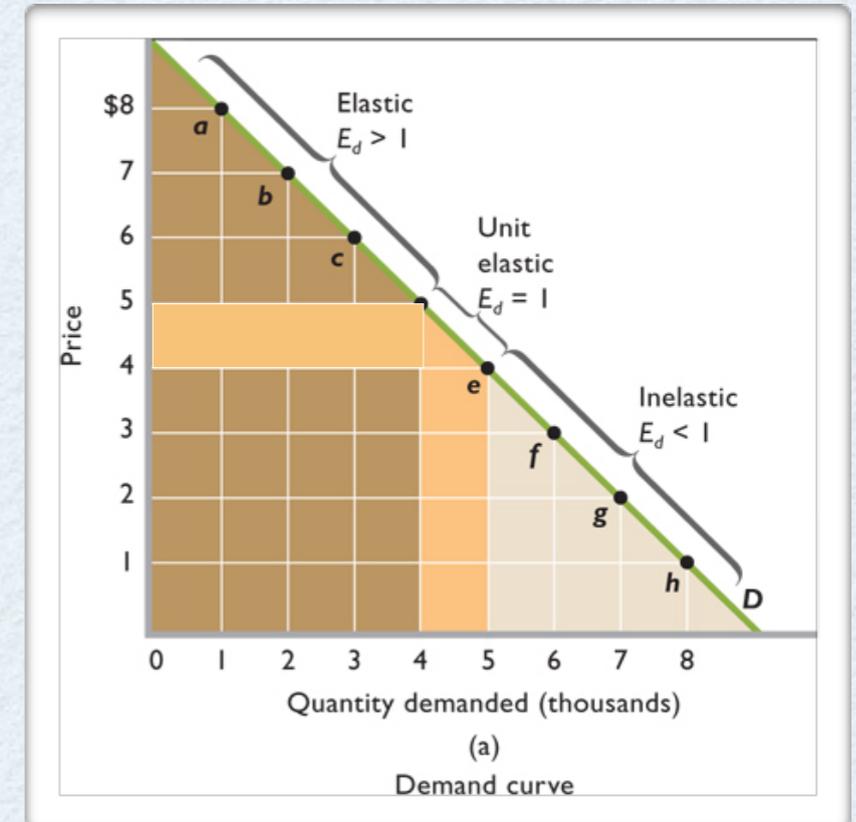
- $E_d = \frac{\text{change in } Q_d}{(\text{SUM } Q_d)/2} \div \frac{\text{change in } P}{(\text{SUM } P)/2}$
- $E_d = 1/(9/2) \div 1/(9/2) = 1$  [unitary elasticity] means: A 1% change (increase / decrease) in P will result in a 1% change in  $Q_d$  (decrease / increase).
- **Elastic demand:**  $E_d > 1$  = if the % change in P results in a **larger** % change in  $Q_d$
- **Inelastic demand:**  $E_d < 1$  = if the % change in P results in a **smaller** % change in  $Q_d$
- **Unitary elasticity :**  $E_d = 1$  = if the % change in P equals to the % change in  $Q_d$

# Price Elasticity of Demand - Midpoint Formula



# Total Revenue Test

- Change in P - ? change in TR
- $TR = P * Q$
- **Elastic demand:** P goes up, TR goes down; P goes down, TR goes up (price is lower but enough additional units will be sold to make up for the lower price);
- **Inelastic demand:** P goes down, TR goes down; P goes up TR goes up
- **Unitary elasticity:** Change in price, TR will stay constant

