



Degree in 
MECHANICAL ENGINEERING





Unit 8

Variables of the Marketing-mix Elasticity

Subject: Business I

Professor: Rocío Cortés Grao

 **Price** 

METHODS FOR PRICING

Elasticity - Price

The **price elasticity** is used to study the proportion that varies the quantity demanded of a good if there are changes in its price.


$$|E_d| = \frac{\Delta Q(\%)}{\Delta p(\%)}$$

Elastic (>1); Inelastic (<1); Unitary (=1)
 Q: quantity demanded; p: price

- If elastic demand: a decrease in prices X% will increase the quantity demanded by a higher X%.
- If inelastic demand: the opposite happens.

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Price




Class Exercise: Elasticity of the Demand

At a price of € 4 the quantity demanded of a particular good is 100 units.

1. Calculate the value of the price elasticity.
2. Explain what type of demand.
3. Plot the elasticity of demand


In each case:

- a) If the price increases to 5 € and quantity demanded decreases to 90 units.
- b) If the price increases to 5 € and quantity demanded decreases to 50 units.
- c) If the price increases to 5 € and quantity demanded decreases to 75 units.
- d) If the price increases to 5 € and quantity demanded remains unchanged.
- e) If the price stays the same and the quantity demanded increases to 10 units.



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Price



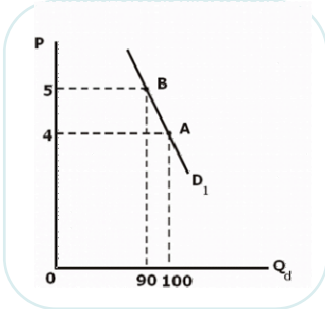
Class Exercise: Elasticity of the Demand

a) If the price increases to 5 € and quantity demanded decreases to 90 units.

$$|E_d| = \left| \frac{\% \Delta Q}{\% \Delta P} \right| = \left| \frac{\frac{\% \Delta Q}{Q}}{\frac{\% \Delta P}{P}} \right| = \left| \frac{\frac{90-100}{100} \times 100}{\frac{5-4}{4} \times 100} \right| = \left| \frac{-10}{25} \right| = |-0,40| = 0,40$$


$|E_d| = 0,40 < 1$

2.- The value obtained is less than the unit (0.5), so **the demand is inelastic** which means that a percentage change in price causes a lower and opposite in percentage change in quantity demanded.



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Price



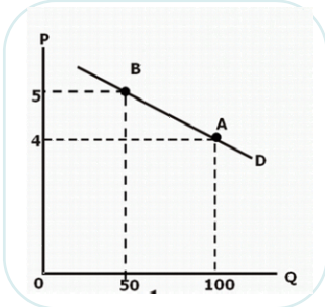
Class Exercise: Elasticity of the Demand

b) If the price increases to 5 € and quantity demanded decreases to 50 units.

$$|E_d| = \left| \frac{\% \Delta Q}{\% \Delta P} \right| = \frac{\frac{\frac{\Delta Q}{Q} \times 100}{\frac{\Delta P}{P} \times 100}}{\frac{\Delta P}{P} \times 100} = \frac{\frac{50-100}{100} \times 100}{\frac{5-4}{4} \times 100} = \left| \frac{-50}{25} \right| = |-2,00| = 2,00$$


$|E_d| = 2,00 > 1$

2.- The value obtained is greater than unity (2), so the **demand is elastic** which means that a percentage change in price causes a greater and opposite percentage change in quantity demanded.



