

## 2.8

### Law of Demand

Demand is essential for the creation, survival and profitability of a firm. *“Demand in economics is the desire to possess something and the willingness and the ability to pay a certain price in order to possess it”.*

–J. Harvey

*“Demand in economics means desire backed up by enough money to pay for the good demanded”*

–Stonier And Hague

#### 2.8.1 Characteristics of Demand

- **Price** : Demand is always related to price.
- **Time** : Demand always means demand per unit of time, per day, per week, per month or per year.
- **Market** : Demand is always related to the market, buyer and sellers.
- **Amount**: Demand is always a specific quantity which a consumer is willing to purchase.

#### 2.8.2 Demand Function

Demand depends upon price. This means demand for a commodity is a function of price. Demand function mathematically is denoted as,

$D = f(P)$  where,  $D$  = Demand,  $f$  = function  
 $P$  = Price

#### 2.8.3 Law of Demand

The Law of Demand was first stated by Augustin Cournot in 1838. Later it was refined and elaborated by Alfred Marshall.

### Definitions

The Law of Demand says as “the quantity demanded increases with a fall in price and diminishes with a rise in price”.

–Marshall

“The Law of Demand states that people will buy more at lower price and buy less at higher prices, other things remaining the same”.

- Samuelson

### Assumptions of Law of Demand

1. The income of the consumer remains constant.
2. The taste, habit and preference of the consumer remain the same.
3. The prices of other related goods should not change.
4. There should be no substitutes for the commodity in study.
5. The demand for the commodity must be continuous.
6. There should not be any change in the quality of the commodity.

Given these assumptions, the law of demand operates. If there is change even in one of these assumptions, the law will not operate.

Table 2.4 Demand Schedule

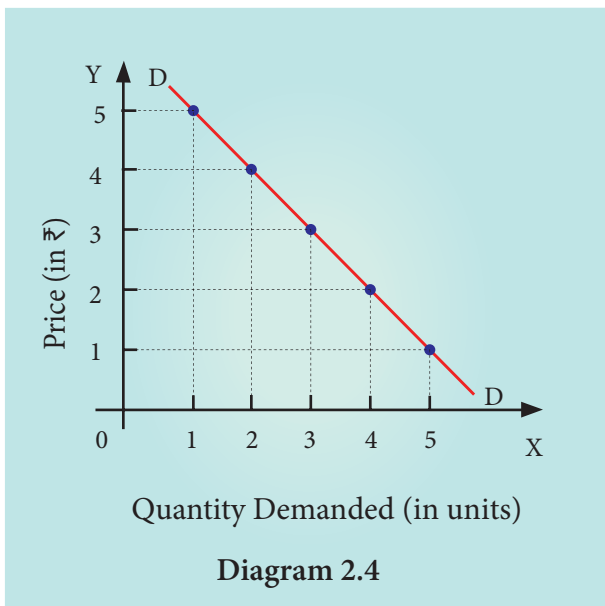
Price	Quantity Demanded
5	1
4	2
3	3
2	4
1	5

### Explanation

The law of demand explains the relationship between the price of a commodity and the quantity demanded of it. This law states



