

1.2 Demand

It must be remembered that demand in Economics is always stated with reference to a particular price. Any change in price will normally bring about a change in the quantity demanded. In addition to price, demand is also used in reference to a particular period of time. For Example- demand for umbrellas will not be as high in winter as during rains. The demand for any commodity or service, therefore, must be stated with reference to the price and the relevant point of time.

We know that people have numerous wants which vary in intensity and quality. Just desiring or wanting things is not enough to create a demand. Suppose, a mill worker desires or wants to have a car but does not have the necessary means to buy it.

This desire is ineffective and will not become a demand. Similarly, a miser may desire to have the car, has means to purchase it, but will not spend the money. His desire would also not constitute a demand. Thus, we define demand for a commodity or service as an effective desire, i.e., a desire backed by means as well as willingness to pay for it.

The demand arises out of the following three things:

- i. Desire or want of the commodity.
- ii. Ability to pay,
- iii. Willingness to pay.

Only when all these three things are present then the consumer presents his demand in the market.

Definitions:

“Demand for a commodity is the quantity which a consumer is willing to buy at a particular price at a particular time.”

“The demand for anything, at a given price, is the amount of it which will be bought per unit of time at that price.” -PROF. BENHAM

“By demand, we mean the quantity of a commodity that will be purchased at a particular price and not merely the desire of a thing.”-HANSEN

Demand Function:

Demand function shows the relationship between quantity demanded for a particular commodity and the factors influencing it. It can be either with respect to one consumer or to all the consumers in the market.

A consumer's demand for a commodity is influenced by the following factors:

1. A consumer's demand for a commodity is influenced by the price of that commodity. Usually the higher the price, the lower will be the quantity demanded.
2. A consumer's demand for a commodity is influenced by the size of his income. In most cases, the larger the income, the greater will be the quantity demanded.
3. A consumer's demand for a commodity is influenced by the prices of related commodities. They may be complementary or substitutes.
4. The tastes of the consumers.

In technical language, it is said that the demand for a commodity is a function of the four variables like:

$$q = f(P, Y, P_r, T)$$

Where q stands for quantity demanded, P stands for the price of the commodity in question, Y stands for the income of the consumer, P_r indicates prices of the related commodities and T denotes the Tastes of the consumer and f stands for function. But in practice the three of these four variables remain constant. And hence the demand function takes the form of-

$$q = f(P)$$

Factors Determining Individual Demand:

Demand is not dependent on price alone. There are many other factors which affect the demand of a product.

These factors are as follows:

1.Price of the Product: Demand for a commodity depends on its price. As price rises, for a normal good, demand falls and vice-versa. However, there are exceptions, i.e., for Giffen goods, as price rises demand also rises.

2. Income of the Consumer: A key determinant of demand is the level of income i.e., the higher the level of income the higher the demand for a given commodity. Consumer's income and quantity demanded are generally related positively. It means that when income of the consumer rises he wants to have more units of that commodity and when his income falls he reduces the demand.

In consumer theory, an inferior good is a good that decreases in demand when consumer income rises i.e., increase in income reduces the demand because the consumer shifts his consumption to superior goods and forgoes his existing product. Thus reducing its demand.

Cheaper cars are examples of the inferior goods. Consumers will generally prefer cheaper cars when their income is constricted. As a consumer's income increases the demand for cheap cars decreases and demand for costly cars increases.

3. Prices of Related Goods: Consumption choices are also influenced by the alternative options available to users in the relevant market place. Market information regarding alternative products, quality, convenience and dependability all influence choices.

The two products may be related in two ways- Firstly, as complementary goods and secondly as substitute goods.

Complementary goods are those goods which are used jointly and consumed together like tennis ball and a racket, petrol and car. The relationship between the price of a product and the quantity demanded of another is inverse. For example if the price of cars were to rise, less people would choose to buy and use cars, switching perhaps to public transport-trains. It follows that under these circumstances the demand for the complementary good petrol would also decrease.

Goods which are perceived by the consumer to be alternatives to a product are termed as substitute goods. There is direct relationship between the demand for a product and the price of its substitute. Example- scooter and a motorcycle, tea and coffee.

The increase in price of tea would decrease its quantity demanded and people would switch over to its substitute commodity coffee.

4. Consumer's Tastes and Preferences: Demand for a product is also affected by the tastes and preferences of the consumers. As tastes and preferences shift from one commodity to the other, demand for the first commodity reduces and that of the other rises.

5. Expectation of Future Prices: The current demand of a product also depends on its expected price in future. If future price is expected to rise, its present demand immediately increases because the consumer has a tendency to store it at low prices for his future consumption. If, however the price of a product is expected to fall then he has a tendency to postpone its consumption and as a result the present demand would also fall.

This is often the case on Budget Day, when consumers rush to fill their petrol tanks prior to an expected increase in taxation. The reverse is also true, in that an expectation that prices are about to fall, will decrease current demand, as consumers will await for the expected price reduction.

