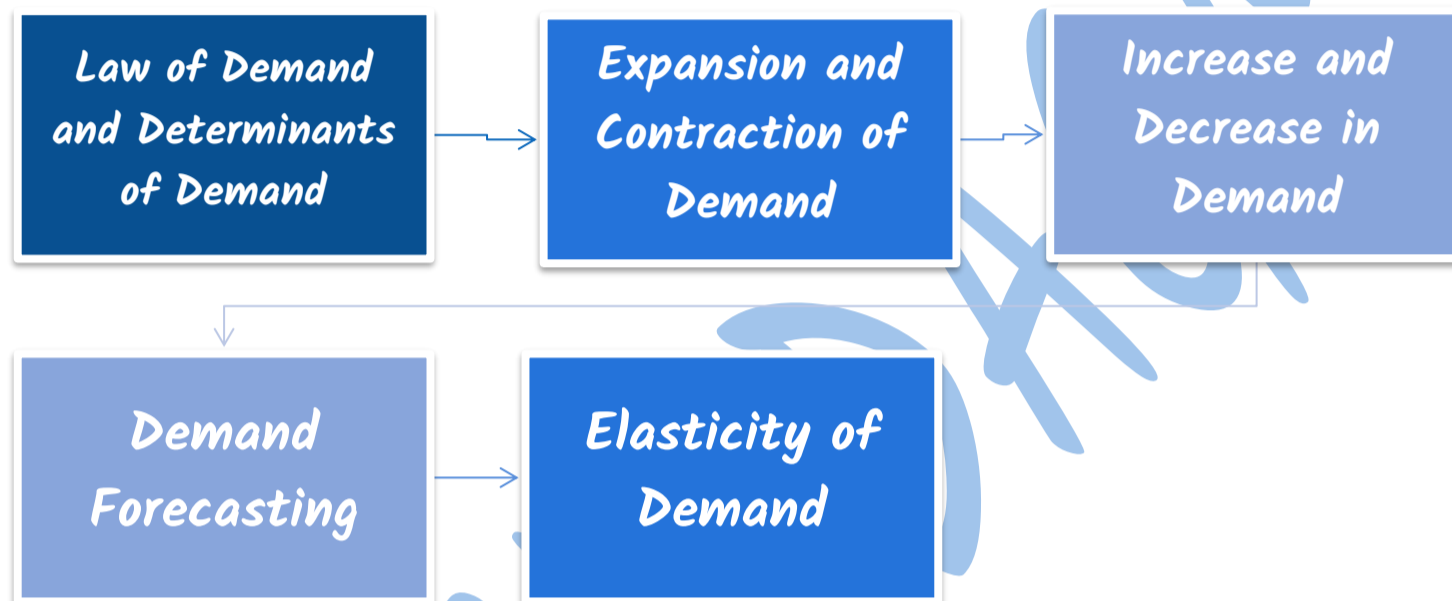




CHAPTER 2: THEORY OF DEMAND & SUPPLY

Unit 1: Law of Demand and Elasticity of Demand

Overview



The market system is governed by a market mechanism. In a market system, the price of a commodity or service is determined by the forces of demand and supply. While buyers constitute the demand side of the market, sellers make the supply side of that market.

Concept of Demand

Meaning of Demand: The 'demand' refers to the *quantity of a good or service that consumers are willing and able to purchase at various prices during a given period of time.*



Demand comparison with Desire

➤ It is to be noted that demand, in Economics, is something more than the desire to purchase, though desire is one element of it. A beggar, for instance, may desire food, but due to lack of means to purchase it, his demand is not effective. Thus, effective demand for a thing depends on *desire, means to purchase and willingness to use those means for that purchase.* Unless desire is backed by purchasing power or ability to pay, and willingness to pay, it does not constitute demand. It is only the Effective demand alone which would figure in economic analysis and business decisions.

