

Table 5 below summarizes the relationship between price elasticity and total revenue.

Table 5: The Relationship between Price elasticity and Total Revenue (TR)

Demand			
	Elastic	Unitary Elastic	Inelastic
Price increase	TR Decreases	TR remains same	TR Increases
Price decrease	TR Increases	TR remains same	TR Decreases

1.5.8 Determinants of Price Elasticity of Demand

Factors

In the above section we have explained what price elasticity is and how it is measured. Now an important question is What are the factors which determine whether the demand for a good is elastic or inelastic? We will consider the following important determinants of price elasticity.

- (1) **Availability of substitutes:** One of the most important determinants of elasticity is the degree of substitutability and the extent of availability of substitutes. Some commodities like butter, cabbage, car, oil, drink etc. have close substitutes. These are margarine, other green vegetables, other brands of cars, other brands of cold drinks respectively. A change in the price of these commodities, the prices of the substitutes remaining constant, can be expected to cause quite substantial substitution – a fall in price leading consumers to buy more of the commodity in question and a rise in price leading consumers to buy more of the substitutes.

Commodities such as salt, housing, and all vegetables taken together, have few, if any, satisfactory substitutes and a rise in their prices may cause a smaller fall in their quantity demanded. Thus, we can say that goods which typically have close or perfect substitutes have highly elastic demand curves. Moreover, wider the range of substitutes available, the greater will be the elasticity. For example, toilet soaps, toothpastes etc have wide variety of brands and each brand is a close substitute for the other.

It should be noted that while as a group, a good or service may have inelastic demand, but when we consider its various brands, we say that a particular brand has elastic demand. Thus, while the demand for a generic good like petrol is inelastic, the demand for Indian Oil's petrol is elastic. Similarly, while there are no general substitutes for health care, there are substitutes for one doctor or hospital. Likewise, the demand for common salt and sugar is inelastic because good substitutes are not available for these.

- (2) **Position of a commodity in the consumer's budget:** The greater the proportion of income spent on a commodity; generally the greater will be its elasticity of demand and vice-versa. The demand for goods like common salt, matches, buttons, etc. tend to be highly inelastic because a household spends only a fraction of their income on each of them. On the other hand, demand for goods like rental apartments and clothing tends to be elastic since households generally spend a good part of their income on them. When the good absorbs a significant share of consumers' income, it is worth their time and effort to find a way to reduce their demand when the price goes up.

- (3) **Nature of the need that a commodity satisfies:** In general, luxury goods are price elastic because one can easily live without a luxury. In contrast, necessities are price inelastic. Thus, while the demand for a home theatre is relatively elastic, the demand for food and housing, in general, is inelastic. If it is possible to

postpone the consumption of a particular good, such good will have elastic demand. Consumption of necessary goods cannot be postponed and therefore, their demand is inelastic.

Number of uses to which a commodity can be put: The more the possible uses of a commodity, the greater will be its price elasticity and vice versa. When the price of a commodity which has multiple uses decreases, people tend to extend their consumption to its other uses. To illustrate, milk has several uses. If its price falls, it can be used for a variety of purposes like preparation of curd, cream, ghee and sweets. But, if its price increases, its use will be restricted only to essential purposes like feeding the children and sick persons.

Time period: The longer the time-period one has, the more completely one can adjust. Time gives buyers the opportunity to find alternatives or substitutes, or change their habits. A simple example of the effect can be seen in motoring habits. In response to a higher petrol price, one can, in the short run, make fewer trips by car. In the longer run, not only can one make fewer trips, but he can purchase a car with a smaller engine capacity when the time comes for replacing the existing one. Hence one's demand for petrol falls by more when one has made long term adjustments to higher prices.

Consumer habits: If a person is a habitual consumer of a commodity, no matter how much its price changes, the demand for the commodity will be inelastic. If buyers have rigid preferences demand will be less price elastic. Habitual \rightarrow inelastic

Tied demand: The demand for those goods which are tied to others is normally inelastic as against those whose demand is of autonomous nature. For example printers and ink cartridges.

Price range: Goods which are in very high price range or in very low price range have inelastic demand, but those in the middle range have elastic demand. (Only Elastic Chappal)

Minor complementary items: The demand for cheap, complementary items to be used together with a costlier product will tend to have an inelastic demand. match Box

Knowledge of the price elasticity of demand and the factors that may change it is of key importance to business managers because it helps them recognise the effect of a price change on their total sales and revenues. Firms aim to maximise their profits and their pricing strategy is highly decisive in attaining their goals. Knowledge of the price elasticity of demand for the goods they sell helps them in arriving at an optimal pricing strategy.

If the demand for a firm's product is relatively elastic, the managers need to recognize that lowering the price would expand the volume of sales and result in an increase in total revenue. On the contrary, when the demand is elastic, they have to be very cautious about increasing prices because a price increase will lead to a decline in total revenue as fall in sales would be more than proportionate. If the firm finds that the demand for their product is relatively inelastic, the firm may safely increase the price and thereby increase its total revenue as they can be assured of the fact that the fall in sales on account of a price rise would be less than proportionate.

Knowledge of price elasticity of demand is important for governments while determining the prices of goods and services provided by them, such as, transport and telecommunication. Further, it also helps the governments to understand the nature of responsiveness of demand to increase in prices on account of additional taxes and the implications of such responses on the tax revenues. Elasticity of demand explains

Why the governments are inclined to raise the indirect taxes on those goods that have a relatively inelastic demand, such as alcohol and tobacco products?