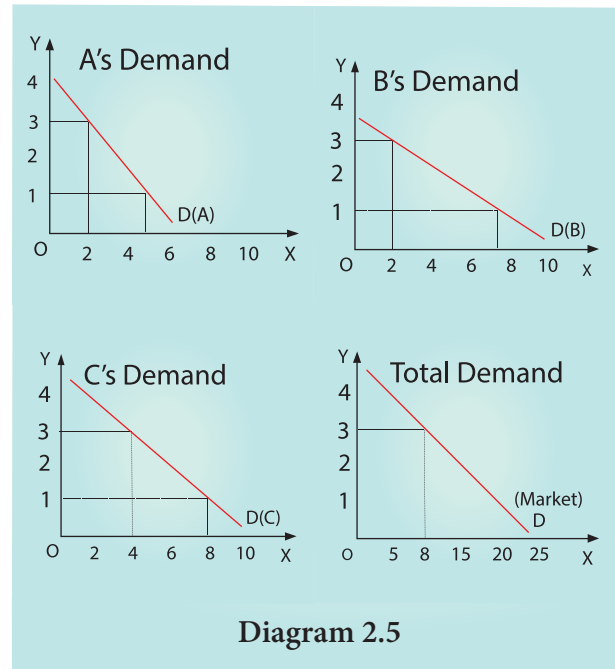
that quantity demanded of a commodity expands with a fall in price and contracts with a rise in price. In other words, a rise in price of a commodity is followed by a contraction demand and a fall in price is followed by extension in demand. Therefore, the law of demand states that there is an inverse relationship between the price and the quantity demanded of a commodity.



In the diagram 2.4, X axis represents the quantity demanded and Y axis represents the price of the commodity. DD is the demand curve, which has a negative slope i.e., slope downward from left to right which indicates that when

price falls, the demand expands and when price rises, the demand contracts.

## Market Demand for a Commodity



The market demand curve for a commodity is derived by adding the quantum demanded of the commodity by all the individuals constituting the market. In the diagram given above, the final market demand curve represents the addition of the demand curve of the individuals A, B and C at the same price.

When Price is ₹3, the Market demand is  $2+2+4 = 8$

When Price is ₹1, the Market demand is  $6+8+8 = 22$

As in the case of individual demand schedule, the Market Demand Curve is at a price, at a place and at a time.

### 2.8.4 Determinants of Demand

1. **Changes in Tastes and Fashions:** The demand for some goods and services

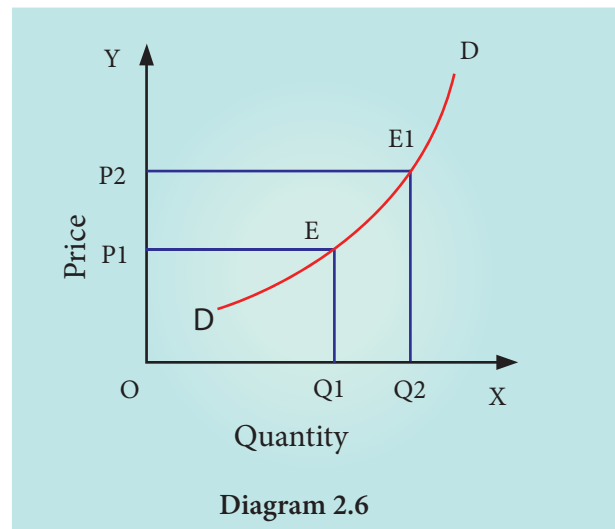
is very susceptible to changes in tastes and fashions

2. **Changes in Weather:** An unusually dry summer results in a increase in the demand for cool drinks.
3. **Taxation and Subsidy:** If fresh taxes are levied or the existing rates of taxation on commodities are increased their prices go up. The subsidies will bring down the prices. Therefore taxes reduce demand and subsidies raise demand.
4. **Changes in Expectations:** Expectations also bring about a change in demand. Expectation of rise in price in future results in increase in demand.
5. **Changes in Savings:** Savings and demand are inversely related.
6. **State of Trade Activity:** During the periods of boom and prosperity, the demand for all commodities tends to increase. On the contrary, during times of depression there is a general slackening of demand.
7. **Advertisement:** In advanced capitalistic countries advertising is a powerful instrument increasing the demand in the market.
8. **Changes in Income:** An increase in family income may increase the demand for durables like video recorders and refrigerators. Equal distribution of income enables poor to get more income. As a result consumption level increases.
9. **Change in Population:** The demand for goods depends on the size of population. An increase in population tends to increase the demand for goods and a decrease in population

tends to decrease the demand (if other things remain constant).

