

## UNIT - II

### ELASTICITY OF DEMAND

Elasticity of demand explains the relationship between a change in price and consequent change in amount demanded. “Marshall” introduced the concept of elasticity of demand. Elasticity of demand shows the extent of change in quantity demanded to a change in price. In the words of “Marshall”, “The elasticity of demand in a market is great or small according as the amount demanded increases much or little for a given fall in the price and diminishes much or little for a given rise in Price”

**Elastic demand:** A small change in price may lead to a great change in quantity demanded.

**In-elastic demand:** If a big change in price is followed by a small change in demanded

#### Types of Elasticity of Demand:

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

#### 1. Price elasticity of demand: (always negative)

Marshall was the first economist to define price elasticity of demand. Price elasticity of demand measures changes in quantity demand to a change in Price. It is the ratio of percentage change in quantity demanded to a percentage change in price.

$$E_p = \frac{\text{Proportionate change in the quantity demand of commodity X}}{\text{Proportionate change in the price of the commodity X}}$$

(or)

$$E_p = \frac{\frac{(Q_2 - Q_1)}{Q_1}}{\frac{(P_2 - P_1)}{P_1}}$$

Q1=Quantity before price change

Q2=Quantity after price change

P1=Price before change

P2=Price after change

Price elasticity impact on demand can be shown under three situations:

- **Ed>1** (elasticity) i.e. percentage change in quantity is greater than percentage change in price in other words revenue increases with every fall in price.
- **Ed=1** (unity) i.e. percentage change in quantity demanded is equal to percentage change in price in other words revenue remains unchanged.
- **Ed<1** (inelastic) i.e. percentage change in quantity is less than percentage change in price in other words revenue decreases with every price is lowered.

#### 2. Income elasticity of demand: (always positive)

Income elasticity of demand shows the change in quantity demanded as a result of a change in income. Income elasticity of demand may be slated in the form of a formula.

$$E_i = \frac{\text{Proportionate change in the quantity demand of commodity X}}{\text{Proportionate change in the income}}$$

(or)

$$E_i = \frac{\frac{(Q_2 - Q_1)}{Q_1}}{\frac{(I_2 - I_1)}{I_1}}$$

Positive income elasticity indicates that the demand for the product rises more quickly than the rise in disposable income.

Income elasticity impact on demand can be shown under three situations:

- **IE > 1** i.e. it is positive in the case of superior goods (A superior good is a good/service that you are more likely to purchase as your expendable income increases. A superior good is a good/service that you are more likely to purchase as your expendable income increases. Ex. Automobiles, refrigerators etc.)
- **IE < 1 or = 1** i.e. in the case of normal goods (Normal goods are any goods for which demand increases when incomes go up, and for which demand decreases when incomes go down. Ex basic necessities)
- **IE is negative** in case of inferior goods (An inferior good is a good/service that you may purchase in substitute of a superior good when your expendable income is limited. Ex used car, generic cereal, second hand products etc.)

### 3. Cross elasticity of Demand:

A change in the price of one commodity leads to a change in the quantity demanded of another commodity. This is called a cross elasticity of demand. The formula for cross elasticity of demand is:

$$E_c = \frac{\text{Proportionate change in the quantity demand of commodity X}}{\text{Proportionate change in the price of product Y}}$$

(or)

$$E_c = \frac{\frac{(Q_2 - Q_1)}{Q_1}}{\frac{(P_2 Y - P_1 Y)}{P_1 Y}}$$

- **CE is always positive in the case of substitutes** (A product or service that satisfies the need of a consumer that another product or service fulfils. A substitute can be perfect or imperfect depending on whether the substitute completely or partially satisfies the consumer. Ex Coffee and Tea When the price of coffee increases, Quantity demanded of tea increases, pepsi and coke, margarine and butter etc.)
- **CE is always negative in the case of complements** (A good or service that is used in conjunction with another good or service. Usually, the complementary good has little to no value when consumed alone but, when combined with another good or service, it adds to the overall value of the offering. Also, good tends to have more value when paired with a complement than it does by itself. Ex paint and paint brushes, soup and

crackers, car and fuel, pen and ink, toothbrush and toothpaste, hair and hair brush, shampoo and conditioner, paper and pencil, computer and internet etc)