1.6 Income Elasticity of Demand

The income elasticity of demand is a measure of how much the demand for a good is affected by changes in consumers' incomes. Estimates of income elasticity of demand are useful for businesses to predict the possible growth in sales as the average incomes of consumers grow over time. Income elasticity of demand is the degree of responsiveness of the quantity demanded of a good to changes in the income of consumers. In symbolic form:

$$E_I = \frac{\text{Percentage change in demand}}{\text{Percentage change in income}}$$

This can be given mathematically as follows:

$$\begin{aligned} E_I &= \frac{\Delta Q}{Q} + \frac{\Delta Y}{Y} \\ &= \frac{\Delta Q}{Q} \times \frac{Y}{\Delta Y} \\ E_I &= \frac{\Delta Q}{\Delta Y} \times \frac{Y}{Q} \end{aligned}$$

↗
RHS ↘

E_I = Income elasticity of demand

ΔQ = Change in demand

Q = Original demand

Y = Original money income

ΔY = Change in money income

There is a useful relationship between income elasticity for a good and the proportion of income spent on it. The relationship between the two is described in the following three propositions:

1. If the proportion of income spent on a good remains the same as income increases, then income elasticity for that good is equal to one.
2. If the proportion of income spent on a good increase as income increases, then the income elasticity for that good is greater than one. The demand for such goods increase faster than the rate of increase in income.
3. If the proportion of income spent on a good decrease as income rises, then income elasticity for the good is positive but less than one. The demand for income-inelastic goods rises, but substantially slowly compared to the rate of increase in income. Necessities such as food and medicines tend to be income-inelastic.

Income elasticity of goods reveals a few very important features of demand for the goods in question.

If income elasticity is zero, it signifies that the demand for the good is quite unresponsive to changes in income. When income elasticity is greater than zero or positive, then an increase in income leads to an increase in the demand for the good. This happens in the case of most of the goods and such goods are called normal goods. For

all normal goods, income elasticity is positive. However, the degree of elasticity varies according to the nature of commodities.

When the income elasticity of demand is negative, the good is an inferior good. In this case, the quantity demanded at any given price decreases as income increases. The reason is that when income increases, consumers choose to consume superior substitutes.

Another significant value of income elasticity is that of unity. When income elasticity of demand is equal to one, the proportion of income spent on goods remains the same as consumer's income increases. This represents a useful dividing line. If the income elasticity for a good is greater than one, it shows that the good bulks larger in consumer's expenditure as he becomes richer. Such goods are called luxury goods. On the other hand, if the income elasticity is less than one, it shows that the good is either relatively less important in the consumer's eye or, it is a good which is a necessity.

The following examples will make the above concepts clear:

- (a) The income of a household rises by 10%, the demand for wheat rises by 5%.
- (b) The income of a household rises by 10%, the demand for T.V. rises by 20%.
- (c) The incomes of a household rises by 5%, the demand for bajra falls by 2%.
- (d) The income of a household rises by 7%, the demand for commodity X rises by 7%.
- (e) The income of a household rises by 5%, the demand for buttons does not change at all.

Using formula for income elasticity,

$$\text{i.e. } E_I = \frac{\text{Percentage change in demand}}{\text{Percentage change in income}}$$

We will find income-elasticity for various goods. The results are as follows:

S. No.	Commodity	Income-elasticity for the household	Remarks
a	Wheat	$\frac{5\%}{10\%} = .5(E_I < 1)$	Since $0 < .5 < 1$, wheat is a normal good and fulfils a necessity.
b	T.V.	$\frac{20\%}{10\%} = 2(E_I > 1)$	Since $2 > 1$, T.V. is a luxurious commodity.
c	Bajra	$\frac{(-2\%)}{5\%} = (-).4(E_I < 0)$	Since $-4 < 0$, Bajra is an inferior commodity in the eyes of the household.
d	X	$\frac{7\%}{7\%} = 1(E_I = 1)$	Since income elasticity is 1, X has unitary income elasticity.
e	Buttons	$\frac{0\%}{5\%} = 0(E_I = 0)$	Buttons have zero income-elasticity.

It is to be noted that the words 'luxury', 'necessity', 'inferior good' do not signify the strict dictionary meanings here. In economic theory, we distinguish them in the manner shown above.

An important feature of income elasticity is that income elasticities differ in the short run and long run. For nearly all goods and services the income elasticity of demand is larger in the long run than in the short run.

Knowledge of income elasticity of demand is very useful for a business firm in estimating the future demand for its products. Knowledge of income elasticity of demand helps firms measure the sensitivity of sales for a given product to incomes in the economy and to predict the outcome of a business cycle on its market demand. For instance, if $EY = 1$, sales move exactly in step with changes in income. If $EY > 1$, sales are highly cyclical, that is, sales are sensitive to changes in income. For an inferior good, sales are countercyclical, that is, sales move in the opposite direction of income and $EY < 0$. This knowledge enables the firm to carry out appropriate production planning and management.

ILLUSTRATION 6

Income Elasticity of Demand

A car dealer sells new as well as used cars. Sales during the previous year were as follows:

Car type	Price	Quantity (Nos)
New	6.5 lakhs	400
Used	60,000	4000

During the previous year, other things remaining the same, the real incomes of the customers rose on average by 10%. During the last year sales of new cars increased to 500, but sales of used cars declined to 3,850. What is the income elasticity of demand for the new as well as used cars? What inference do you draw from these measures of income elasticity?

SOLUTION

Income Elasticity of demand for new cars

Percentage change in income = 10%, given

Percentage change in quantity of new cars demanded = $(\Delta Q/Q) \times 100 = (100/400) \times 100 = 25\%$

Income elasticity of demand = $25\% / 10\% = +2.5$

New car is therefore income elastic. Since income elasticity is positive, new car is a normal good.

