

**Vivekanand College, Kolhapur (Autonomous)**

**Department of Economics**

**Subject- Micro Economics**

**Topic- Elasticity of Demand: Meaning and Types**

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# Elasticity of Demand

- ▶ Elasticity can be defined as a measure of variable sensitivity to the change in another variable. This sensitivity is the change in price, which is related to change in other factors. From a business and economic point of view, it is a measure of how sensitive an economic factor is to another.
- ▶ Elasticity of Demand, or Demand Elasticity, is the **measure of change in quantity demanded of a product in response to a change in any of the market variables, like price, income etc.** It measures the shift in demand when other economic factors change.
- ▶ In other words, the elasticity of demand is the **percentage change in quantity demanded divided by the percentage change in another economic variable.**

▶ **The demand for a commodity is affected by different economic variables:**

1. Price of the commodity
2. Income level of consumers
3. Price of related commodities

▶ **So there are three types of elasticity of demand**

1. Price elasticity of demand
2. Income elasticity of demand
3. Cross elasticity of demand

# Price Elasticity of Demand

- ▶ Any change in the price of a commodity, whether it's a decrease or increase, affects the quantity demanded for a product.
- ▶ This measure of responsiveness of quantity demanded when there is a change in price is termed as the Price Elasticity of Demand.
- ▶ Price elasticity varies between zero to infinity. ( 0 to  $\infty$ )
- ▶ The mathematical formula given to calculate the Price Elasticity of Demand is:

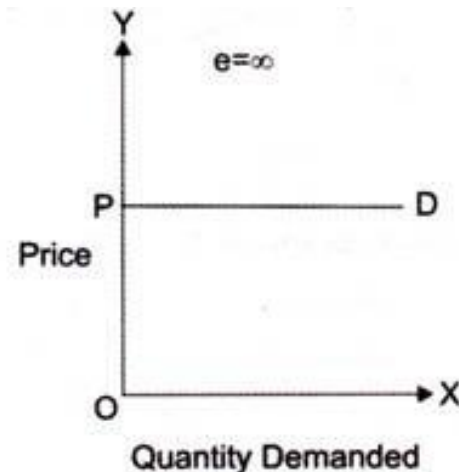
**Ep = % Change in Quantity Demanded / % Change in Price**

$$E_p = \Delta Q/Q * P/\Delta P$$

# Types of price elasticity of demand

## 1. Perfectly Elastic Demand:

- ▶ When a small change in price of a product causes a major change in its demand, it is said to be perfectly elastic demand.
- ▶ In perfectly elastic demand, a small rise in price results in fall in demand to zero, while a small fall in price causes increase in demand to infinity.
- ▶ In such a case, the demand is perfectly elastic or  $e_p = \infty$ .



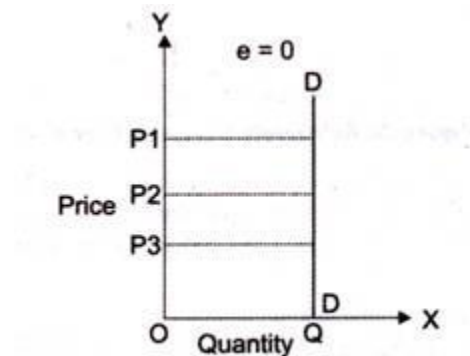
**Figure-2: Perfectly Elastic Demand**

- ▶ Though, perfectly elastic demand is a theoretical concept and cannot be applied in the real situation. However, it can be applied in cases, such as perfectly competitive market and homogeneity products. In such cases, the demand for a product of an organization is assumed to be perfectly elastic.

## 2. Perfectly Inelastic Demand:

- ▶ A perfectly inelastic demand is one when there is no change produced in the demand of a product with change in its price. The numerical value for perfectly inelastic demand is zero ( $e_p=0$ ).

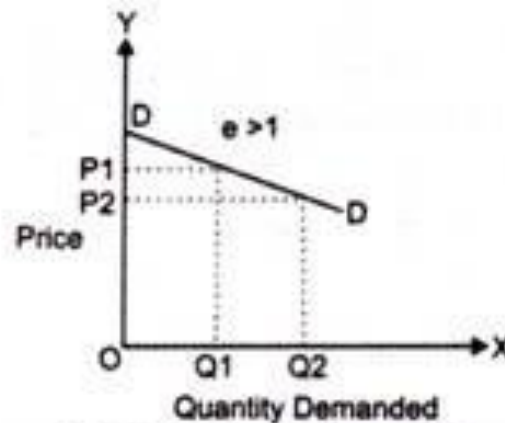
Perfectly inelastic demand is a theoretical concept and cannot be applied in a practical situation. However, in case of essential goods, such as salt, the demand does not change with change in price.