### 2.8.5 Exceptions to the law of demand

Normally, the demand curve slopes downwards from left to right. But there are some unusual demand curves which do not obey the law and the reverse occurs. A fall in price brings about a contraction of demand and a rise in price results in an extension of demand. Therefore the demand curve slopes upwards from left to right. It is known as exceptional demand curve.



In the diagram 2.6, DD is the demand curve which slopes upwards from left to right. It shows that when price is  $OP_1$ ,  $OQ_1$  is the demand and when the price rises to  $OP_2$ , demand also extends to  $OQ_2$ .

### 2.8.6 Reasons for Exceptional Demand Curve

1. **Giffen Paradox:** The Giffen good or inferior good is an exception to the law of demand. When the price of an inferior good falls, the poor will buy less and vice versa.

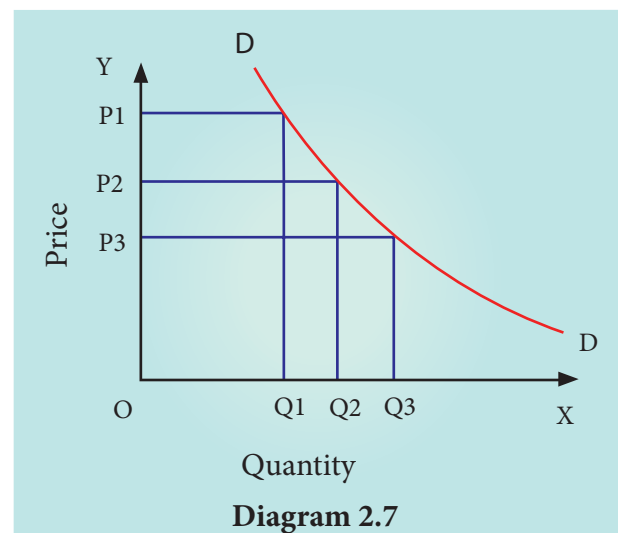
2. **Veblen or Demonstration effect:** Veblen has explained the exceptional demand curve through his doctrine of conspicuous consumption. Rich people buy certain goods because it gives social distinction or prestige. For example, diamonds.
3. **Ignorance:** Sometimes, the quality of the commodity is judged by its price. Consumers think that the product is superior if the price is high. As such they buy more at a higher price.
4. **Speculative effect:** If the price of the commodity is increasing then the consumers will buy more of it because of the expectation that it will increase still further. Eg stock markets.
5. **Fear of shortage:** During times of emergency or war, people may expect shortage of a commodity and so buy more.

### 2.8.7 Extension and Contraction of Demand

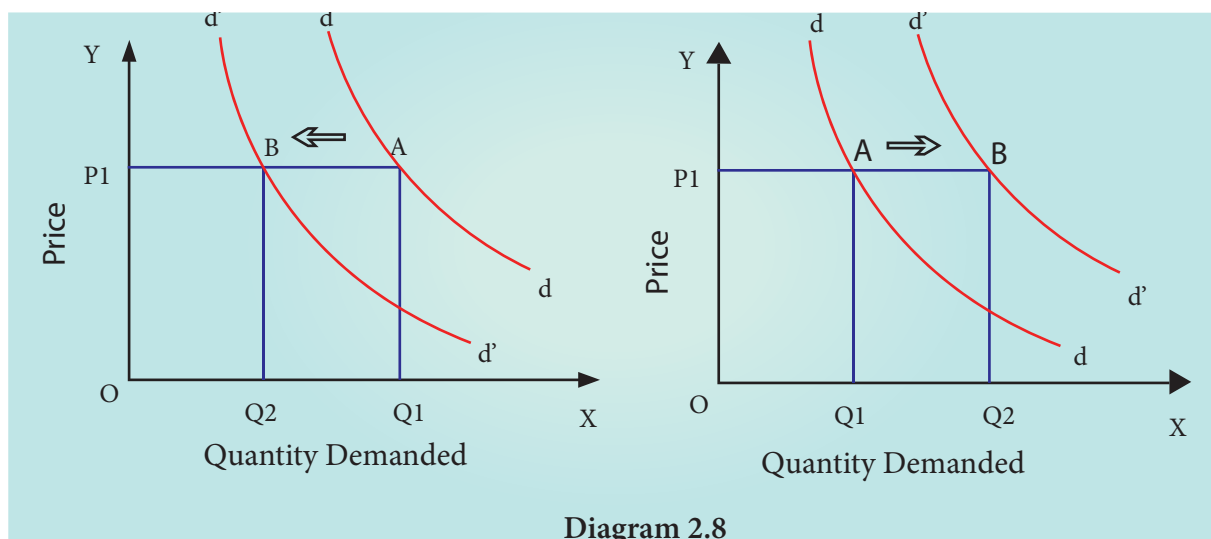
The changes in the quantity demanded for a commodity due to the change in its price alone are called “Extension and