Income Elasticity of demand for used cars

Percentage change in income = 10%, given

Percentage change in quantity of used cars demanded = $(\Delta Q/Q) \times 100 = (-150/4000) \times 100 = -3.75\%$ Income elasticity

% change in quantity of used cars demanded = $-3.75 / 10 = -0.375$

Since income elasticity is negative, used car is an inferior good.

1.7. CROSS - PRICE ELASTICITY OF DEMAND

1.7.1 Price of Related Goods and Demand

The demand for a particular commodity may change due to changes in the prices of related goods. These related goods may be either complementary goods or substitute goods. This type of relationship is studied under 'Cross Demand'. Cross demand refers to the quantities of a commodity or service which will be purchased with reference to changes in price, not of that particular commodity, but of other inter-related commodities, other things remaining the same. It may be defined as the quantities of a commodity that consumers buy per unit of time, at different prices of a 'related article', 'other things remaining the same'. The assumption 'other things remaining the same' means that the income of the consumer and also the price of the commodity in question will remain constant.

(a) Substitute Products and Demand *Tea & Coffee*

In the case of substitute commodities, the cross demand curve slopes upwards (i.e. positively) showing that more quantities of a commodity, will be demanded whenever there is a rise in the price of a substitute commodity. In figure 10, the quantity demanded of tea is given on the X axis. Y axis represents the price of coffee which is a substitute for tea. When the price of coffee increases, due to the operation of the law of demand, the demand for coffee falls. The consumers will substitute tea in the place of coffee. The price of tea is assumed to be constant. Therefore, whenever there is an increase in the price of one commodity, the demand for the substitute commodity will increase.

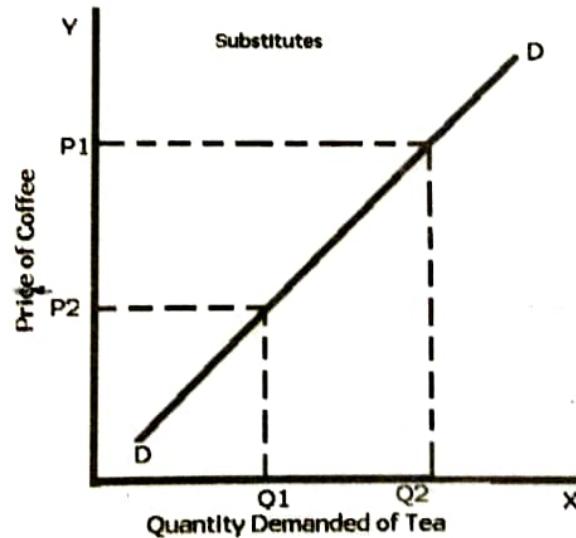


Fig. 10 : Substitutes

(b) Complementary Goods

In the case of complementary goods, as shown in the figure 11 below, a change in the price of a good will have an opposite reaction on the demand for the other commodity which is closely related or complementary. For instance, an increase in demand for solar panels will necessarily increase the demand for batteries. The same is the case with complementary goods such as bread and butter; car and petrol, electricity and electrical gadgets etc. Whenever there is a fall in the demand for solar panels due to a rise in their prices, the demand for batteries will fall, not because the price of batteries has gone up, but because the price of solar panels has gone up. So, we find that there

Petrol & Car

is an inverse relationship between price of a commodity and the demand for its complementary good (other things remaining the same).

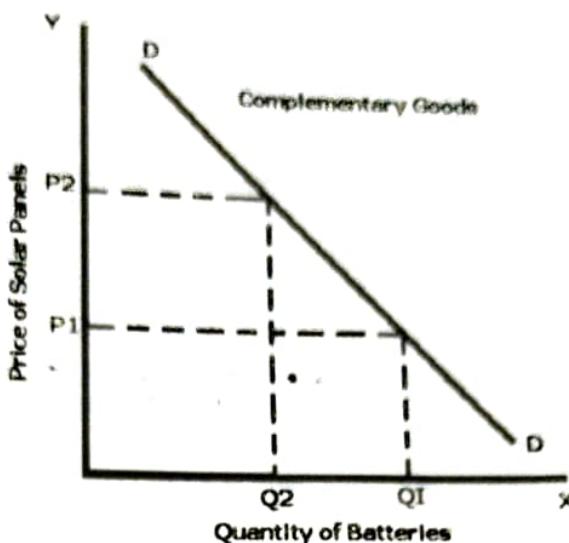


Fig. 11: Complementary Goods

We shall now look into the cross - price elasticity of demand.

The cross-price elasticity of demand between two goods measures the effect of the change in one good's price on the quantity demanded of the other good. Here, we consider the effect of changes in relative prices within a market on the pattern of demand. A change in the demand for one good in response to a change in the price of another good represents cross elasticity of demand of the former good for the latter good. It is equal to the percentage change in the quantity demanded of one good divided by the percentage change in the other good's price.

$$Ec = \frac{\text{Percentage change in quantity demanded of good } X}{\text{Percentage change in price of good } Y}$$

Symbolically, (mathematically)

$$E_c = \frac{\Delta q_x}{q_x} + \frac{\Delta p_y}{p_y}$$

$$E_c = \frac{\Delta q_x}{\Delta p_y} + \frac{p_y}{q_x}$$

Where E_c stands for cross elasticity.

q_x stands for original quantity demanded of X.

Δq_x stands for change in quantity demanded of X

p_y stands for the original price of good Y.

Δp_y stands for a small change in the price of Y.

In the case of the cross-price elasticity of demand, the sign (plus or minus) is very important: it tells us whether the two goods are complements or substitutes.