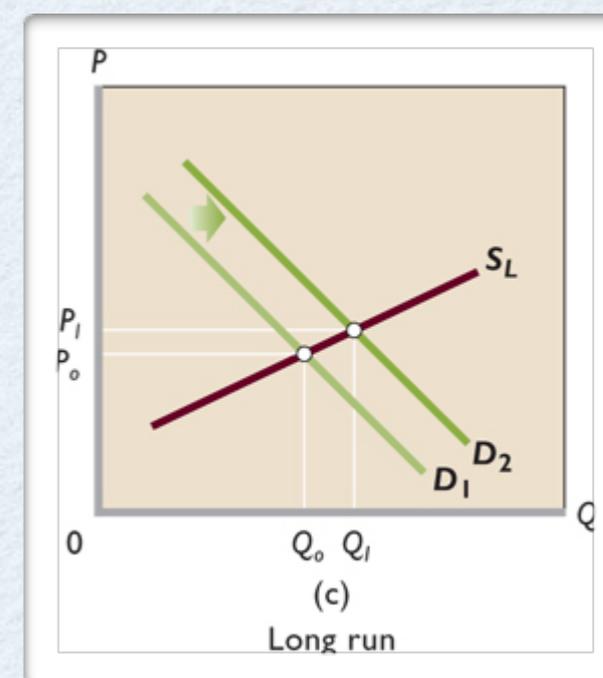
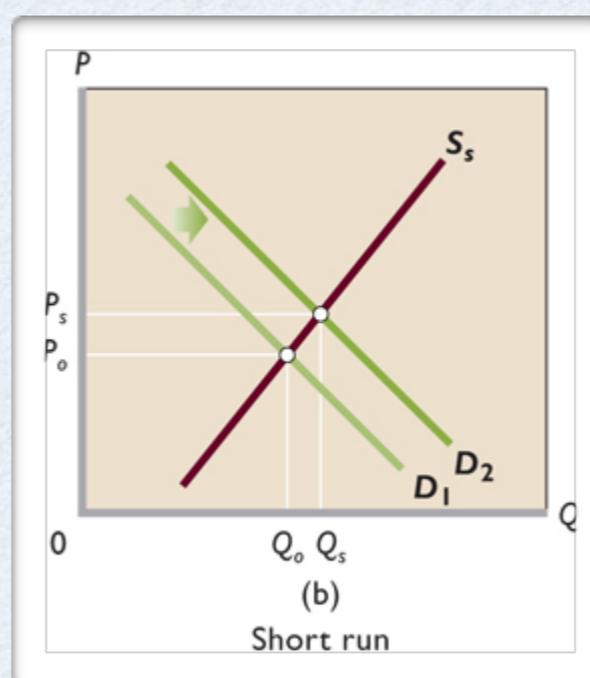
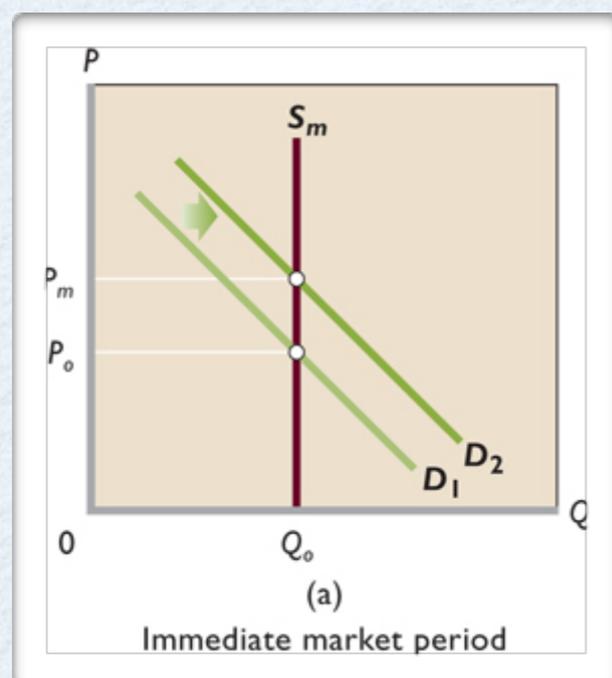


# Determinants of Price Elasticity of Demand

- **Substitutability** - the larger the number of substitutes, the greater the price elasticity of demand
- **Proportion of income** - the higher the price of a good relative to consumers' income, the greater the price elasticity of demand
- **Luxuries vs necessities** - luxuries - more elastic, necessities - more inelastic
- **Time** - the longer the time period, the more elastic the demand

# Price Elasticity of Supply

- $E_s = \frac{\text{change in } Q_s}{(\text{SUM } Q_s)/2} \div \frac{\text{change in } P}{(\text{SUM } P)/2}$
- If producers are relatively responsive to a price change, **supply is elastic**
- If producers are relatively insensitive to a price change, **supply is inelastic**
- The main determinant of price elasticity of supply is **time - market period** = the amount of time producers have to respond to a change in price



# Cross Elasticity of Demand

- **Cross elasticity of demand** - how sensitive are consumer purchases of one product to a change in price of an other product
- $E_{xy} = \frac{\% \text{ change } Q_{dx}}{\% \text{ change } P_y}$
- **Substitute goods** -  $E_{xy} = \text{positive}$ : as  $P_y$  goes up, the  $Q_x$  goes up. The larger the  $E_{xy}$  coefficient, the greater the substitutability
- **Complementary goods** -  $E_{xy} = \text{negative}$ : as  $P_y$  goes down,  $Q_x$  goes up. The larger  $E_{xy}$  the greater the complementarity
- **Independent goods** -  $E_{xy} = 0$ : unrelated, independent goods

# Income Elasticity of Demand

- **Income elasticity of demand** measures the degree to which consumers respond to a change in their incomes by buying more or less of a particular good
- $E_i = \frac{\% \text{ change } Q_d}{\% \text{ change income (Y)}}$
- **Normal goods:**  $E_i$  is positive, more of the good is demanded as income (Y) rises
- **Inferior goods:** Negative income elasticity infers that consumers decrease their purchases as income rises