6. Economic Conditions: The demand for commodities also depends upon prevailing business conditions in the country. For, example- during the inflationary period, more money is in circulation and people have more purchasing power. This causes an increase in demand of various goods even at higher prices. Similarly, during deflation (depression), the demand for various goods reduces in spite of lower prices because people do not have enough money to buy.

Factors Determining Market Demand:

Market demand for a commodity means the sum total of the demand of all individuals. Market demand depends, not only on the prices of the commodity and prices of related commodities but also on the number of factors.

These are:

1. Pattern of Income Distribution: If National income is equitably distributed, there will be more demand and vice-versa. If income distribution moves in favour of down-trodden people, then demand for such commodities, which are used by common people would increase. On the other hand, if the major part of National income is concentrated in the hands of only some rich people, the demand for luxury goods will increase.

2. Demographic Structure: Market demand is influenced by change in size and composition of population. Increase in population leads to more demand for all types of goods and decrease in population means less demand for them. Composition of population also affects its demand. Composition refers to the number of children, adults, males, females etc., in the population. When the composition changes, for example, when the number of females exceeds to that of the males, then there will be more demand for goods required by women folk.

3. Government Policy: Government policy of a country can also affect the demand for a particular commodity or commodities through taxation. Reduction in the taxes and duties will allow more persons to enter a particular market and thus raising the demand for a particular product.

4. Season and Weather: Demands for commodities also depend upon the climate of an area and weather. In cold hilly areas woollens are demanded. During summer and rainy season demand for umbrellas may rise. In winter ice is not so much demanded.

5. State of Business: The levels of demand in a market for different goods depend upon the business condition of the country. If the country is passing through boom, the trade is active and brisk. The demand for all commodities tends to rise. But in the days of depression, when trade is dull and slow, demand tends to fall.

Demand Schedule:

The demand schedule in economics is a table of quantity demanded of a good at different price levels. Given the price level, it is easy to determine the expected quantity demanded. This demand schedule can be graphed as a continuous demand curve on a chart where the Y-axis represents price and the X-axis represents the quantity.

According to PROF. ALFRED MARSHALL, “Demand schedule is a list of prices and quantities”. In other words, a tabular statement of price-quantity relationship between two variables is known as the demand schedule.

The demand schedule in the table represents different quantities of commodities that are purchased at different prices during a certain specified period (it can be a day or a week or a month).

The demand schedule can be classified into two categories:

1. Individual demand schedule;
2. Market demand schedule.

1. Individual Demand Schedule:

It represents the demand of an individual’ for a commodity at different prices at a particular time period. The adjoining table 7.1 shows a demand schedule for oranges

Table 7-1 : Individual Demand Schedule

Price of Oranges (₹ per kg.)	Quantity of Oranges Demanded (kg.)
15	2
12	3
9	4
6	5
3	6

2. Market Demand Schedule:

Market Demand Schedule is defined as the quantities of a given commodity which all consumers will buy at all possible prices at given moment of time. In a market, there are several consumers, and each has a different liking, taste, preference and income. Every consumer has a different demand.

The market demand actually represents the demand of all the consumers combined together. When a particular commodity has several brands or types of commodities, the market demand schedule becomes very complicated because of various factors. However, for a single item, the

market demand schedule is rather simple. Study the market demand schedule for milk in table 7.2.

Table 7-2 : Market Demand Schedule

Price of Milk per litre (in ₹)	Demand of Mr. X. (in Litres)	Demand of Mr. Y. (in Litres)	Market Demand (in Litres)
5	1	2	1 + 2 = 3
4	2	3	2 + 3 = 5
3	3	4	3 + 4 = 7
2	4	5	4 + 5 = 9
1	5	6	5 + 6 = 11

Demand Curves (Diagram):

The demand curve is a graphic statement or presentation of the relationship between product price and the quantity of the product demanded. It is drawn with price on the vertical axis of the graph and quantity demanded on the horizontal axis.

Demand curve does not tell us the price. It only tells us how much quantity of goods would be purchased by the consumer at various possible prices.

Depending upon the demand schedule, the demand curve can be as follows:

1. Individual Demand Curve
2. Market Demand Curve

1. Individual Demand Curve:

An Individual Demand Curve is a graphical representation of the quantities of a commodity that an individual (a particular consumer) stands ready to take off the market at a given instant of time against different prices. In Fig. 7.1, an Individual Demand Curve is drawn on the basis of Individual Demand Schedule given above in table 7.1.

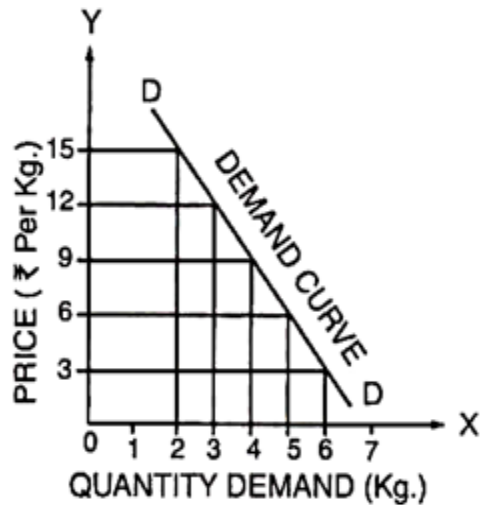


Fig. 7-1

2. Market Demand Curve:

A Market Demand Curve is a graphical representation of the quantities of a commodity which all the buyers in the market stand ready to take off at all possible prices at a given moment of time. In Figure 7.2 a Market Demand Curve is drawn on the basis of Market Demand Schedule given in Table 7.2.