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Price



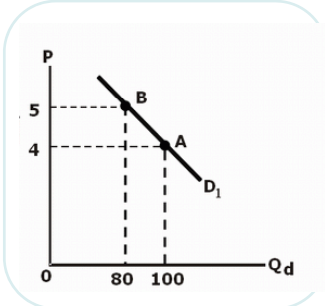
Class Exercise: Elasticity of the Demand


c) If the price increases to 5 € and quantity demanded decreases to 75 units.

$$|E_d| = \left| \frac{\% \Delta Q}{\% \Delta P} \right| = \frac{\frac{\frac{\Delta Q}{Q} \times 100}{\frac{\Delta P}{P} \times 100}}{\frac{\Delta P}{P} \times 100} = \frac{\frac{75-100}{100} \times 100}{\frac{5-4}{4} \times 100} = \left| \frac{-25}{25} \right| = |-1,00| = 1,00$$

$|E_d| = 1,00 = 1$

2.- The value obtained is equal to unity (1), so the **unitary elastic demand** which means that a percentage change in price causes a percentage change equal and opposite in quantity demanded.





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Price

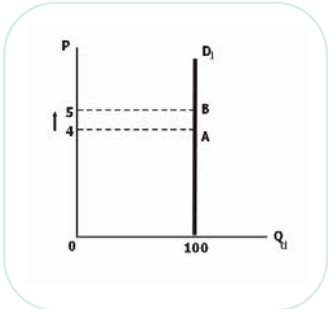
Class Exercise: Elasticity of the Demand


d) If the price increases to 5 € and quantity demanded remains unchanged.

$$|E_d| = \left| \frac{\% \Delta Q}{\% \Delta P} \right| = \left| \frac{\frac{\% \Delta Q}{Q}}{\frac{\% \Delta P}{P}} \right| = \left| \frac{\frac{100-100}{100} \times 100}{\frac{5-4}{4} \times 100} \right| = \left| \frac{0}{25} \right| = 0,00 = 0,00$$

$|E_d| = 0,00$

2.- The obtained value is zero (0), so the **Perfectly Inelastic Demand** which means that a percentage change in price does not cause a percentage change in quantity demanded. In this case, the quantity demanded is insensitive to price changes





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Price

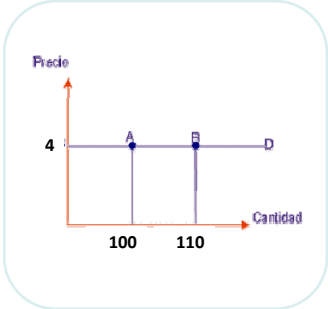
Class Exercise: Elasticity of the Demand


e) If the price stays the same and the quantity demanded increases to 10 units.

$$|E_d| = \left| \frac{\% \Delta Q}{\% \Delta P} \right| = \left| \frac{\frac{\% \Delta Q}{Q}}{\frac{\% \Delta P}{P}} \right| = \left| \frac{\frac{110-100}{100} \times 10}{\frac{4-4}{4} \times 10} \right| = \left| \frac{10}{0} \right| = \infty = \infty$$

$|E_d| = \infty$

2.- The obtained value is infinite, so the **Perfectly Elastic Demand** which means that a percentage change in price causes a large change in the quantity demanded. In this case, the quantity demanded is fully responsive to price changes.






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Price

Class Exercise: Elasticity of the Demand

At a price of 30 m.u. the quantity demanded of a particular good is 300 units. If price increases to 45 um, the quantity demanded decreases to 225 units.

1. Calculate the value of the price elasticity.
2. Explain what type of demand.
3. Plot the elasticity of demand





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Class Exercise: Elasticity of the Demand

Answer:

- 1.-

$$|E_d| = \left| \frac{\% \Delta Q}{\% \Delta P} \right| = \left| \frac{\frac{\% \Delta Q}{Q}}{\frac{\% \Delta P}{P}} \right| = \left| \frac{\frac{225-300}{300} \times 100}{\frac{45-30}{30} \times 100} \right| = \left| \frac{-25}{50} \right| = |-0,50| = 0,50$$

$|E_d| = 0,50 < 1$ **Graphic Plot**

2.- The value obtained is less than the unit (0.5), so the **demand is inelastic** which means that a percentage change in price causes a lower and opposite in percentage change in quantity demanded.