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➤ **Two things are to be noted about the quantity demanded:**

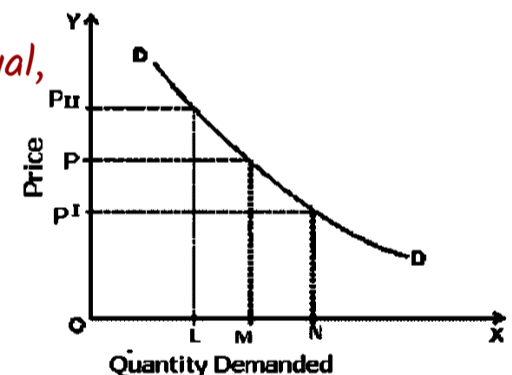
- The quantity demanded is always expressed at a given price. At different prices, different quantities of a commodity are generally demanded.
- The quantity demanded is a flow concept. We are concerned not with a single isolated purchase, but with a continuous flow of purchases and we must therefore express demand as 'so much per period of time'. Example: one thousand dozens of oranges per day, seven thousand dozens of oranges per week and so on.

Definition of Demand

“By demand, we mean the various quantities of a given commodity or service which consumers would buy in one market during a given period of time, at various prices, or at various incomes, or at various prices of related goods”.

Determinants of Demand

➤ **Price of the commodity:** *Ceteris paribus* i.e. other things being equal, the demand for a commodity is inversely related to its price. It implies that a rise in the price of a commodity brings about a fall in the quantity purchased and vice-versa.



➤ **Price of related commodities:** Related commodities are of two types: (a) complementary goods and (ii) competing goods or substitutes.

Complementary goods: → These are those goods which are *consumed together or simultaneously*. Example: tea and sugar, automobile and petrol and pen and ink.

→ When two commodities are complements, a fall in the price of one (other things being equal) will cause the demand for the other to rise. Example: A fall in the price of petrol-driven cars would lead to a rise in the demand for petrol. Similarly, a fall in the price of fountain pens will cause a rise in the demand for ink.

→ The reverse will be the case when the price of a complement rises. Thus, there is an inverse relation between the demand for a good and the price of its complement.

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Substitute Goods: → Two commodities are called competing goods or substitutes when they satisfy the same want and can be used with ease in place of one another. Example: tea and coffee, ink pen and ball pen, are substitutes for each other and can be used in place of one another easily.

→ When goods are substitutes, a fall in the price of one (*ceteris paribus*) leads to a fall in the quantity demanded of its substitutes. Example: if the price of tea falls, people will try to substitute it for coffee and demand more of it and less of coffee i.e. the demand for tea will rise and that of coffee will fall.

→ There is direct or positive relation between the demand for a product and the price of its substitutes

➤ **Income of the consumer:** Other things being equal, the demand for a commodity depends upon the money income of the consumer. The purchasing power of the consumer is determined by the level of his income.

Normal Goods

→ In most cases, the larger the average money income of the consumer, the larger is the quantity demanded of a particular good. The nature of the relationship between income and quantity demanded depends upon the nature of consumer goods.

Most of the consumption goods fall under the category of normal goods. These are demanded in increasing quantities as consumers' income increases. Example: Household furniture, clothing, automobiles, consumer durables and semi durables etc.

→ A change in consumers' income, although will cause an increase in demand for these necessities, but this increase will be less than proportional to the increase in income. This is because as people become richer, there is a relative decline in the importance of food and other non durable goods in the overall consumption basket and a rise in the importance of durable goods.

Inferior Goods

→ There are some commodities for which the quantity demanded rises only up to a certain level of income and decreases with an increase in money income beyond this level. These goods are called inferior goods.

Difference between normal goods and inferior goods

→ The same good may be normal for one condition and may be inferior in another. Example: Bajra may become an inferior good for a person when his income increases above a certain level and He



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can now afford better substitutes such as wheat. Demand for luxury goods and prestige goods arise beyond a certain level of consumers' income and keep rising as income increases.