Contraction of Demand”. In other words, buying more at a lower price and less at a higher price is known as “Extension and Contraction of Demand”.

### 2.8.8 Movement along Demand Curve



In the diagram 2.7, at point A, the price  $OP_1$  and quantity demanded is  $OQ_1$ . When price falls to  $OP_3$  (movement along the demand curve A to C) the quantity demanded increases to  $OQ_3$ . If price rises to  $OP_2$  (movement from A to B) quantity demanded decreases to  $OQ_2$ .



### 2.8.9 Shift in the Demand Curve

A shift in the demand curve occurs with a change in the value of a variable other than its price in the general demand function. An increase or decrease in demand due to changes in conditions of demand is shown by way of shifts in the demand curve.

On the left hand side of the diagram 2.8, the original demand curve is  $d^1d^1$ , the price is  $OP_1$  and the quantity demanded is  $OQ_1$ . Due to change in the conditions of demand (change in income, taste or change in prices of substitutes and /or complements) the quantity demanded decreases from  $OQ_1$  to  $OQ_2$ . This is shown in the demand curve to the left. The new demand curve is  $d^1d^1$ . This is called decrease in demand.

On the right hand side of the diagram 2.8, the original price is  $OP_1$  and the quantity demanded is  $OQ_1$ . Due to changes in other conditions, the quantity purchased has increased to  $OQ_2$ . Thus the demand curve shifts to the right  $d^1d^1$ . This is called increase in demand.

‘Extension’ and ‘Contraction’ of demand follow a change in price. Increases and decreases in demand take place when price remains the same and the other factors bring about demand changes.

## 2.9

### Elasticity of Demand

The Law of Demand explains the direction of change in demand due to change in the price. It fails to explain the rate of change in demand due to a given change in price. Elasticity of demand explains the rate of

change in quantity demanded due to a given change in price.

“Elasticity of demand is, therefore, a technical term used by the Economists to describe the degree of responsiveness of the Quantity demand for a commodity to a change in its price”.

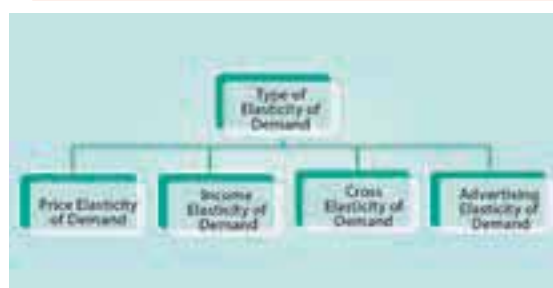
- *Stonier And Hague*

### Elastic demand or More Elastic demand



Demand for a commodity is said to be “Elastic” when the quantity demanded increases by a large amount due to a little fall in the price and decreases by a large amount due a little rise in the price. To be more scientific, Elastic demand is called as “More Elastic Demand”.