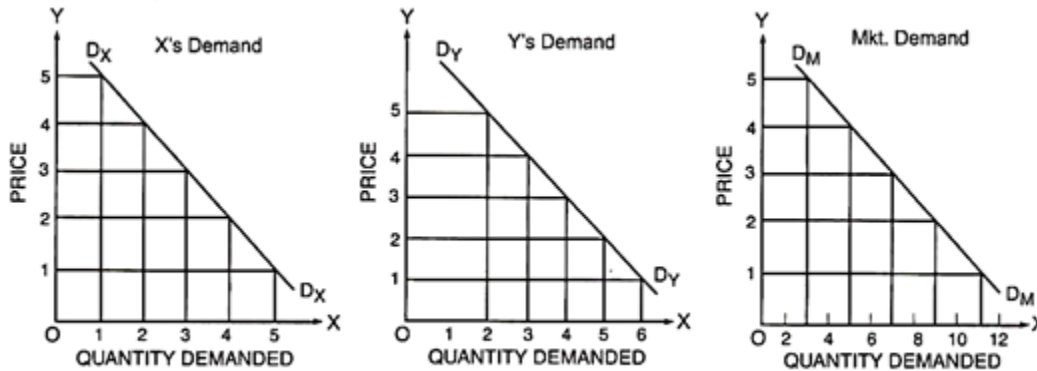


Fig. 7.2 Market Demand Curve

Both, the individual consumer's demand curve is a straight line. A demand curve will slope downward to the right.

It is not necessary, that the demand curve is a straight line. A demand curve may be a convex curve or a concave curve. It may take any shape provided it is negatively sloped.

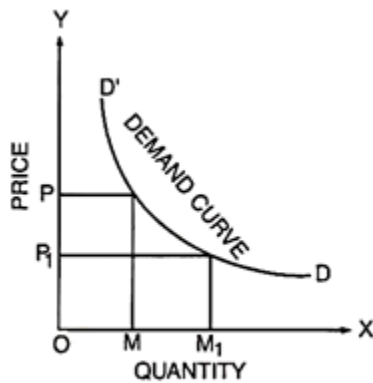


Fig. 7.3

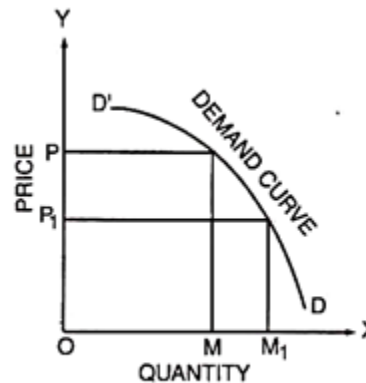


Fig. 7.4

Notes on Law of Demand:

The law of demand expresses functional relationship between price and the quantity. It has been universally observed that people buy more quantity of goods when, they are available at a lower price and the quantity purchased declines with an increase in its price.

“A rise in the price of a commodity or service is followed by a fall in quantity demanded, and a fall in price is followed by an increase in quantity demanded”. Thus, lower the price, the larger is the quantity demanded of a commodity and vice-versa.

The law thus, states that other things being equal the quantity demanded varies inversely with price. Lower the price, greater is the effective demand; higher the price; lesser is the effective demand.

Characteristics of Law of Demand:

The law of demand has three specific characteristics:

1. General Tendency,
2. Relation to Time, and
3. Price and Demand Relationship.

1. General Tendency:

The law simply indicates a general tendency of changes in quantity demanded with the changes in prices. However, it does not mention any specific propositions of changes in quantity demanded with changes in prices.

2. Relation to Time:

The law of demand is always related to time, because the price changes from time to time and these are never fixed. Thus, the co-relation between the prices and the quantities demanded should be considered for a specific time or at particular instant.

3. Price and Demand Relationship:

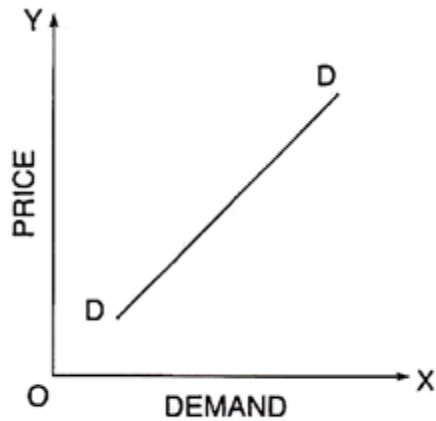
The increase or decrease in the prices does affect the quantity demanded at a particular time. Thus, the change in the quantity demanded cannot be considered without change in prices. It must, therefore, be noted that the relationship between price and quantity demanded is relative.

