# Price and Income Elasticity

**Specification requirement**— Price and income elasticity – the factors that determine them, calculating and using elasticity, their implications for revenue and profit.

## Price and Income Elasticity of Demand.

When prices change or peoples incomes change , people change their spending habits. They may more of one good if they earn more and less of another, or as the price of a good increases people may switch to purchasing something else, or they may feel that they have to continue buying the good, no matter what the price.

We measure how much changes in price or income alter demand for a good or service by calculating the elasticity of demand.

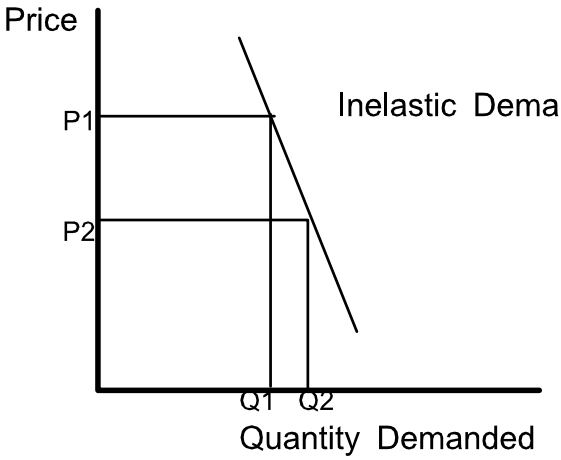
**Price elasticity of demand** measures the change in demand for a good or service that results from a change in price of the good

**Income elasticity of demand** measures the change in demand for a good or service that has been caused by a change in peoples income

**Levels of Elasticity of Demand.** There are three levels of elasticity, and each of these will apply to the both price and income elasticity of demand.

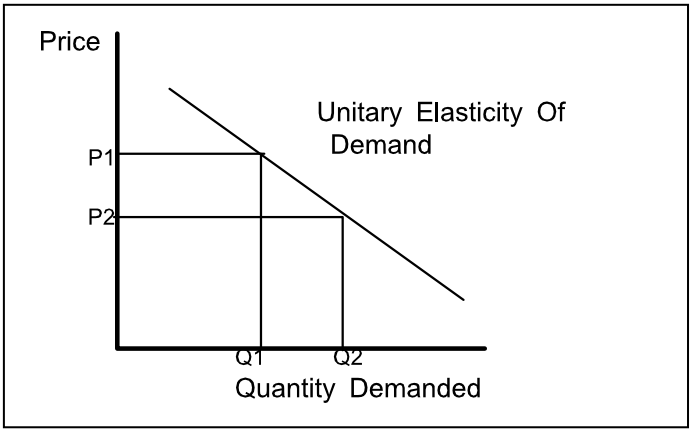
**Inelastic Demand.**
In this case a change in any of the three factors (price, income, or advertising expenditure), will cause a less than proportional change in the quantity demanded.

This is shown, and explained graphically below.



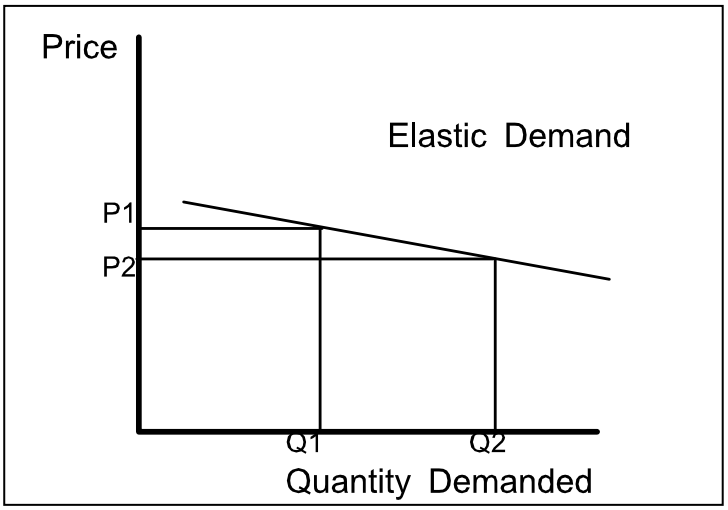

**A fall in price from P1 to P2, sees a less than proportional increase in quantity demanded from Q1 to Q2. This means that although sales have increased, the fall in revenue from each item sold means that total revenue has fallen. From a business point of view, if demand for the good is inelastic, revenues will fall if your price falls, so it rarely makes sense to cut prices.**

**Unitary Elasticity of Demand.** In this case a change in any of the three factors (price, income, or advertising expenditure), will cause an equally proportional change in the quantity demanded. This is shown, and explained graphically below.




**A fall in price from P1 to P2, sees a n equally proportional increase in quantity demanded from Q1 to Q2. This means that although sales have increased, the fall in revenue from each item sold means that total revenue has remained the same. From a business point of view, it makes sense to cut prices if increased output reduces costs, so increases profits.**

**Elastic Demand.** In this case a change in any of the three factors (price, income, or advertising expenditure), will cause a more than proportional change in the quantity demanded. This is shown, and explained graphically below.