### 2.9.1 Types of Elasticity of Demand





## Price Elasticity of Demand

Price elasticity of demand is commonly known as elasticity of demand. This is because price is the most influential factor affecting demand. “Elasticity of demand measures the responsiveness of the quantity demanded to changes in the price”.

- 1. Price Elasticity of Demand:** The price elasticity of demand, commonly known as the elasticity of demand refers to the responsiveness and sensitiveness of demand for a product to the changes in its price. In other words, the price elasticity of demand is equal to

$$E_p = \frac{\text{Proportionate change in Quantity Demanded}}{\text{Proportionate change in Price}}$$

Numerically,

$$E_p = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

where,  $\Delta Q = Q_1 - Q_0$ ,  $\Delta P = P_1 - P_0$ ,  $Q_1$  = New quantity,

$Q_0$  = Original quantity,  $P_1$  = New price,  $P_0$  = Original price.

- 2. Income Elasticity of Demand:** The income is also a factor that influences the demand for a product. Hence, the degree of responsiveness of a change in demand for a product due to the change in the income is known as income elasticity of demand. The formula to compute the income elasticity of demand is:

$$E_y = \frac{\text{Proportionate change in Quantity Demand for a product}}{\text{Proportionate change in Income}}$$

For most of the goods, the income elasticity of demand is greater than one indicating that with the change in income the demand will also change and that too in the same direction, i.e. more income means more demand and vice-versa.

- 3. Cross Elasticity of Demand:** The cross elasticity of demand refers to the percentage change in quantity demanded for one commodity as a result of a small change in the price of another commodity. This type of elasticity usually arises in the case of the interrelated goods such as substitutes and complementary goods. The cross elasticity of demand for goods X and Y can be expressed as:

$$E_c = \frac{\text{Proportion change in demand of Commodity X}}{\text{Proportion change in price of Commodity Y}}$$

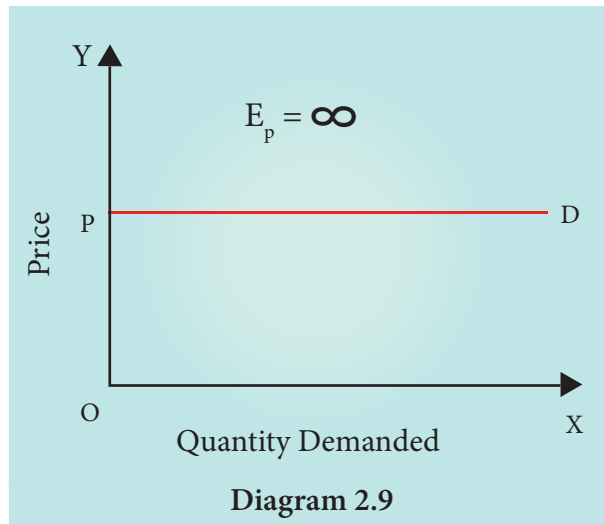
- 4. Advertising Elasticity of Demand:** The responsiveness of the change in demand due to the change in advertising or other promotional expenses, is known as advertising elasticity of demand. It can be expressed as:

$$E_a = \frac{\text{Proportionate change in Demand}}{\text{Proportionate change in Advertising Expenditure}}$$

### 2.9.2 Levels or Degrees of Price Elasticity of Demand

**Definition:** The **Price Elasticity of Demand** is commonly known as the elasticity of demand, which refers to the degree of responsiveness of demand to the change in the price of the commodity.