Assumptions of Law of Demand:

- i. The income of the consumer remains same during the period under consideration.
- ii. The prices of related goods remain unchanged during the period.
- iii. The preferences and tastes of consumers must remain the same during the period of consumption.
- iv. The quality of similar goods available in the market is almost unchanged.
- v. During the period under study, it is presumed that prices are not likely to change in near future.
- vi. No substitutes for the commodity in question are available.

Exceptions to the Law of Demand:

There are certain exceptions to the law of demand. It means that under certain circumstances, consumers buy more when the price of a commodity rises and less when the price falls. In such case the demand curve slopes upward from left to right i.e. demand curve has a positive slope as is shown in Fig. 7.5. Many causes can be attributed to an upward sloping demand curve.



Exception to Law of Demand:

1. Ignorance: Sometimes consumers are fascinated with the high priced goods from the idea of getting a superior quality. However, this may not be always true. Superior/deceptive packing and high price deceive the people. This can be called as ‘Ignorance effect’.

2. Speculative Effect: When the price of a commodity goes up, people may buy larger quantity than before, if they anticipate or speculate a further rise in its price. On the other hand, when the price falls, people may not react immediately and may still purchase the same quantity as before, waiting for another fall in the price. In both the cases, the law of demand fails to operate. This is known as speculative effect.

3. The Giffen Effect: A fall in the price of inferior goods (Giffen Goods) tends to reduce its demand and a rise in its price tends to extend its demand. This phenomenon was first observed by SIR ROBERT GIFFEN, popularly known as Giffen effect.

He observed that the working class families of U.K. were compelled to curtail their consumption of meat in order to be able to spend more on bread. Mr. Giffen, British economist, observed that rise in the price of bread caused the low paid British workers to buy more bread.

These workers lived mainly on the diet of bread, when price rose, as they had to spend more for a given quantity of bread, they could not buy as much meat as before. Bread still being comparatively cheaper was substituted for meat even at its high price.

4. Fear of Shortage: People may buy more of a commodity even at higher prices when they fear of a shortage of that commodity in near future. This is contrary to the law of demand. It may happen during times of war and inflation and mostly in the case of goods which fall in the category of necessities of life like sugar, kerosene oil, etc.

5. Prestigious Goods: This is explained by Prof. Thorstein Veblen. If consumers measure the desirability of a good entirely by its price and not by its use, then they buy more of a good at high price and less of a good at low price, Diamond, Jewellery and big cars etc., are such prestigious goods. In their case demand relates to consumers who use them as status symbol.

As their prices go up and become costlier, rich people think it is more prestigious to have them. So they purchase more. On the other hand, when their prices fall sharply, they buy less, as they are no more prestigious goods. This is known as (Veblen effect) or (Demonstration effect).

6. Conspicuous Necessities: Another exception occurs in use of such commodities as due to their constant use, have become necessities of life. For example, inspite of the fact that the prices of television sets, refrigerators, washing machines, cooking gas, scooters, etc., have been continuously rising, their demand does not show any tendency to fall. More or less same tendency can be observed in case of most of other commodities that can be termed as 'Upper-Sector Goods'.

7. Bandwagon Effect: The consumer's demand for a good may be affected by the tastes & preferences of the social class to which he belongs. If purchasing diamond becomes fashionable, then, as the price of diamond rises, rich people may increase their demand for diamonds in order to show that they are rich.

8. Snob Effect: People sometimes buy certain commodities like diamonds at high prices not due to their intrinsic worth but for a different reason. The basic object is to display their riches to the other members of the community to which they themselves belong. This is known as Snob appeal.

2.3 Elasticity of Demand

Meaning of Elasticity of Demand:

Demand extends or contracts respectively with a fall or rise in price. This quality of demand by virtue of which it changes (increases or decreases) when price changes (decreases or increases) is called Elasticity of Demand.

“The elasticity (or responsiveness) of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price”. – Dr. Marshall.

Elasticity means sensitiveness or responsiveness of demand to the change in price. This change, sensitiveness or responsiveness, may be small or great. Take the case of salt. Even a big fall in its price may not induce an appreciable extension in its demand. On the other hand, a slight fall in the price of oranges may cause a considerable extension in their demand. That is why we say that the demand in the former case is 'inelastic' and in the latter case it is 'elastic'.

The demand is elastic when with a small change in price there is a great change in demand; it is inelastic or less elastic when even a big change in price induces only a slight change in demand.

In the words of Dr. Marshall, “The elasticity (or responsiveness) of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price. “But the demand cannot be perfectly ‘elastic’ or ‘inelastic’.

Completely elastic demand will mean that a slight fall (or rise) in the price of the commodity concerned induces an infinite extension (or contraction) in its demand. Completely inelastic demand will mean that any amount of fall (or rise) in the price of the commodity would not induce any extension (or contraction) in its demand. Both these conditions are unrealistic. That is why we say that elasticity of demand may be ‘more or less’, but it is seldom perfectly elastic or absolutely inelastic.