When two goods X and Y are substitutes, the cross-price elasticity of demand is positive: a rise in the price of Y increases the demand for X and causes a rightward shift of the demand curve. When the cross-price elasticity of demand is positive, its size is a measure of how closely substitutable the two goods are. Greater the cross elasticity, the closer is the substitute. Higher the value of cross elasticity, greater will be the substitutability.

- If two goods are perfect substitutes for each other, the cross elasticity between them is infinite.
- If two goods are close substitutes, the cross-price elasticity will be positive and large.
- If two goods are not close substitutes, the cross-price elasticity will be positive and small.
- If two goods are totally unrelated, the cross-price elasticity between them is zero.

When two goods are complementary (tea and sugar) to each other, the cross elasticity between them is negative so that a rise in the price of one leads to a fall in the quantity demanded of the other causing a leftward shift of the demand curve. The size of the cross-price elasticity of demand between two complements tells us how strongly complementary they are: if the cross-price elasticity is only slightly below zero, they are weak complements; if it is negative and very high, they are strong complements.

However, one need not base the classification of goods on the basis of the above definitions. While the goods between which cross elasticity is positive can be called substitutes, the goods between which cross elasticity is negative are not always complementary. This is because negative cross elasticity is also found when the income effect of the price change is very strong.

The concept of cross elasticity of demand is useful for a manager while making decisions regarding changing the prices of his products which have substitutes and complements. If cross elasticity to change in the price of substitutes is greater than one, the firm may lose by increasing the prices and gain by reducing the prices of his products. With proper knowledge of cross elasticity, the firm can plan policies to safeguard against fluctuating prices of substitutes and complements.

Cross- price elasticity of demand

ILLUSTRATION 7

A shopkeeper sells only two brands of note books Imperial and Royal. It is observed that when the price of Imperial rises by 10% the demand for Royal increases by 15%. What is the cross price elasticity for Royal against the price of Imperial?

SOLUTION

$$Ec = \frac{\text{Percentage change in quantity demanded of good X}}{\text{Percentage change in price of good Y}}$$

$$Ec = \frac{15\%}{10\%} = +1.5$$

The two brands of note book Imperial and Royal are substitutes with significant substitutability

ILLUSTRATION 8

The cross price elasticity between two goods X and Y is known to be - 0.8. If the price of good Y rises by 20%, how will the demand for X change?

SOLUTION

Inserting the values in the formula:

$$-0.8 = X/ 20\%$$

$$\% \text{ change in quantity demanded of } X = 20\% \times -0.8 = -16\%$$

Since cross elasticity is negative, X and Y are complementary goods

ILLUSTRATION 9

The price of 1kg of tea is Rs 30. At this price 5kg of tea is demanded. If the price of coffee rises from Rs 25 to Rs 35 per kg, the quantity demanded of tea rises from 5kg to 8kg. Find out the cross price elasticity of tea.

SOLUTION

$$\text{Cross elasticity} = \frac{\Delta q_x \times p_y}{\Delta p_y \quad q_x} \quad \begin{matrix} x = \text{tea} \\ \text{Here} \\ y = \text{coffee} \end{matrix}$$

$$Ec = \frac{8 - 5}{10} \times \frac{25}{5} = \frac{3}{10} \times \frac{25}{5} = +1.5$$

The elasticity of demand of tea is +1.5 showing that the demand of tea is highly elastic with respect to coffee. The positive sign shows that tea and coffee are substitute goods.

ILLUSTRATION 10

The price of 1 kg of sugar is Rs 50. At this price 10 kg is demanded. If the price of tea falls from Rs 30 to Rs 25 per kg, the consumption of sugar rises from 10 kg to 12 kg. Find out the cross price elasticity and comment on its value.

SOLUTION

$$\text{Cross elasticity} = \frac{\Delta q_x \times p_y}{\Delta p_y \quad q_x} \quad \begin{matrix} x = \text{Sugar} \\ \text{Here} \\ y = \text{Tea} \end{matrix}$$

$$= \frac{2}{-5} \times \frac{30}{10} = (-) 1.2$$

Since the elasticity is -1.2, we can say that sugar and tea are complementary in nature.

**1.8 ADVERTISEMENT ELASTICITY**

Advertisement elasticity of sales or promotional elasticity of demand is the responsiveness of a good's demand to changes in the firm's spending on advertising. The advertising elasticity of demand measures the percentage change in demand that occurs given a one percent change in advertising expenditure. Advertising elasticity measures the effectiveness of an advertisement campaign in bringing about new sales.

Advertising elasticity of demand is typically positive. Higher the value of advertising elasticity greater will be the responsiveness of demand to change in advertisement. Advertisement elasticity varies between zero and infinity. It is measured by using the formula:

$$E_a = \frac{\% \text{ Change in quantity demanded}}{\% \text{ change in spending on advertising}}$$

$$E_a = \frac{\Delta Q_d / Q_d}{\Delta A / A}$$

Where ΔQ_d denotes increase in demand

ΔA denotes additional expenditure on advertisement

Q_d denotes initial demand

A denotes initial expenditure on advertisement

Elasticity	Interpretation
$E_a = 0$	Demand does not respond at all to increase in advertisement expenditure
$E_a > 0$ but < 1	Increase in demand is less than proportionate to the increase in advertisement expenditure
$E_a = 1$	Demand increase in the same proportion in which advertisement expenditure increase
$E_a > 1$	Demand increase at a higher rate than increase in advertisement expenditure

As far as a business firm is concerned, the measure of advertisement elasticity is useful in understanding the effectiveness of advertising and in determining the optimum level of advertisement expenditure.