➤ **Tastes and preferences of consumers:** The demand for a commodity also depends upon the tastes and preferences of consumers and changes in them over a period of time. Goods which are modern or more in fashion command higher demand than goods which are of old design and out of fashion. Consumers may perceive a product as obsolete and discard it before it is fully utilised and prefer another good which is currently in fashion. Example: there is greater demand for LCD/LED televisions and more and more people are discarding their ordinary television sets even though they could have used them for some more years.

➤ **'Demonstration effect' or 'bandwagon effect':** It plays an important role in determining the demand for a product. An individual's demand for LCD/LED television may be affected by his seeing one in his neighbour's or friend's house, either because he likes what he sees or because he figures out that if his neighbour or friend can afford it, he too can. A person may develop a taste or preference for wine after tasting some, but he may also develop it after discovering that serving it enhances his prestige.



➤ **Snob Effect or Veblen Effect:** On the contrary, when a product becomes common among all, some people decrease or altogether stop its consumption.

This is called the **'snob effect'**. Highly priced goods are consumed by status seeking rich people to satisfy their need for conspicuous consumption. This is called the **'Veblen effect'** (named after the American economist Thorstein Veblen). In any case, people have tastes and preferences and these change, sometimes, due to external and sometimes, due to internal causes and influence demand.



➤ Other Factors

→ **Size of population:** Generally, larger the size of population of a country or a region, greater is the demand for commodities in general.

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→ **Composition of population:** If there are more old people in a region, the demand for spectacles, walking sticks, etc. will be high. Similarly, if the population consists of more children, demand for toys, baby foods, toffees, etc. will be more.

→ **Distribution of income:** The level of *national income* is a crucial determinant of market demand. Higher the national income, higher will be the demand for all normal goods and services. The wealth of a country may be unevenly distributed so that there are a few very rich people while the majority are very poor. Under such conditions, the propensity to consume the country will be relatively less, because the propensity to consume the rich people is less than that of the poor people. Consequently, the demand for consumer goods will be comparatively less. If the distribution of income is more equal, then the propensity to consume of the country as a whole will be relatively high indicating higher demand for goods.

→ **Consumer-credit facility and interest rates:** Availability of credit facilities induces people to purchase more than what their current incomes permit them. Credit facilities mostly determine the demand for durable goods which are expensive and require bulk payments at the time of purchase. Low rates of interest encourage people to borrow and therefore demand will be more. Apart from above, factors such as government policy in respect of taxes and subsidies, business conditions, wealth, socioeconomic class, group, level of education, marital status, weather conditions, salesmanship and advertisements, habits, customs and conventions also play an important role in influencing demand.

Demand Function

→ The demand function states the relationship between the demand for a product (the dependent variable) and its determinants (the independent or explanatory variables).

→ A demand function expressed as follows:

$$D_x = f(P_X, M, P_Y, P_C, T, A)$$

Where, D_x is the quantity demanded of product X

P_X is the price of the commodity

M is the money income of the consumer

P_Y is the price of its substitutes

P_C is the price of its complementary goods

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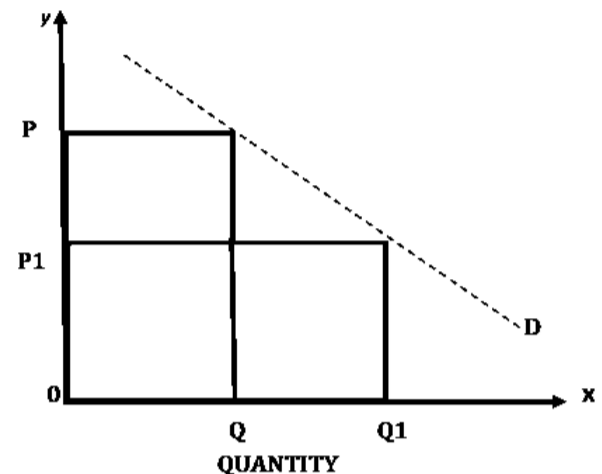
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T is consumer tastes, and preferences

A is advertisement expenditure.