Types of Elasticity: Distinction may be made between Price Elasticity, Income Elasticity and Cross Elasticity. Price Elasticity is the responsiveness of demand to change in price; income elasticity means a change in demand in response to a change in the consumer’s income; and cross elasticity means a change in the demand for a commodity owing to change in the price of another commodity.

Price Elasticity of Demand:

The extent of responsiveness of demand with change in the price is not always the same. The demand for a product can be elastic or inelastic, depending on the rate of change in the demand with respect to change in price of a product.

Elastic demand is the one when the response of demand is greater with a small proportionate change in the price. On the other hand, inelastic demand is the one when there is relatively a less change in the demand with a greater change in the price.

For better understanding the concepts of elastic and inelastic demand, the price elasticity of demand has been divided into five types, which are shown in Figure-1:

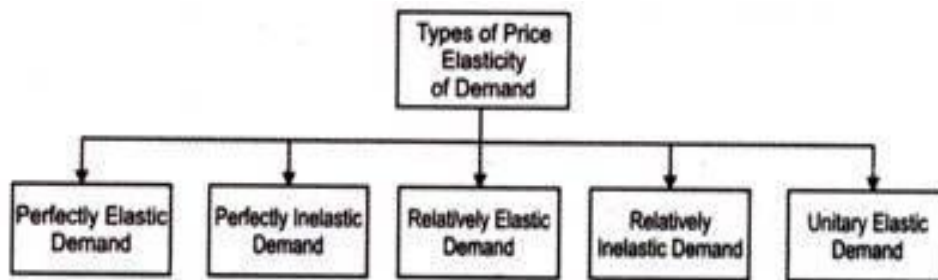


Figure-1: Different Types of Price Elasticity of Demand

Let us discuss the different types of price elasticity of demand (as shown in Figure-1).

1. Perfectly Elastic Demand:

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

The degree of elasticity of demand helps in defining the shape and slope of a demand curve. Therefore, the elasticity of demand can be determined by the slope of the demand curve. Flatter the slope of the demand curve, higher the elasticity of demand.

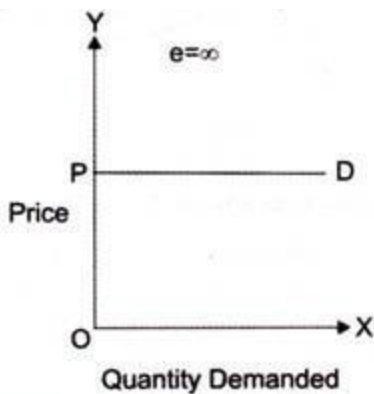


Figure-2: Perfectly Elastic Demand

In perfectly elastic demand, the demand curve is represented as a horizontal straight line, which is shown in Figure-2:

From Figure-2 it can be interpreted that at price OP, demand is infinite; however, a slight rise in price would result in fall in demand to zero. It can also be interpreted from Figure-2 that at price P consumers are ready to buy as much quantity of the product as they want. However, a small rise in price would resist consumers to buy the product.

Though, perfectly elastic demand is a theoretical concept and cannot be applied in the real situation. However, it can be applied in cases, such as perfectly competitive market

and homogeneity products. In such cases, the demand for a product of an organization is assumed to be perfectly elastic.

From an organization's point of view, in a perfectly elastic demand situation, the organization can sell as much as it wants as consumers are ready to purchase a large quantity of product. However, a slight increase in price would stop the demand.

2. Perfectly Inelastic Demand:

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

In case of perfectly inelastic demand, demand curve is represented as a straight vertical line, which is shown in Figure-3:

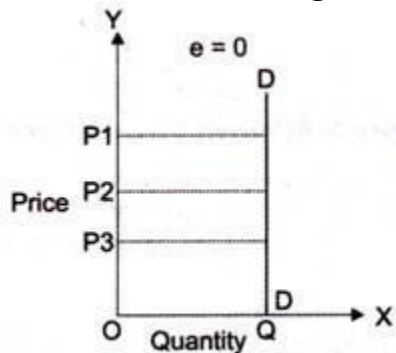


Figure-3: Perfectly Inelastic Demand

It can be interpreted from Figure-3 that the movement in price from OP1 to OP2 and OP2 to OP3 does not show any change in the demand of a product (OQ). The demand remains constant for any value of price. Perfectly inelastic demand is a theoretical concept and cannot be applied in a practical situation. However, in case of essential goods, such as salt, the demand does not change with change in price. Therefore, the demand for essential goods is perfectly inelastic.