1.9 DEMAND FORECASTING

1.9.0 Meaning

Forecasting, in general, refers to knowing or measuring the status or nature of an event or variable before it occurs. Forecasting of demand is the art and science of predicting the probable demand for a product or a service at some future date on the basis of certain past behaviour patterns of some related events and the prevailing trends at present. It should be kept in mind that demand forecasting is not simple guessing, but it refers to estimating demand scientifically and objectively on the basis of certain facts and events relevant to forecasting.

1.9.1 Usefulness

The significance of demand or sales forecasting in the context of business policy decisions can hardly be over emphasized. Forecasting of demand plays a vital role in the process of planning and decision-making, whether at the national level or at the level of a firm. The effectiveness of the plans of business managers depends upon the level of accuracy with which future events can be predicted. The importance of demand forecasting has increased all the more on account of mass production and production in response to demand.

A good forecast enables the firm to perform efficient business planning. Forecasts offer information for budgetary planning and cost control in functional areas of finance and accounting. Good forecasts help in efficient production planning, process selection, capacity planning, facility layout and inventory management. A firm can plan production scheduling well in advance and obtain all necessary resources for production such as inputs and finances. Capital investments can be aligned to demand expectations and this will check the possibility of overproduction and underproduction, excess of unused capacity and idle resources. Marketing personnel often rely on sales forecasting in making key decisions. Demand forecasts also provide the necessary information for formulation of suitable pricing and advertisement strategies.

It is said that no forecast is completely fool-proof and correct. However, the very process of forecasting helps in evaluating various forces which affect demand and is in itself a rewarding activity because it enables the forecasting authority to know about various forces relevant to the study of demand behaviour.

1.9.2 Scope of Forecasting

Demand forecasting can be at the national or international level depending upon the area of operation of the given economic institution. It can also be confined to a given product or service supplied by a small firm in a local area. The scope of the forecasting task will depend upon the area of operation of the firm in the present as well as what is proposed in future. Much would depend upon the cost and time involved in relation to the benefit of the information acquired through the study of demand. The necessary trade-off has to be struck between the cost of forecasting and the benefits flowing from such forecasting.

1.9.3 Types of Forecasts

- (i) Macro-level forecasting deals with the general economic environment prevailing in the economy as measured by the Index of Industrial Production (IIP), national income and general level of employment etc.
- (ii) Industry- level forecasting is concerned with the demand for the industry's products as a whole. For example, demand for cement in India.
- (iii) Firm- level forecasting refers to forecasting the demand for a particular firm's product, say, the demand for ACC cement

Based on time period, demand forecasts may be short term demand forecasting and long term demand forecasting.

- (i) Short term demand forecasting covers a short span of time, depending of the nature of industry. It is done usually for six months or less than one year and is generally useful in tactical decisions.
- (ii) Long term forecasts are for longer periods of time, say two to five years and more. It provides information for major strategic decisions of the firm such as expansion of plant capacity.

1.9.4 Demand Distinctions

Business managers should have a clear understanding of the kind of demand which their products have. Before we analyse the different methods of forecasting demand, it is important for us to understand the demand distinctions which are as follows:

- (a) Producer's goods and Consumer's goods
- (b) Durable goods and Non-durable goods
- (c) Derived demand and Autonomous demand
- (d) Industry demand and Company demand
- (e) Short-run demand and Long-run demand

(a) Producer's goods and Consumer's goods

Producer's goods are those which are used for the production of other goods- either consumer goods or producer goods themselves. Examples of such goods are machines, plant and equipments. Consumer's goods are those which are used for final consumption. Examples of consumer's goods are readymade clothes, prepared food, residential houses, etc.

(b) Demand for Durable goods and Non-durable goods

Goods may be further sub-divided into durable and non-durable goods. Non durable goods are those which cannot be consumed more than once. Raw materials, fuel and power, packing items etc are examples of non durable producer goods. Beverages, bread, milk etc are examples of non-durable consumer goods. These will meet only the current demand. On the other hand, durable goods do not quickly wear out, can be consumed more than once and yield utility over a period of time. Examples of durable consumer goods are: cars, refrigerators and mobile phones. Building, plant and machinery, office furniture etc are durable producer goods. The demand for durable goods is likely to be derived demand. Further, there are semi-durable goods such as, clothes and umbrella.

(c) Derived demand and Autonomous demand

The demand for a commodity that arises because of the demand for some other commodity called 'parent product', is called derived demand. For example, the demand for cement is derived demand, being directly related to building activity. In general, the demand for producer goods or industrial inputs is derived demand. Also the demand for complementary goods is derived demand. If the demand for a product is independent of the demand for other goods, then it is called autonomous demand. It arises on its own out of an innate desire of the consumer to consume or to possess the commodity. But this distinction is purely arbitrary and it is very difficult to find out which product is entirely independent of other products.

(d) Demand for firm's product and industry demand

The term industry demand is used to denote the total demand for the products of a particular industry, e.g. the total demand for steel in the country. On the other hand, the demand for firm's product denotes the demand for the products of a particular firm, i.e. the quantity that a firm can dispose off at a given price over a period of time. E.g. demand for steel produced by the Tata Iron and Steel Company. The demand for a firm's product when expressed as a percentage of industry demand signifies the market share of the firm.

(e) Short - run demand and Long-run demand

This distinction is based on time period. Short run demand refers to demand with its immediate reaction to changes in product price and prices of related commodities, income fluctuations, ability of the consumer to adjust their consumption pattern, their susceptibility to advertisement of new products etc.

Long-run demand refers to demand which exists over a long period. Most generic goods have long term demand. Long term demand depends on long term income trends, availability of substitutes, credit facilities etc. In short, long run demand is that which will ultimately exist as a result of changes in pricing, promotion or product improvement, after enough time is allowed to let the market adjust to the new situation. For example, if electricity rates are reduced, in the short run, the existing users will make greater use of electric appliances. In the long run, more and more people will be induced to buy and use electric appliances.