#### 4. Advertising elasticity of demand:

It refers to increase in the sales revenue because of change in the advertising expenditure. A measure of a market's sensitivity to increases or decreases in advertising saturation. Advertising elasticity is a measure of an advertising campaign's effectiveness in generating new sales. It is calculated by dividing the percentage change in the quantity demanded by the percentage change in advertising expenditures. A positive advertising elasticity indicates that an increase in advertising leads to an increase in demand for the advertised good or service. The degree to which demand for a good or service will vary with its price. Typically, sales go up with a drop in price and sales go down when prices rise. As a general rule, non-essential items show elasticity of demand and most necessary items such as food and basic clothing will show an inelasticity of demand, meaning that they do not sell significantly more or less with changes in price. There is a direct relationship between the amount of money spent on advertising and its impact on sales.

$$E_a = \frac{\text{Proportionate change in the quantity demand of commodity X}}{\text{Proportionate change in the advertisng costs}}$$

(or)

$$E_a = \frac{\frac{(Q_2 - Q_1)}{Q_1}}{\frac{(A_2 - A_1)}{A_1}}$$

The advertng elasticity is said to be high when a small percentage change in the advertising expenditure results in a large percentage of change in the level of quantity demanded or sales.

#### IMPORTANCE OF ELASTICITY OF DEMAND:

- ✓ **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.
- ✓ **Production:** Producers generally decide their production level on the basis of demand for the product. Hence elasticity of demand helps the producers to take correct decision regarding the level of cut put to be produced.
- ✓ **Distribution:** Elasticity of demand also helps in the determination of rewards for factors of production. For example, if the demand for labour is inelastic, trade unions will be successful in raising wages. It is applicable to other factors of production.
- ✓ **International Trade:** Elasticity of demand helps in finding out the terms of trade between two countries. Terms of trade refers to the rate at which domestic commodity is exchanged for foreign commodities. Terms of trade depends upon the elasticity of demand of the two countries for each other goods.
- ✓ **Public Finance:** Elasticity of demand helps the government in formulating tax policies. For example, for imposing tax on a commodity, the Finance Minister has to take into account the elasticity of demand.
- ✓ **Nationalization:** The concept of elasticity of demand enables the government to decide about nationalization of industries.

## **FACTORS INFLUENCING ELASTICITY OF DEMAND**

### **1. Nature of commodity:**

Elasticity or in-elasticity of demand depends on the nature of the commodity i.e. whether a commodity is a necessity, comfort or luxury, normally; the demand for Necessaries like salt, rice etc is inelastic. On the other hand, the demand for comforts and luxuries is elastic.

### **2. Availability of substitutes:**

Elasticity of demand depends on availability or non-availability of substitutes. In case of commodities, which have substitutes, demand is elastic, but in case of commodities, which have no substitutes, demand is inelastic.

### **3. Variety of uses:**

If a commodity can be used for several purposes, then it will have elastic demand. i.e. electricity. On the other hand, demand is inelastic for commodities, which can be put to only one use.

### **4. Postponement of demand:**

If the consumption of a commodity can be postponed, then it will have elastic demand. On the contrary, if the demand for a commodity cannot be postponed, then demand is inelastic. The demand for rice or medicine cannot be postponed, while the demand for Cycle or umbrella can be postponed.

### **5. Amount of money spent:**

Elasticity of demand depends on the amount of money spent on the commodity. If the consumer spends a smaller amount for example a consumer spends a little amount on salt and matchboxes. Even when price of salt or matchbox goes up, demand will not fall. Therefore, demand is inelastic in case of clothing a consumer spends a large proportion of his income and an increase in price will reduce his demand for clothing. So the demand is elastic.

### **6. Time:**

Elasticity of demand varies with time. Generally, demand is inelastic during short period and elastic during the long period. Demand is inelastic during short period because the consumers do not have enough time to know about the change in price. Even if they are aware of the price change, they may not immediately switch over to a new commodity, as they are accustomed to the old commodity.

### **7. Range of Prices:**

Range of prices exerts an important influence on elasticity of demand. At a very high price, demand is inelastic because a slight fall in price will not induce the people to buy more. Similarly at a low price also demand is inelastic. This is because at a low price all those who want to buy the commodity would have bought it and a further fall in price will not increase the demand. Therefore, elasticity is low at very high and very low prices.