Law of Demand

According to the law of demand, other things being equal, if the price of a commodity falls, the quantity demanded for it will rise and if the price of a commodity rises, its quantity demanded will decline. Thus, there is an inverse relationship between price and quantity demanded, *ceteris paribus*.



Definition of the Law of Demand

Prof. Alfred Marshall defined the Law "The greater the amount to be sold, the smaller must be the price at which it is offered in order that it may find purchasers or in other words the amount demanded increases with a fall in price and diminishes with a rise in price".

Demand Schedule

A demand schedule is a table which presents the different prices of a good and the corresponding quantity demanded per unit of time.

A demand schedule is drawn upon the assumption that all the other influences remain unchanged. It thus attempts to isolate the influence exerted by the price of the good upon the amount sold.

Demand schedule and curve are two types:

➤ **Individual demand schedule:** It shows the quantity of the commodities that one consumer will buy at selected prices.

TABLE (Demand schedule of an individual consumer)

	Price	Quantity demanded
A	5	10
B	4	15
C	3	20

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D	2	35
E	1	60

When the price of commodity X is ₹5 per unit, a consumer purchases 10 units of the commodity. When the price falls to ₹4, he purchases 15 units of the commodity. Similarly, when the price further falls, the quantity demanded by him goes on rising until at price ₹1, the quantity demanded by him rises to 60 units. The above table depicts an inverse relationship between price and quantity demanded as the price of the commodity X goes on rising, its demand goes on falling.

➤ **Market demand schedule:** When we add the individual demands for various schedules we get market demand schedule.

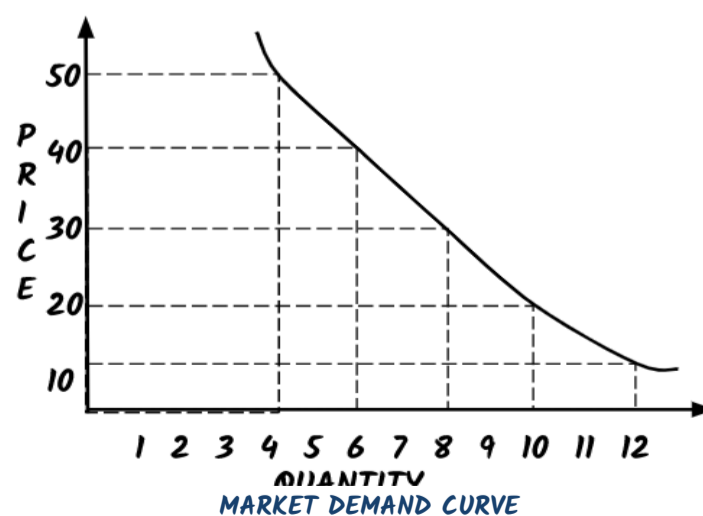
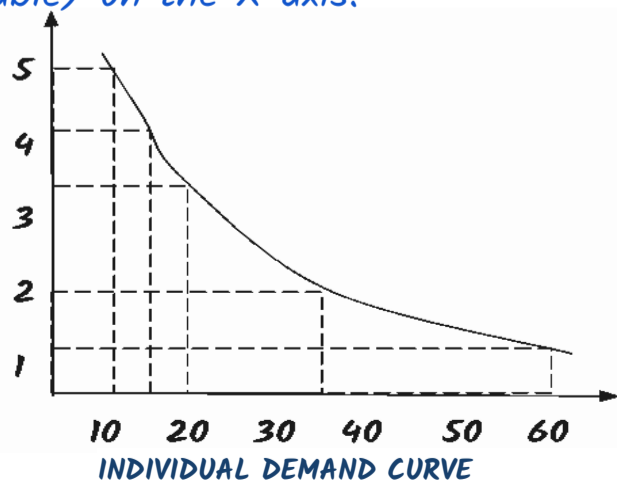
TABLE (Market Demand Schedule)

Price of Wheat ₹/kg.	Quantity Demanded in kgs.		Market Demand A+D
	Consumer A	Consumer D	
10	5	7	5+7= 12
20	4	6	4+6=10
30	3	5	3+5=8
40	2	4	2+4=6
50	1	3	1+3=4

It indicates that both individual demand and market demand have an inverse relationship between price and quantity demanded.