3. Relatively Elastic Demand:

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

The demand curve of relatively elastic demand is gradually sloping, as shown in Figure-4:

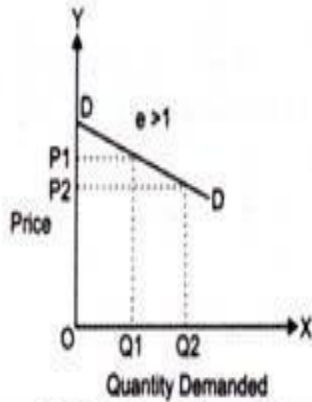


Figure-4: Relatively Elastic Demand

It can be interpreted from Figure-4 that the proportionate change in demand from OQ1 to OQ2 is relatively larger than the proportionate change in price from OP1 to OP2. Relatively elastic demand has a practical application as demand for many of products respond in the same manner with respect to change in their prices. For example, the price of a particular brand of cold drink increases from Rs. 15 to Rs. 20. In such a case, consumers may switch to another brand of cold drink. However, some of the consumers still consume the same brand. Therefore, a small change in price produces a larger change in demand of the product.

4. Relatively Inelastic Demand:

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

The demand curve of relatively inelastic demand is rapidly sloping, as shown in Figure-5:

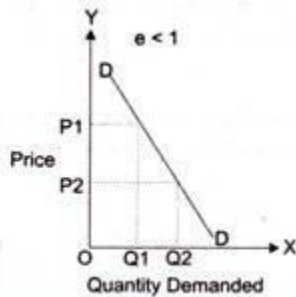


Figure-5: Relatively Inelastic Demand

It can be interpreted from Figure-5 that the proportionate change in demand from OQ1 to OQ2 is relatively smaller than the proportionate change in price from OP1 to OP2. Relatively inelastic demand has a practical application as demand for many of products respond in the same manner with respect to change in their prices. Let us understand the implication of relatively inelastic demand with the help of an example.

Example-3:

The demand schedule for milk is given in Table-3:

Table-3: Demand Schedule for Milk	
Price of Milk(per litre)	Quantity Demanded(litres)
15	100
20	90

Calculate the price elasticity of demand and determine the type of price elasticity.

Solution:

$$P = 15$$

$$Q = 100$$

$$P_1 = 20$$

$$Q_1 = 90$$

Therefore, change in the price of milk is:

$$\Delta P = P_1 - P$$

$$\Delta P = 20 - 15$$

$$\Delta P = 5$$

Similarly, change in quantity demanded of milk is:

$$\Delta Q = Q_1 - Q_2$$

$$\Delta Q = 90 - 100$$

$$\Delta Q = -10$$

The change in demand shows a negative sign, which can be ignored. This is because of the reason that the relationship between price and demand is inverse that can yield a negative value of price or demand.

Price elasticity of demand for milk is:

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

$$e_p = 10 / 5 * 15 / 100$$

$$e_p = 0.3$$

The price elasticity of demand for milk is 0.3, which is less than one. Therefore, in such a case, the demand for milk is relatively inelastic.

5. Unitary Elastic Demand:

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

The demand curve for unitary elastic demand is represented as a rectangular hyperbola, as shown in Figure-6:

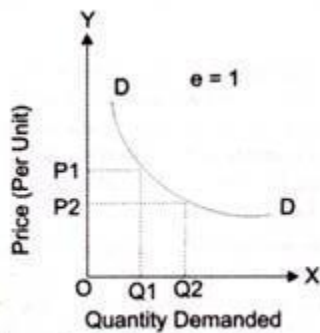


Figure-6: Unitary Elastic Demand

From Figure-6, it can be interpreted that change in price OP1 to OP2 produces the same change in demand from OQ1 to OQ2. Therefore, the demand is unitary elastic.

The different types of price elasticity of demand are summarized in Table-4:

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

Cross Elasticity of Demand:

The cross elasticity of demand for good X may be positive, negative or zero which depends on the nature of relation between the goods X and Y. This relation may be as substitutes, complementary or unrelated goods.

1. Substitute Goods: If X and Y are substitute goods, a fall in the price of good Y will reduce the quantity demanded of good X. Similarly, an increase in the price of good Y will raise the demand for good X. Their cross elasticity is positive because, given the price of X, a change in the price of Y will lead to a change in the quantity demanded of X in the same direction as in the price of Y. The cross elasticity of substitute goods is explained in Table 5.

Table 5 : Cross Elasticity of Substitutes

Commodity	Before Change		After Change	
	Price in Rs. Per K.G	Quantity (K.G)	Price in Rs. Per (K.G)	Quantity (K.G)
X (Tea)	20	400	20	500
Y (Coffee)	30	500	40	300

$$E_{xy} = \frac{\Delta Q_x}{\Delta P_y} \times \frac{P_y}{Q_x} = \frac{500 - 400}{40 - 30} \times \frac{30}{400}$$

$$= \frac{100}{10} \times \frac{30}{400} = (+) \frac{3}{4} \text{ or } (+) 0.75.$$

It is clear from the above that the coefficient of cross elasticity of substitute goods such as tea (X) and coffee (Y) is positive (+0.75) when with the rise in price of coffee, the price of tea being constant, the demand for tea also increases.

This is shown in Fig. 6 where the quantity of good X (tea) is taken on X-axis and the quantity of good Y is plotted on Y-axis. When the price of Y increases from OY to OY₁, the quantity demanded of X rises from OX to OX₁. The slope of the demand curve downwards to the right shows positive elasticity of both the goods.