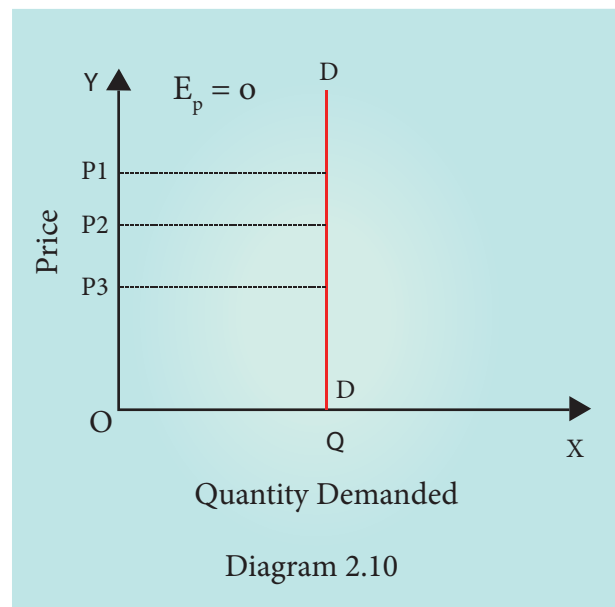
#### 1. Perfectly Elastic Demand ( $E_p = \infty$ ):



The demand is said to be perfectly elastic when a slight change in the price of a commodity causes an infinite change in its quantity demanded. Such as, even a small rise in the price of a commodity can result in greater fall in demand even to zero. In some cases a little fall in the price can result in the increase in demand to infinity. In perfectly elastic demand the demand curve is a **horizontal straight line** parallel to x axis.

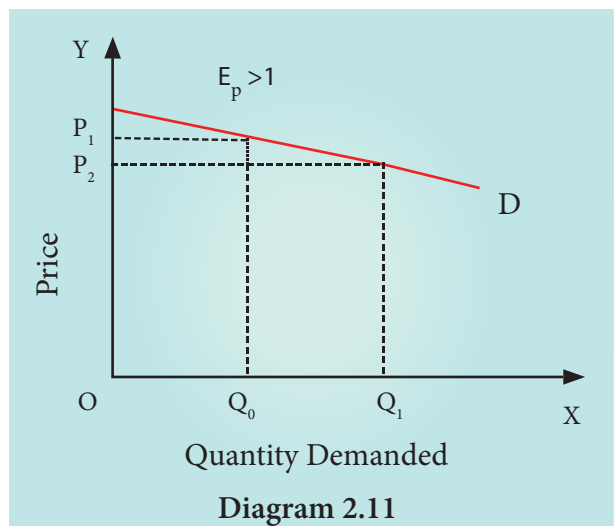
#### 2. Perfectly Inelastic Demand ( $E_p = 0$ ):

When there is no change in the demand for a product due to the change in the price, then the demand is said to be perfectly inelastic. Here, the demand curve is a **vertical straight line** which shows that



the demand remains unchanged irrespective of change in the price., i.e. quantity  $OQ$  remains unchanged at different prices,  $P_1$ ,  $P_2$ , and  $P_3$ .

#### 3. Relatively Elastic Demand ( $E_p > 1$ ):

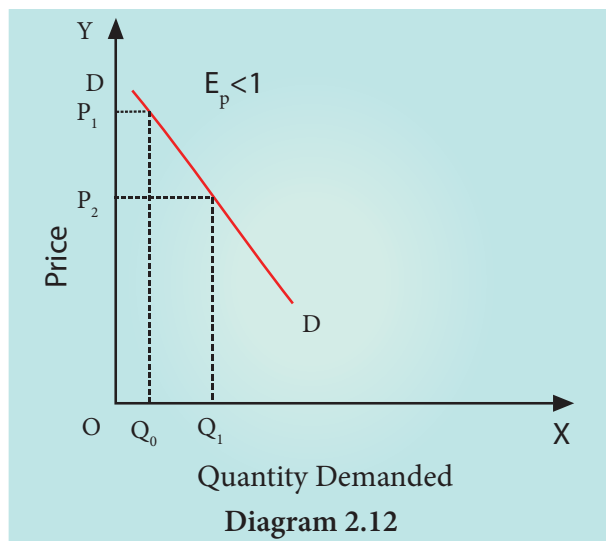


The demand is relatively elastic when the proportionate change in the demand for a commodity is greater than the proportionate change in its price. Here, the demand curve is **gradually sloping** which shows that a proportionate change in quantity from 5 to 10 is greater than the proportionate change in the price

from 11 to 10. Change in demand is:  
 $10 - 5/5 \times 100 = 100\%$

Change in price = 10%. Hence, it is more elastic demand.