The above distinction is important because each of these goods exhibit distinctive characteristics which should be taken into account while analysing demand for them.

1.9.5 Factors Affecting Demand for Non-Durable Consumer Goods

There are three basic factors which influence the demand for these goods:

- (i) **Disposable income:** Other things being equal, the demand for a commodity depends upon the disposable income of the household. Disposable income is found out by deducting personal taxes from personal income.
- (ii) **Price:** Other things being equal, the demand for a commodity depends upon its own price and the prices of related goods (its substitutes and complements). While the demand for a good is inversely related to its own price and the price of its complements, it is positively related to the price of its substitutes.
- (iii) **Demography:** This involves the characteristics of the population, human as well as non-human, using the product concerned. For example, it may pertain to the number and characteristics of children in a study of demand for toys and characteristics of automobiles in a study of the demand for tyres or petrol.

Non durables are purchased for current consumption only. From a business firm's point of view, demand for non durable goods gets repeated depending on the nature of the non durable goods. Usually, non durable goods come in wide varieties and there is competition among the sellers to acquire and retain customer loyalty.

1.9.6 Factors Affecting the Demand for Durable-Consumer Goods

Demand for durable goods has certain special characteristics. Following are the important factors that affect the demand for durable goods.

- (i) A consumer can postpone the replacement of durable goods. Whether a consumer will go on using the good for a long time or will replace it depends upon factors like his social status, prestige, level of money income, rate of obsolescence etc.
- (ii) These goods require special facilities for their use e.g. roads for automobiles, and electricity for refrigerators and radios. The existence and growth of such factors is an important variable that determines the demand for durable goods.
- (iii) As consumer durables are used by more than one person, the decision to purchase may be influenced by family characteristics like income of the family, size, age distribution and sex composition. Likely changes in the number of households should be considered while determining the market size of durable goods.
- (iv) Replacement demand is an important component of the total demand for durables. Greater the current holdings of durable goods, greater will be the replacement demand. Therefore, all factors that determine replacement demand should be considered as a determinant of the demand for durable goods.
- (v) Demand for consumer durables is very much influenced by their prices and credit facilities available to buy them.

1.9.7 Factors Affecting the Demand for Producer Goods

Since producers' goods or capital goods help in further production, the demand for them is derived demand, derived from the demand of consumer goods they produce. The demand for them depends upon the rate of profitability of user industry and the size of the market of the user industries. Hence data required for estimating demand for producer goods (capital goods) are:

- (i) growth prospects of the user industries;

- (ii) norms of consumption of capital goods per unit of installed capacity.

An increase in the price of a substitutable factor of production, say labour, is likely to increase the demand for capital goods. On the contrary, an increase in the price of a factor which is complementary may cause a decrease in the demand for capital.

Higher the profit making prospects, greater will be the inducement to demand capital goods. If firms are optimistic about selling a higher output in future, they will have greater incentive to invest in producer goods. Advances in technology enabling higher efficiency at reduced cost on account of higher productivity of capital will have a positive impact on investment in capital goods. Investments in producer goods will be greater when lower interest rates prevail as firms will have lower opportunity cost of investments and lower cost of borrowing.

1.9.8 Methods of Demand Forecasting

There is no easy method or simple formula which enables an individual or a business to predict the future with certainty or to escape the hard process of thinking. The firm has to apply a proper mix of judgment and scientific formulae in order to correctly predict the future demand for a product. The following are the commonly available techniques of demand forecasting:

- (i) **Survey of Buyers' Intentions:** The most direct method of estimating demand in the short run is to ask customers what they are planning to buy during the forthcoming time period, usually a year. This method involves direct interview of potential customers. Depending on the purpose, time available and costs to be incurred, the survey may be conducted by any of the following methods:

- Complete enumeration method where nearly all potential customers are interviewed about their future purchase plans
- Sample survey method under which only a scientifically chosen sample of potential customers are interviewed
- End-use method, especially used in forecasting demand for inputs, involves identification of all final users, fixing suitable technical norms of consumption of the product under study, application of the norms to the desired or targeted levels of output and aggregation.

Thus, under this method the burden of forecasting is put on the customers. However, it would not be wise to depend wholly on the buyers' estimates and they should be used cautiously in the light of the seller's own judgement. A number of biases may creep into the surveys. The customers may themselves misjudge their requirements, may mislead the surveyors or their plans may alter due to various factors which are not identified or visualised at the time of the survey.

This method is useful when bulk of sale is made to industrial producers who generally have definite future plans. In the case of household customers, this method may not prove very helpful for several reasons viz. irregularity in customers' buying intentions, their inability to foresee their choice when faced with multiple alternatives, and the possibility that the buyers' plans may not be real, but only wishful thinking.

- (ii) **Collective opinion method:** This method is also known as sales force opinion method or grass roots approach. Firms having a wide network of sales personnel can use the knowledge, experience and skills of the sales force to forecast future demand. Under this method, salesmen are required to estimate expected sales in their respective territories. The rationale of this method is that salesmen being closest to the customers are likely to have the most intimate feel of the reactions of customers to changes in the market.

These estimates of salesmen are consolidated to find out the total estimated sales. These estimates are reviewed to eliminate the bias of optimism on the part of some salesmen and pessimism on the part of others. These revised estimates are further examined in the light of factors like proposed changes in selling prices, product designs and advertisement programmes, expected changes in competition and changes in secular forces like purchasing power, income distribution, employment, population, etc. The final sales forecast would emerge after these factors have been taken into account.

