Subject Area: Economics
Level: CSEC & CAPE
Curriculum Topic: Calculation of Elasticities of Demand
CSEC Economics Section 3 Objective 10
CAPE Economics Unit 1 Module 1 Objective 14

Key teaching points:

- Calculation of Price Elasticity of Demand.
- Calculation of Income Elasticity of Demand
- Calculation of Cross Elasticity of Demand

Revision Exercise - Calculation of Elasticities of Demand

Calculation of **Price elasticity of demand** (PED) - % change in quantity demanded divided by % change in price

Formula

$$\frac{\text{Change in quantity demanded}}{\text{Original quantity demanded}} \div \frac{\text{change in price}}{\text{original price}}$$

Example

Consumers demand 1000 pairs of shoes at a price of $100. After the price falls to $80, consumers now demand 2500 pairs. Calculate the price elasticity of demand.

$$\frac{\text{Change in quantity demanded}}{\text{Original quantity demanded}} \div \frac{\text{change in price}}{\text{original price}}$$

$$\frac{(2500-1000)}{1000} \div \frac{(100-80)}{100} = \frac{1500}{1000} \div \frac{20}{100} = \frac{15}{10} \times \frac{10}{2} = 7.5$$

Calculation of **Income elasticity of demand** (YED) - % change in quantity demanded divided by % change in income

Formula

$$\frac{\text{Change in quantity demanded}}{\text{Original quantity demanded}} \div \frac{\text{change in income}}{\text{original income}}$$

Example

The average income in a village is $10000. With that income, villagers purchase 500 bags of flour. The average income in the village increases to $15000. Villagers now purchase 1000 bags of flour. Calculate the income elasticity of demand.

$$\frac{\text{Change in quantity demanded}}{\text{Original quantity demanded}} \div \frac{\text{change in income}}{\text{original income}}$$

$$\frac{(1000-500)}{500} \div \frac{(15000-10000)}{10000} = \frac{500}{500} \div \frac{5000}{10000} = 1 \times \frac{10}{5} = 2$$

Calculation of **Cross elasticity of demand** (XED) - % change in quantity demanded of Good X divided by % change in price of Good Y

Formula

$$\frac{\text{Change in quantity demanded of Good X}}{\text{Original quantity demanded of Good X}} \div \frac{\text{change in price of Good Y}}{\text{original price of Good Y}}$$

Example
At a price of $25, 5000 snack boxes of KFC are demanded. The price of Royal Castle snack boxes reduces from $27 to $24. Now, 4500 KFC snack boxes are demanded. Calculate the Cross elasticity of demand between the two products.

$$\frac{5000-4500}{5000} \div \frac{27-24}{27} = \frac{500}{5000} \div \frac{3}{27} = \frac{5}{50} \times \frac{27}{3} = \frac{1}{10} \times \frac{9}{1} = \frac{9}{10} = 0.9$$

Practice Exercises

1. The price of a best-selling novel increases for $200 to $220. The quantity demanded fell from 1000 to 870. Calculate the price elasticity of demand.
2. The income of clerical staff at an organisation decrease from $5000 to $3500 due to a shortened work week. Their demand for rental units decreases from 700 to 500. Calculate the income elasticity of demand.
3. The price of the Pluto X3 phone decreases from $1200 to $1000. As a result customers decrease their demand for the MaxRange phone from 4000 units to 3200 units. Calculate the cross elasticity of demand.

Answer Key

1. PED = 1.3
2. YED = 0.95
3. XED = 1.2