## MEASUREMENT OF ELASTICITY OF DEMAND

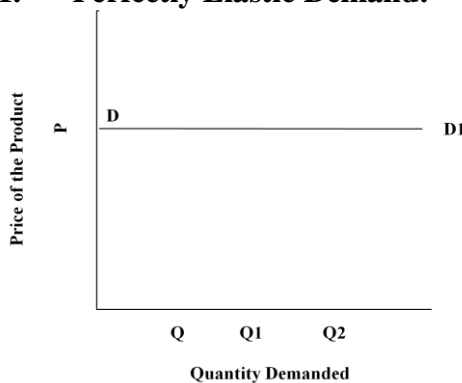
It is defined as the rate of responsiveness in the demand of a commodity for a given change in price or any other determinant of demand.

### Measurement of elasticity of demand:

There are five measurements which postulate the information relating to the price and their effect on demand.

1. Perfectly elastic demand
2. Perfectly inelastic demand
3. Relatively elastic demand
4. Relatively inelastic demand
5. Unit elastic demand

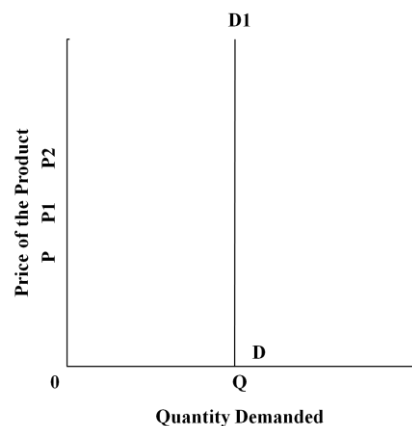
#### 1. Perfectly Elastic Demand:



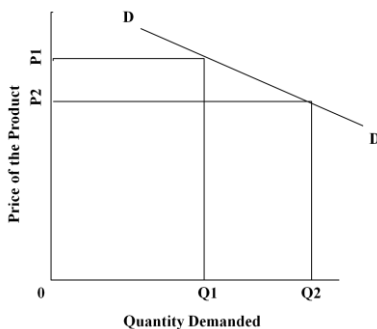
When small change in price leads to an infinitely large change in quantity demanded, it is called perfectly or infinitely elastic demand. In this case  $E = \infty$  the demand curve  $DD1$  is horizontal straight line. It shows that at "OP" price any amount is demanded and if price increases, the consumer will not purchase the commodity. Even a small increase in price will lead to a complete fall in demand.

#### 2. Perfectly Inelastic Demand:

In this case, even a large change in price fails to bring about a change in quantity demanded. When price increases from 'OP' to 'OP', the quantity demanded remains the same. In other words, the response of demand to a change in price is nil. In this case ' $E$ '=0. When there is no change in the quantity demanded even though there is a big change in price i.e. increase or decrease.

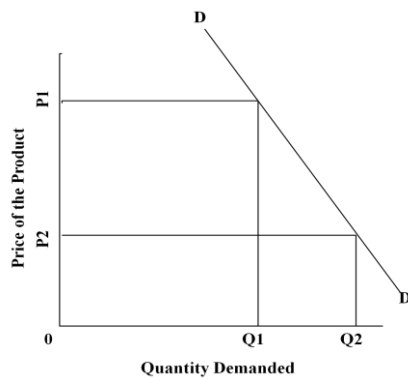


#### 3. Relatively Elastic Demand:



Demand changes more than proportionately to a change in price i.e. a small change in price leads to a very big change in the quantity demanded. In this case  $E > 1$  this demand curve will be flatter. When price falls from 'OP1' to 'OP2', the amount demanded increases from "OQ1" to "OQ2" which is larger than the change in price.

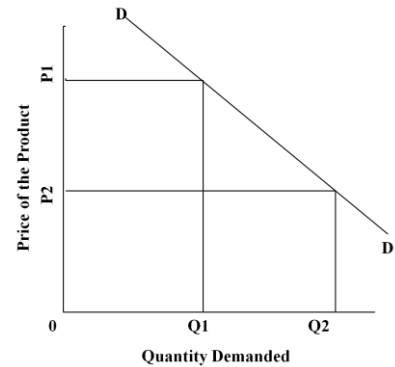
#### 4. Relatively Inelastic Demand:



Quantity demanded changes less than proportional to a change in price. A large change in price leads to small change in amount demanded. Here  $E < 1$ . Demanded curve will be steeper. When price falls from “OP” to ‘OP1’ amount demanded increases from OQ to OQ1, which is smaller than the change in price.