Although this method is simple and based on first hand information of those who are directly connected with sales, it is subjective as personal opinions can possibly influence the forecast. Moreover salesmen may be unaware of the broader economic changes which may have profound impact on future demand. Therefore forecasting could be useful in the short run, for long run analysis however, a better technique is to be applied.

(iii)

Expert Opinion method: In general, professional market experts and consultants have specialised knowledge about the numerous variables that affect demand. This, coupled with their varied experience enables them to provide reasonably reliable estimates of probable demand in future. Information is elicited from them through appropriately structured unbiased tools of data collection such as interview schedules and questionnaires.

The Delphi technique, developed by Olaf Helmer at the Rand Corporation of the USA, provides a useful way to obtain informed judgments from diverse experts by avoiding the disadvantages of conventional panel meetings. Under this method, instead of depending upon the opinions of buyers and salesmen, firms solicit the opinion of specialists or experts through a series of carefully designed questionnaires. Experts are asked to provide forecasts and reasons for their forecasts. Experts are provided with information on opinion feedbacks of others at different rounds without revealing the identity of the opinion provider. These opinions are then exchanged among the various experts and the process goes on until convergence of opinions is arrived at. The following chart shows the Delphi process.

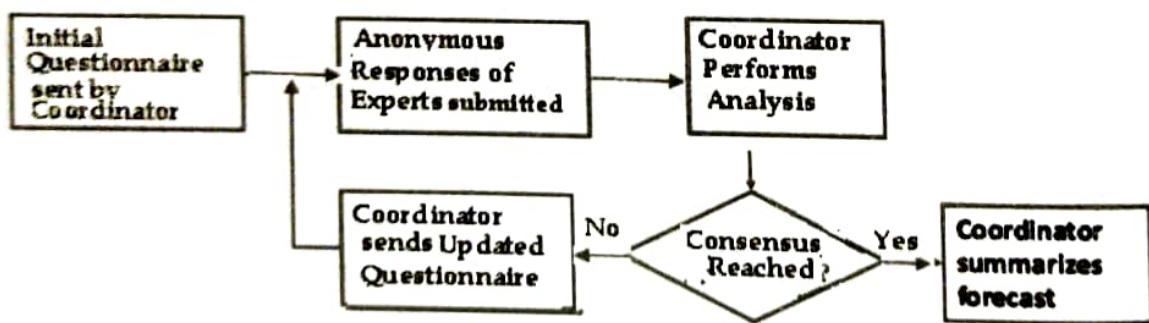


Fig: 12 The Delphi process

The Delphi method is best suited in circumstances where intractable changes are occurring and the relevant knowledge is distributed among experts spread over different geographical locations. For example, the method may be used for forecasting national energy demand 50 years from now, long term transportation needs, environmental issues and long term human resource forecasting to mention a few. Delphi technique is widely accepted due to its broader applicability, absence of group pressure, capability to tap collective human expertise and intelligence and ability to address complex questions. It also has the advantages of speed and cheapness.

(iv) Statistical methods: statistical methods have proved to be very useful in forecasting demand. Forecasts using statistical methods are considered as superior methods because they are more scientific, reliable and free from subjectivity. The important statistical methods of demand forecasting are:

- (a) **Trend Projection method:** This method, also known classical method, is considered as a 'naive' approach to demand forecasting. A firm which has been in existence for a reasonably long time would have accumulated considerable data on sales pertaining to different time periods. Such data, when arranged chronologically, yield a 'time series'. The time series relating to sales represent the past pattern of effective demand for a particular product. Such data can be used to project the trend of the time series.
- The trend projection method assumes that factors responsible for the past trend in demand will continue to operate in the same manner and to the same extent as they did in the past in determining the magnitude and direction of demand in future. The popular techniques of trend projection based on time series data are; graphical method and fitting trend equation or least square method.
- (i) **Graphical Method:** This method, also known as 'free hand projection method' is the simplest and least expensive. This involves plotting of the time series data on a graph paper and fitting a free-hand curve to it passing through as many points as possible. The direction of the curve shows the trend. This curve is extended into the future for deriving the forecasts. The direction of this free hand curve shows the trend. The main draw-back of this method is that it may show the trend but the projections made through this method are not very reliable.
 - (ii) **Fitting trend equation:** Least Square Method: It is a mathematical procedure for fitting a line to a set of observed data points in such a manner that the sum of the squared differences between the calculated and observed value is minimised. This technique is used to find a trend line which best fit the available data. This trend is then used to project the dependant variable in the future. This method is very popular because it is simple and in-expensive. Moreover, the trend method provides fairly reliable estimates of future demand.
- The least square method is based on the assumption that the past rate of change of the variable under study will continue in the future. The forecast based on this method may be considered reliable only for the period during which this assumption holds. The major limitation of this method is that it cannot be used where trend is cyclical with sharp turning points of troughs and peaks. Also, this method cannot be used for short term forecasts.
- (b) **Regression analysis:** This is the most popular method of forecasting demand. Under this method, a relationship is established between the quantity demanded (dependent variable) and the independent variables (explanatory variables) such as income, price of the good, prices of related goods etc. Once the relationship is established, we derive regression equation assuming the relationship to be linear. The equation will be of the form $Y = a + bX$. There could also be a curvilinear relationship between the dependent and independent variables. Once the regression equation is derived, the value of Y i.e. quantity demanded can be estimated for any given value of X .