**Figure-3: Perfectly Inelastic Demand**

### 3. Relatively Elastic Demand:

- ▶ Relatively elastic demand refers to the demand when the proportionate change in quantity demanded is greater than the proportionate change in price of a product. The numerical value of relatively elastic demand ranges between one to infinity.
- ▶ Mathematically, relatively elastic demand is known as more than unit elastic demand ( $e_p > 1$ ). For example, if the price of a product increases by 20% and the demand of the product decreases by 25%, then the demand would be relatively elastic.

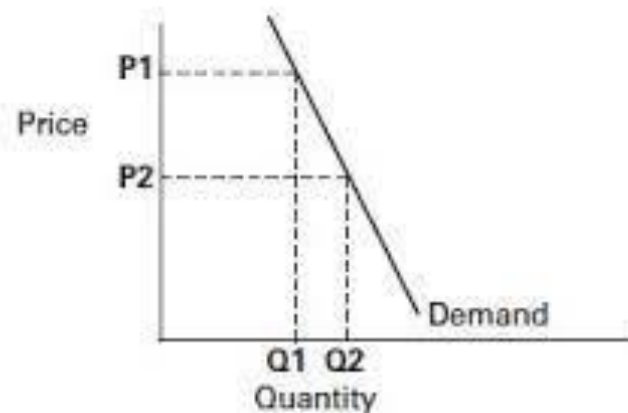


**Figure-4: Relatively Elastic Demand**

#### 4. Relatively Inelastic Demand:

- ▶ Relatively inelastic demand is one when the percentage change produced in demand is less than the percentage change in the price of a product.
- ▶ For example, if the price of a product increases by 30% and the demand for the product decreases only by 10%, then the demand would be called relatively inelastic.
- ▶ The numerical value of relatively inelastic demand ranges between zero to one ( $e_p < 1$ ).
- ▶ Marshall has termed relatively inelastic demand as elasticity being less than unity.

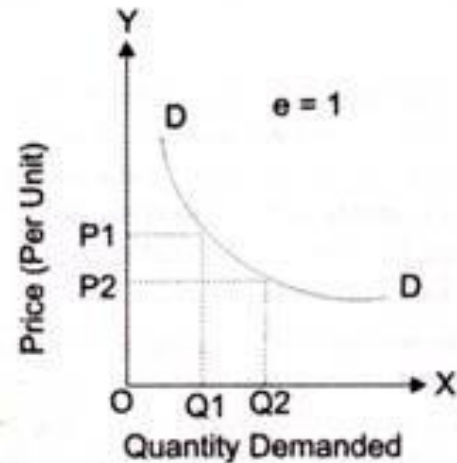
Figure 2. Inelastic Demand





#### 4. Unitary Demand:

- ▶ When the proportionate change in demand produces the same change in the price of the product, the demand is referred as unitary elastic demand.
- ▶ The numerical value for unitary elastic demand is equal to one ( $e_p=1$ ).



**Figure-6: Unitary Elastic Demand**

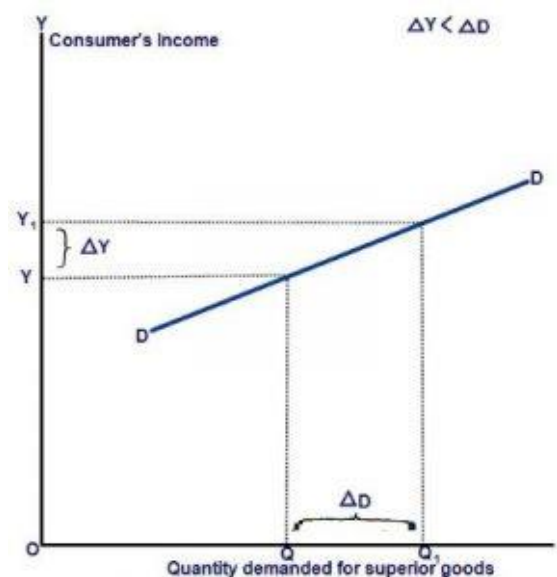
<b>Table-4: Price Elasticity of Demand</b>		
<b>Numerical Value</b>	<b>Type of Price Elasticity</b>	<b>Description</b>
$e_p = \infty$	Perfectly elastic demand	There is a greater change in demand in response to percentage or smaller change in the price. For example, the demand for a product decreases or completely stops, with a little change in its price and vice versa.
$e_p = 0$	Perfectly inelastic demand	Consumers do not respond to the demand for a product with increase or decreases in its price. This implies that the demand remains the same with change in the price.
$e_p > 1$	Relatively elastic demand	The percentage change in the quantity demanded of a product is greater than percentage change in its price. In such a case, consumers generally switch to new brands when the price of a particular brand increases. However, some consumers are loyal to the same brand.
$e_p < 1$	Relatively inelastic demand	The change in the demand of a product is less than that of change in its price.
$e_p = 1$	Unitary elastic demand	The change in the demand and change in the price of a product is same.