#### 5. Unity Elasticity Demand:

The change in demand is exactly equal to the change in price. When both are equal  $E=1$  and elasticity is said to be unitary. When price falls from ‘OP’ to ‘OP1’ quantity demanded increases from ‘OQ’ to ‘OQ1’. Thus a change in price has resulted in an equal change in quantity demanded so price elasticity of demand is equal to unity.



## **DEMAND FORECASTING**

### **Introduction:**

The information about the future is essential for both new firms and those planning to expand the scale of their production. Demand forecasting refers to an estimate of future demand for the product. It is an 'objective assessment of the future course of demand'. In recent times, forecasting plays an important role in business decision-making. Demand forecasting has an important influence on production planning. It is essential for a firm to produce the required quantities at the right time. It is essential to distinguish between forecasts of demand and forecasts of sales. Sales forecast is important for estimating revenue cash requirements and expenses. Demand forecasts relate to production, inventory control, timing, reliability of forecast etc. However, there is not much difference between these two terms.

### **Methods of forecasting:**

Several methods are employed for forecasting demand. All these methods can be grouped under survey method and statistical method. Survey methods and statistical methods are further subdivided in to different categories.

#### **1. Survey Method:**

Under this method, information about the desires of the consumer and opinion of experts are collected by interviewing them. Survey method can be divided into four types viz., Opinion survey method; expert opinion; Delphi method and consumers interview methods.

##### **A. Opinion survey method:**

This method is also known as sales-force composite method (or) collective opinion method. Under this method, the company asks its salesman to submit estimate of future sales in their respective territories. Since the forecasts of the salesmen are biased due to their optimistic or pessimistic attitude ignorance about economic developments etc. these estimates are consolidated, reviewed and adjusted by the top executives. In case of wide differences, an average is struck to make the forecasts realistic. This method is more useful and appropriate because the salesmen are more knowledgeable. They can be an important source of information. They are cooperative. The implementation within unbiased or their bias can be corrected.

##### **B. Expert opinion method:**

Apart from salesmen and consumers, distributors or outside experts may also be used for forecasting. In the United States of America, the automobile companies get sales estimates directly from their dealers. Firms in advanced countries make use of outside experts for estimating future demand. Various public and private agencies all periodic forecasts of short or long term business conditions.

##### **C. Delphi Method:**

A variant of the survey method is Delphi method. It is a sophisticated method to arrive at a consensus. Under this method, a panel is selected to give suggestions to solve the problems in hand. Both internal and external experts can be the members of the panel. Panel members are kept apart from each other and express their views in an anonymous manner. There is also a coordinator who acts as an intermediary among the panelists. He prepares the questionnaire and sends it to the panelist. At the end of each round, he prepares a summary report. On the basis of the summary report the panel members have to give suggestions. This method has been used in the area of technological forecasting. It has proved more popular in forecasting. It has proved more popular in forecasting non-economic rather than economic variables.

##### **D. Consumers interview method:**

In this method the consumers are contacted personally to know about their plans and preference regarding the consumption of the product. A list of all potential buyers would

be drawn and each buyer will be approached and asked how much he plans to buy the listed product in future. He would be asked the proportion in which he intends to buy. This method seems to be the most ideal method for forecasting demand.

## **2. Statistical Methods:**

Statistical method is used for long run forecasting. In this method, statistical and mathematical techniques are used to forecast demand. This method relies on past data.

### **A. Time series analysis or trend projection methods:**

A well-established firm would have accumulated data. These data are analyzed to determine the nature of existing trend. Then, this trend is projected into the future and the results are used as the basis for forecast. This is called as time series analysis. This data can be presented either in a tabular form or a graph. In the time series past data of sales are used to forecast future.

### **B. Barometric Technique:**

Simple trend projections are not capable of forecasting turning points. Under Barometric method, present events are used to predict the directions of change in future. This is done with the help of economics and statistical indicators.

Those are

- (1) Construction Contracts awarded for building materials
- (2) Personal income
- (3) Agricultural Income.
- (4) Employment
- (5) Gross national income
- (6) Industrial Production
- (7) Bank Deposits etc.

### **C. Regression and correlation method:**

Regression and correlation are used for forecasting demand. Based on past data the future data trend is forecasted. If the functional relationship is analyzed with the independent variable it is simple correlation. When there are several independent variables it is multiple correlation. In correlation we analyze the nature of relation between the variables while in regression; the extent of relation between the variables is analyzed. The results are expressed in mathematical form. Therefore, it is called as econometric model building. The main advantage of this method is that it provides the values of the independent variables from within the model itself.