(v)

Controlled Experiments: Under this method, future demand is estimated by conducting market studies and experiments on consumer behaviour under actual, though controlled, market conditions. This method is also known as market experiment method. An effort is made to vary separately certain determinants of demand which can be manipulated, for example, price, advertising, etc., and conduct the experiments assuming that the other factors would remain constant. Thus, the effect of demand determinants like price, advertisement, packaging, etc., on sales can be assessed by either varying them over different markets or by varying them over different time periods in the same market. The responses of demand to such changes over a period of time are recorded and are used for assessing the future demand for the product. For example, different prices would be associated with different sales and on that basis the price-quantity relationship is estimated in the form of regression equation and used for forecasting purposes. It should be noted however, that the market divisions here must be homogeneous with regard to income, tastes, etc.

The method of controlled experiments is used relatively less because this method of demand forecasting is expensive as well as time consuming. Moreover, controlled experiments are risky too because they may lead to unfavourable reactions from dealers, consumers and competitors. It is also difficult to determine what conditions should be taken as constant and what factors should be regarded as variable so as to segregate and measure their influence on demand. Besides, it is practically difficult to satisfy the condition of homogeneity of markets.

Market experiments can also be replaced by 'controlled laboratory experiments' or 'consumer clinics' under which consumers are given a specified sum of money and asked to spend in a store on goods with varying prices, packages, displays etc. The responses of the consumers are studied and used for demand forecasting.

(vi)

Barometric method of forecasting: The various methods suggested till now are related with the product concerned. These methods are based on past experience and try to project the past into the future. Such projection is not effective where there are economic ups and downs. As mentioned above, the projection of trend cannot indicate the turning point from slump to recovery or from boom to recession. Therefore, in order to find out these turning points, it is necessary to find out the general behaviour of the economy.

Just as meteorologists use the barometer to forecast weather, the economists use economic indicators to forecast trends in business activities. This information is then used to forecast demand prospects of a product, though not the actual quantity demanded. For this purpose, an index of relevant economic indicators is constructed. Movements in these indicators are used as basis for forecasting the likely economic environment in the near future.

There are leading indicators, coincidental indicators and lagging indicators. The leading indicators move up or down ahead of some other series. For example, the heavy advance orders for capital goods give an advance indication of economic prosperity. Increase in the number of construction permits for new houses will be reflected in corresponding increase in the number of sheets of glass ordered several months later.

The coincidental indicators, however, move up and down simultaneously and are witnessed at around the same time the changes they signal occur. Since these happen almost in real time, they do not offer much predictive insight, but provide a fair reading of the current scenario. For example, Figures on retail sales, rate of unemployment and Index of Industrial Production (IIP).

The lagging indicators follow a change after some time lag. The heavy household electrical connections confirm the fact that heavy construction work was undertaken during the past with a lag of some time.

SUMMARY

- Buyers constitute the demand side of the market; sellers make the supply side of that market. The quantity that consumers buy at a given price determines the size of the market.
- Demand means desire or wish to buy and consume a commodity or service backed by adequate ability to pay and willingness to pay
- The important factors that determine demand are price of the commodity, price of related commodities, income of the consumer, tastes and preferences of consumers, consumer expectations regarding future prices, size of population, composition of population, the level of national income and its distribution, consumer-credit facility and interest rates.
- The law of demand states that people will buy more at lower prices and less at higher prices, other things being equal.
- A demand schedule is a table that shows various prices and the corresponding quantities demanded. The demand schedules are of two types; individual demand schedule and market demand schedule.
- According to Marshall, the demand curve slopes downwards due to the operation of the law of diminishing marginal utility. However, according to Hicks and Allen it is due to income effect and substitution effect.
- The demand curve usually slopes downwards; but exceptionally slopes upwards under certain circumstances as in the case of conspicuous goods, Giffen goods, conspicuous necessities, future expectations about prices, demand for necessities and speculative goods.
- When the quantity demanded decreases due to a rise in own price, it is contraction of demand. On the contrary, when the price falls and the quantity demanded increases it is extension of demand.
- The demand curve will shift to the right when there is a rise in income (unless the good is an inferior one), a rise in the price of a substitute, a fall in the price of a complement, a rise in population and a change in tastes in favour of commodity. The opposite changes will shift the demand curve to the left.
- Elasticity of demand refers to the degree of sensitiveness or responsiveness of demand to a change in any one of its determinants. Elasticity of demand is classified mainly into four kinds. They are price elasticity of demand, income elasticity of demand, advertisement elasticity and cross elasticity of demand.
- Price elasticity of demand refers to the percentage change in quantity demanded of a commodity as a result of a percentage change in price of that commodity. Because demand curve slopes downwards and to the right, the sign of price elasticity is negative. We normally ignore the sign of elasticity and concentrate on the coefficient. Greater the absolute coefficient, greater is the price elasticity.
- In point elasticity, we measure elasticity at a given point on a demand curve. When the price change is somewhat larger or when price elasticity is to be found between two prices or two points on the demand curve, we use arc elasticity
- Income elasticity of demand is the percentage change in quantity demanded of a commodity as a result of a percentage change in income of the consumer. Goods and services are classified as luxuries, normal or inferior, depending on the responsiveness of spending on a product relative to percentage change in income.

- The cross elasticity of demand is the percentage change in the quantity demanded of commodity X as a result of a percentage change in the price of some related commodity Y. Products can be substitutes, and their cross elasticity is then positive; cross elasticity is negative for products that are complements.
- Advertisement elasticity of sales or promotional elasticity of demand measures the responsiveness of a good's demand to changes in the firm's spending on advertising.
- Forecasting of demand is the art and science of predicting the probable demand for a product or a service at some future date on the basis of certain past behaviour patterns of some related events and the prevailing trends in the present.
- The commonly available techniques of demand forecasting are survey of buyers' intentions, collective opinion method, expert opinion method, barometric method, and statistical methods such as trend projection method, graphical method, least square method, regression analysis, and market studies such as controlled experiments, and controlled laboratory experiments,