**A fall in price from P1 to P2, sees a more than proportional increase in quantity demanded from Q1 to Q2. This means that although revenue from each item sold has fallen sales have increased more than proportionately, this means that total revenue has increased. From a business point of view, if demand for the good is elastic, revenues will increase if your price falls, so it can makes sense to cut prices.**

So putting the factors, and the types together we could, say the following.
A good or service has elastic price elasticity of demand (Ped) if a change in price of Good A, causes a more than proportional change in the quantity demanded of Good A. This works if price goes up or down.
A good or service has inelastic price elasticity of demand (Ped) if a change in price of Good A, causes a less than proportional change in the quantity demanded of Good A. Again this works if price goes up or down.
A good or service has elastic income elasticity of demand (Yed) if a change in incomes, causes a more than proportional change in the quantity demanded of Good A. This works if price goes up or down. If a change in income causes a less than proportional change in quantity demanded then the good has inelastic income elasticity of demand.

| | **Price Elasticity of Demand** |
|---|---|
| Inelastic | Necessities, such as water, power, basic foods. Addictive goods, such as cigarettes. |
| Unitary | Newspapers, books, every day items that are not necessities. |
| Elastic. | Goods that have lots of alternatives (substitutes), e.g. cornflakes, (other cereals), cinema ( hire a video, go to concert. Luxury goods, goods that can be done without e.g. expensive clothes, exotic holidays. |
| | **Income Elasticity Of Demand** |
| Inelastic | Basic goods such as water, toilet paper. If our incomes increase we do not rush madly to the shops to buy more loo roll |
| Unitary | Electrical goods, restaurant meals |
| Elastic | Luxuries. Exotic holidays, upmarket cars |

The table on the gives examples of goods and services that are likely to have each of the levels of elasticity,

Understanding the income and price elasticity of demand of a firms products is very important to business. A good understanding will give input to pricing policies, and help determine marketing and pricing strategy as peoples incomes rise and fall.

**Calculating Elasticity of Demand.**

In exams you may be required to calculate price or income elasticity of demand, or alternatively provided with a figure for price or income elasticity of demand and asked to calculate the effects on revenues or profits given a change in price, or income of customers.

**Note.** When you calculate elasticity of demand, then

If your answer is less than 1, the good has inelastic demand ( of any type)

If your answer is equal to 1, the good has unitary elasticity demand ( of any type)

If your answer is greater than 1, the good has elastic demand ( of any type)

The methods of calculating the Price elasticity of demand (Ped) and income elasticity of demand (Yed) are shown below.

Formulas.

$$\text{Price Elasticity of Demand} = \frac{\%\ \text{Change in Quanitity Demanded of Good A}}{\%\ \text{Change in Price of Good A}}$$

$$\text{Income Elasticity of Demand} = \frac{\%\ \text{Change in Quanitity Demanded of Good A}}{\%\ \text{Change in Income}}$$

Given the above formulas we can now calculate Ped and Yed.

**Example Question.**
A newspaper publisher puts up his price for his daily paper by 5p, from an original price of 40p. Sales fall from 450,000 to 375,000. What is the papers Price Elasticity of Demand?

**Step 1**. Calculate % change in price and quantity demanded.
% change in price. 5p as a % of 40p .
**% change in price = 12.5%**

Calculate % change in quantity demanded. Change is 75,000. So 75,000 as a % of original figure 450,000 .
**% change in quantity demanded = 16.67%**

**So Using the formula**

$$\text{Price Elasticity of Demand} = \frac{\%\ \text{Change in Quanitity Demanded of Good A}}{\%\ \text{Change in Price of Good A}}$$

$$\text{Price Elasticity of Demand} = \frac{16.7\%}{12.5\%} = 1.33$$

**Price Elasticity of Demand = 1.33**

**Calculating Change in Revenue.**

If you are asked to calculate change in revenue and are given an elasticity of demand, use the following steps.

**Example**. A firm sells adventure holidays, currently revenues are £175,000 per year. The good has an Income Elasticity of 2.5, that is it is income elastic. What will happen to demand and revenue if incomes increase by 10%.

Step 1. Multiply increase in incomes (10%) by Income Elasticity of Demand (2.5), =25%

Step 2. Calculate increase in sales, just add 25% to current sales,

175,000 times 25% = £43,750

so total sales now equal £175,000 + £43,750 = £218,750 and demand has increased by 25%.

**Effects of Elasticity of Demand on revenue.** The table below shows how elasticity of demand will effect revenue, if the firm increases or decreases the price of its goods.

| | **Inelastic** |
|---|---|
| **Increase Prices** | **Revenue Increases** |
| **Decrease Prices** | **Revenue Falls** |
| | **Elastic** |
| **Increase Prices** | **Revenue Falls** |
| **Decrease Prices** | **Revenue Increases** |