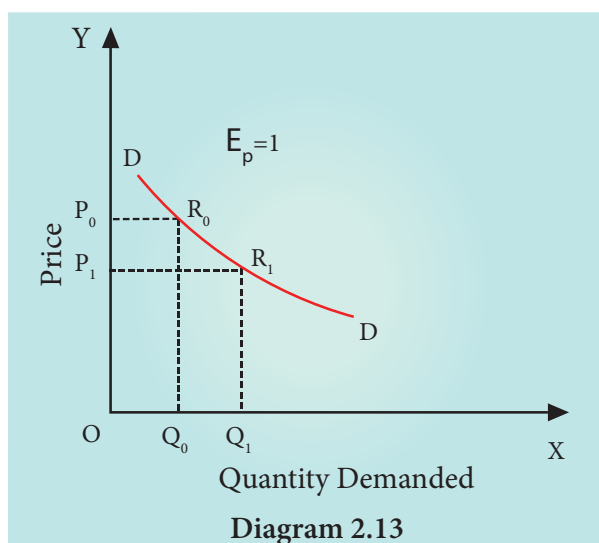
**4. Relatively Inelastic Demand ( $E_p < 1$ ):** When the proportionate change in the demand for a product



is less than the proportionate change in the price, the demand is said to be relatively inelastic. It is also called as the elasticity less than unity. Here the demand curve is **steeply sloping**, which shows that the change in the quantity from  $OQ_0$  to  $OQ_1$  is

relatively smaller than the change in the price from  $OP_1$  to  $OP_2$ .

**5. Unitary Elastic Demand ( $E_p = 1$ ):** The demand is unitary



elastic when the proportionate change in the price of a product results in the same proportionate change in the quantity demanded. Here the shape of the demand curve is a **rectangular hyperbola**, which shows that area under the curve is equal to one.

Here  $OP_0 R_0 Q_0 = OP_1 R_1 Q_1$

**Table 2.5 Degrees of Price Elasticity of Demand**

<i>Numerical Value</i>	<i>Terminology</i>	<i>Description</i>	<i>Shape of the Demand curve</i>
$e_p = \infty$	Perfectly elastic	Change in demand is infinite at a given price	Horizontal
$e_p = 0$	Perfectly inelastic	Demand remains unchanged whatever be the change in price	Vertical
$e_p = 1$	Unitary elastic	$\% \Delta Q = \% \Delta P$	Rectangular Hyperbola
$0 < e_p < 1$	Inelastic	$\% \Delta Q < \% \Delta P$	Steeper
$\infty > e_p > 1$	Elastic	$\% \Delta Q > \% \Delta P$	Flatter



### 2.9.3. Determinants of Elasticity of Demand

There are many factors that determine the degree of price elasticity of demand. Some of them are described below:

**a) Availability of Substitutes:**

If close substitutes are available for a product, then the demand for that product tends to be very elastic. If the price of that product increases, buyers will buy its substitutes; hence fall in its demand will be very large. Hence, price elasticity will be larger. Eg. Vegetables.

For salt no close substitutes are available. Hence even if price of salt increases the fall in demand may be zero or less. Hence salt is price inelastic.

**b) Proportion of consumer's income spent' if smaller proportion of consumer's income is spent on particular commodity say X, price elasticity of demand for X will be smaller. Take for example salt, people spend very small proportion of their income on salt. Hence, salt will have small elasticity of demand, or inelastic.**

**c) Number of uses of commodity:**

If a commodity is used for greater number of uses, its price elasticity will also be larger. For example, milk is used as butter milk, curd, ghee and for making ice cream etc. Hence, even the small fall in the price of milk, will tempt the consumers to use more milk for many purposes. Hence milk has greater price elasticity of demand.