# Income Elasticity of Demand

- ▶ Income elasticity of demand measures the responsiveness of demand for a particular good to changes in consumer income.
- ▶ The higher the income elasticity of demand for a particular good, the more demand for that good is tied to fluctuations in consumer's income.
- ▶ For example, businesses typically evaluate the income elasticity of demand for their products to help predict the impact of a business cycle on product sales.
- ▶ **Types of income elasticity of demand-**
  1. Positive income elasticity of demand
  2. Negative income elasticity of demand
  3. Unitary income elasticity of demand

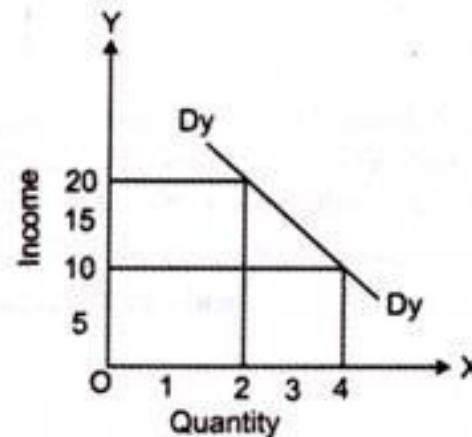
# 1. Positive income elasticity of demand

- ▶ A rise in income comes with bigger increases in the quantity demanded.
- ▶ As income of the consumer increase demand for the product will also increase but more than change in income.
- ▶ For example income increased by 10% but demand for particular commodity increased by 30%.



## 2. Negative income elasticity of demand

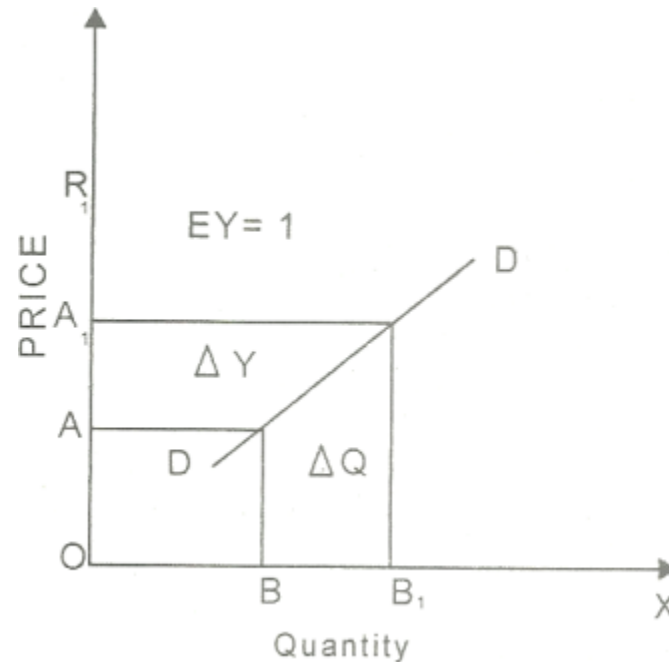
- ▶ An increase in income comes with a decrease in the quantity demanded.
- ▶ As income of the consumer increases demand for the product will decrease.
- ▶ And if consumer's income decreases then demand for that product will increase.
- ▶ Inferior goods have a negative income elasticity of demand; as consumers' income rises, they buy fewer inferior goods.



**Figure-13: Negative Income Elasticity of Demand**

### 3. Unitary income elasticity of demand

- ▶ The rise in income is proportionate to the increase in the quantity demanded.
- ▶ As income of the consumer increases or decreases demand for the product will also increase or decreases in same proportion.
- ▶ For example income increased by 10% and demand for particular commodity increased by 10%.



# Cross Elasticity of Demand

The cross elasticity of demand is an economic concept that measures the responsiveness in the quantity demanded of one good when the price for another good changes.

Also called cross-price elasticity of demand, this measurement is calculated by taking the percentage change in the quantity demanded of one good and dividing it by the percentage change in the price of the other good.

## Formula for calculation-

$$E_{xy} = \frac{\% \text{ change in quantity of X}}{\% \text{ change in price of Y}}$$

# Cross Elasticity of Demand

$$E_{xy} = \frac{\Delta Q_x}{Q_x} * \frac{P_y}{\Delta P_y}$$

If the price of coffee rises from Rs. 45 per 250 grams to Rs. 55 per 250 grams per pack and as a result the consumer's demand for tea increases from 600 to 800 packs then the cross elasticity of demand of tea is?