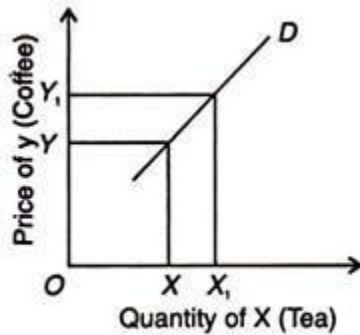


Fig. 6

2. Complementary Goods: If two goods are complementary (jointly demanded), rise in the price of one leads to a fall in the demand for the other. Rise in the prices of cars will bring a fall in their demand together with the demand for petrol. Similarly, a fall in the prices of cars will raise the demand for petrol. Since price and demand vary in the opposite direction, the cross elasticity of demand is negative.

The cross elasticity of complementary goods is explained in Table 6.

Table 6 : Cross Elasticity of Complementary

Goods	Before the Price Change		After the Price Change	
	Price in Rs. Per K.G	Quantity (K.G.)	Price in Rs. Per K.G	Quantity (K.G.)
X (Tea)	150	40	150	30
Y (Sugar)	15	100	20	80

$$E_{xy} = \frac{\Delta Q_x}{\Delta P_y} \times \frac{P_y}{Q_x} = \frac{30 - 40}{20 - 15} \times \frac{15}{40}$$

$$= \frac{-10}{5} \times \frac{15}{40} = \frac{-15}{20} = \frac{-3}{4} = (-) 0.75.$$

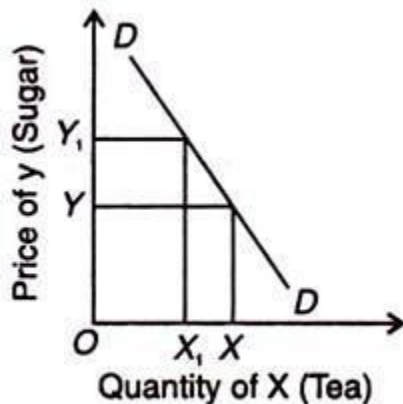


Fig. 7

In this case, the cross elasticity coefficient of complementary goods such as tea and sugar or car and petrol is negative.

This is explained in Fig.7 where with the rise in the price of Y (Sugar) from OY to OY₁ the demand for X (tea) falls from OX to OX₁. The slope of the demand curve downwards to the right indicates negative cross elasticity.

3. Unrelated Goods:

If the two goods are unrelated, a fall in the price of good Y has no effect whatsoever on the demand for good X. In such a case, the cross elasticity of demand is zero. For example, a fall in the price of tea has no effect on the quantity demanded of car. The cross elasticity of demand for unrelated goods is shown in Fig. 8. Even an increase in the price of good Y from OY to OY₁, the demand for good X remains the same as OD. Hence, the cross elasticity of demand for unrelated goods is zero.

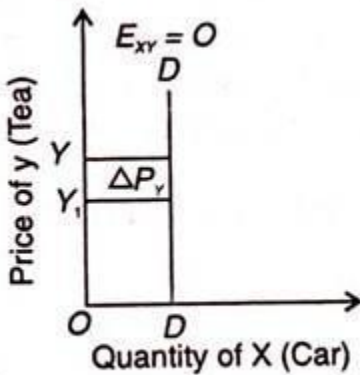


Fig. 8

Some Conclusions:

We may draw certain inferences from this analysis of the cross elasticity of demand.

(a) The cross elasticity between two goods, whether substitutes or complementary, is only a one-way traffic. The cross elasticity between butter and jam may not be the same as the cross elasticity of jam to butter. A 10% fall in the price of butter may cause a fall in the demand for jam by 5%.

But a 10% fall in the price of jam may lower the demand for butter by 2%. It shows that in the first case the coefficient is 0.5 and in the second case 0.2. The superior the substitute whose price changes, the higher is the cross elasticity of demand.

This rule also applies in the case of complementary goods. If the price of car falls by 5%, the demand for petrol may go up by 15%, giving a high coefficient of 3. But a fall in the price of petrol by 5% may lead to a rise in the demand for cars by 1%, giving a low coefficient of 0.2.

(b) Cross elasticities for both substitutes and complementary vary between zero and infinity. Generally, cross elasticity for substitutes is positive, but in exceptional circumstances it may also be negative.

(c) Commodities which are close substitutes have high cross elasticity and commodities with low cross elasticities are poor substitutes for each other. This distinction helps to define an industry. If some goods have high cross elasticity, it means that they are close substitutes.

Firms producing them can be regarded as one industry. A good having a low cross elasticity in relation to other goods may be regarded a monopoly product and its manufacturing firm becomes an industry by determining the boundary of an industry. Thus cross elasticities are simply guidelines.

Income Elasticity of Demand:

Domestically produced goods being close substitutes if the cross elasticity of demand for imports is high and if the prices of domestic goods increase due to inflation, the demand for imports will increase substantially which will deteriorate the balance of payments position.