**d) Complementarity between goods:**

For example, along with petrol, lubricating oil is also used for running automobiles.

Here, a rise in the price of lubricating oil may not reduce the demand for lubricating oil. Hence, the complementary good, here, lubricating oil, will be price inelastic.

**e) Time:** In the long run, the price elasticity of demand for many goods will be larger. This is so because, in the long run many substitutes can be discovered or invented. Therefore, the demand is generally more elastic in the long run, than in the short run. In the short run bringing out new substitutes is difficult.

### 2.9.4 Measurement of Elasticity of Demand

There are three methods of measuring price elasticity of demand.

**1. The Percentage Method**

$$e_p = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$$

It is also known as ratio method, when we measure the ratio as:

$$e_p = \frac{\% \Delta Q}{\% \Delta P} \text{ where,}$$

$\% \Delta Q$  = percentage change in demand

$\% \Delta P$  = Percentage change in price

**2. Total Outlay Method**

Marshall suggested that the simplest way to decide whether demand is elastic or inelastic is to examine the change in total outlay of the consumer or total revenue of the firm.

Total Revenue = ( Price x Quantity Sold)

TR = (P x Q)

**Table 2.6 Total Outlay Method**

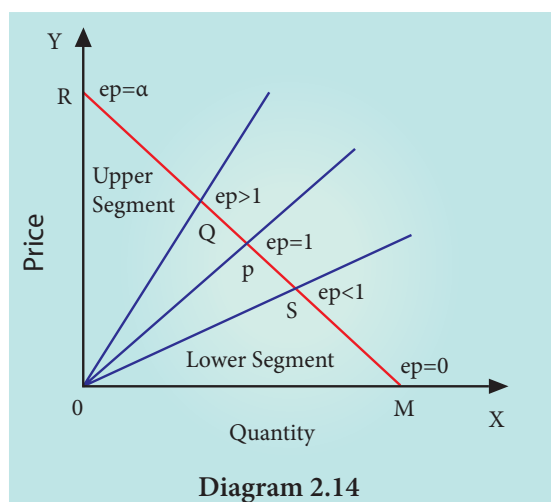
Price	Quantity Demanded	Total Outlay	Elasticity
150	3	450	$e > 1$
125	4	500	
100	5	500	$e = 1$
75	6	450	

Where there is inverse relation between Price and Total Outlay, demand is elastic. Direct relation means inelastic. Elasticity is unity when Total Outlay is constant.

### 3. Point or Geometrical Elasticity

When the demand curve is a straight line, it is said to be linear. Graphically, the point elasticity of a linear demand curve is shown by the ratio of the segments of the line to the right and to the left of the particular point.

$$\text{Point Elasticity} = \frac{\text{Lower segment of the demand curve below the given point}}{\text{Upper segment of the demand curve above the given point}}$$



$$e_p = \frac{L}{U}$$

Where 'e<sub>p</sub>' stands for point elasticity, 'L' stands for the lower segment and 'U' for the upper segment.

### 2.9.5 Importance of Elasticity of Demand

The concept of elasticity of demand is of much practical importance.

- 1. Price fixation:** Each seller under monopoly and imperfect competition has to take into account elasticity of demand while fixing the price for his product. If the demand for the product is inelastic, he can fix a higher price.
- 2. Production:** Producers generally decide their production level on the basis of demand for the product.
- 3. Distribution:** Elasticity of demand also helps in the determination of rewards for factors of production.
- 4. International trade:** Elasticity of demand helps in finding out the terms of trade between two countries. Terms of trade depends upon the elasticity of demand for the goods of the two countries.
- 5. Public finance:** Elasticity of demand helps the government in formulating tax policies. For example, for imposing tax on a commodity.
- 6. Nationalization:** The concept of elasticity of demand enables the government to decide over nationalization of industries.