If an increase in income leads to an increased demand for a commodity, the income elasticity coefficient (E_y) is positive. A commodity whose income elasticity is positive is a normal good because more of it is purchased as the consumer's income increases.

On the other hand, if an increase in income leads to a fall in the demand for a commodity, its income elasticity coefficient (E_y) is negative. Such a commodity is called inferior good because less of it is purchased as income increases. If the quantity of a commodity purchased remains unchanged regardless of the change in income, the income elasticity of demand is zero ($E_y = 0$).

Normal goods are of three types necessities, luxuries and comforts. In the case of luxuries, the coefficient of income elasticity is positive but high, $E_y > 1$. Income elasticity of demand is high when the demand for a commodity rises more than proportionate to the increase in income.

Assuming prices of all other goods as constant, if the income of the consumer increases by 5% and as a result his purchases of the commodity increase by 10%, then $E_y = 10/5 = 2 (> 1)$. Taking income on the vertical axis and the quantity demanded on the horizontal axis, the increase in demand $Q_1 Q_2$ is more than the rise in income $Y_1 Y_2$, as shown in Figure 9. The curve D_y shows a positive and elastic income demand.

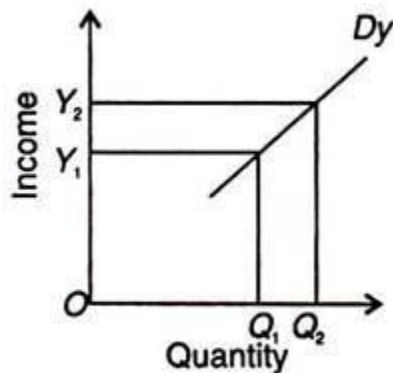


Fig. 9

In the case of necessities, the coefficient of income elasticity is positive but low, $E_y < 1$. Income elasticity of demand is low when the demand for a commodity rises less than proportionate to the rise in the income. If the proportion of income spent on a commodity increases by 2% when the consumer's income goes up by 5%, $E_y = 2/5 (< 1)$ Figure 10 shows a positive but inelastic income demand curve D_y because the increase in demand $Q_1 Q_2$ is less than proportionate to the rise in income $Y_1 Y_2$.

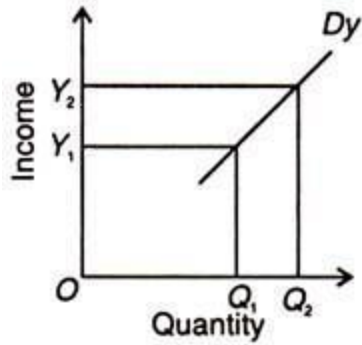


Fig. 10

In the case of comforts, the coefficient of income elasticity is unity ($E_y = 1$) when the demand for a commodity rises in the same proportion as the increase in income. For example, a 5% increase in income leads to 5% rise in demand, $E_y = 5/5 = 1$. The curve D_y in Figure 11 shows unitary income elasticity of demand. The increase in quantity demanded Q_1 Q_2 exactly equals the increase in income Y_1 Y_2 .

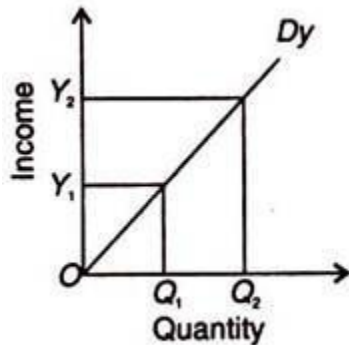


Fig. 11

The coefficient of income elasticity of demand in the case of inferior goods is negative. In the case of an inferior goods, the consumer will reduce his purchases of it, when his income increases. If a 5% increase in income leads to 2% reduction in demand, $E_y = -2/5 (<0)$. Figure 12 shows the D_y curve for an inferior goods which bends upwards from A to B when the quantity demanded decreases by Q_1 Q_2 with the rise in income by Y_1 Y_2 .

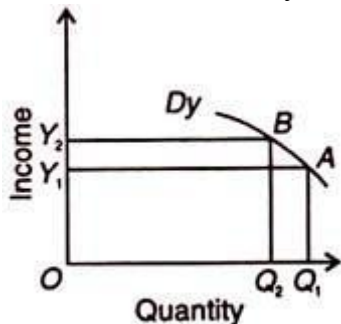


Fig. 12

If with increase in income, the quantity demanded remains unchanged, the coefficient of income elasticity, $E_y = 0$. If, say, with 5% increase in income, there is no change in the quantity

demanded, then $E_y = 0/5 = 0$. Figure 13 shows a vertical income demand curve D_y with zero elasticity.

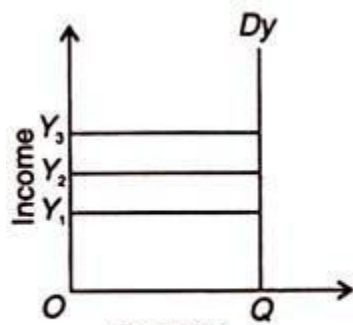


Fig. 13