Demand Curve

A demand curve is a graphical representation of a demand schedule or demand function. A demand curve for any commodity can be drawn by plotting each combination of price and demand on a graph. Price (independent variable) is taken on the Y-axis and quantity demanded (dependent variable) on the X-axis.



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Market Demand Curve is flatter than individual Demand Curve.

Rationale of Law of Demand

Different economists have given different explanations for the operation of the law of demand. These are given below:

➤ **Law of diminishing marginal utility:** A consumer is in equilibrium when the marginal utility of the commodity and its price equalise. According to **Marshall**, the consumer has diminishing utility for each additional unit of a commodity and therefore, he will be willing to pay only less for each additional unit. A rational consumer will not pay more for lesser satisfaction. He is induced to buy additional units only when the prices are lower. The operation of diminishing marginal utility and the act of the consumer to equalise the utility of the commodity with its price result in a downward sloping demand curve.

➤ **Price effect:** The total fall in quantity demanded due to an increase in price is termed as Price effect. The law of demand can be dubbed as “Negative Price Effect” with some exceptions. The price effect manifests itself in the form of income effect and substitution effect.

→ **Substitution effect:** Hicks and Allen have explained the law in terms of substitution effect and the income effect. When the price of a commodity falls, it becomes relatively cheaper than other commodities. Assuming that the prices of all other commodities remain constant, it induces consumers to substitute the commodity whose price has fallen for other commodities which have now become relatively expensive. The result is that the total demand for the commodity whose price has fallen. This is called the **substitution effect**.

→ **Income effect:** When the price of a commodity falls, the consumer can buy the same quantity of the commodity with less money or he can buy more of the same commodity with the same amount of money. In other words, as a result of the fall in the price of the commodity, consumer's real income or purchasing power increases. **This increase in real income induces him to buy more of that commodity.** Thus, the demand for that commodity (whose price has fallen) increases. This is called the **income effect**.

➤ **Arrival of new consumers:** When the price of a commodity falls, more consumers start buying it because some of those who could not afford to buy it earlier may now be able to buy it. This raises

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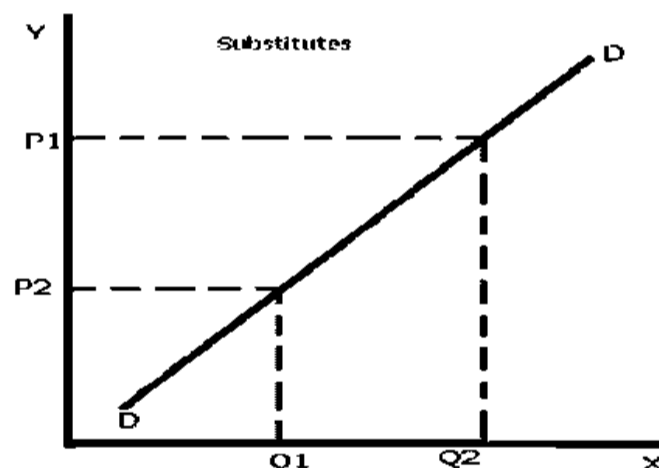
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the number of consumers of a commodity at a lower price and hence the demand for the commodity in question.

➤ **Different uses:** *Certain commodities have multiple uses. If their prices fall, they will be used for varied purposes and therefore their demand for such commodities will increase. When the price of such commodities are high or rises they will be put to limited uses only. Thus, different uses of commodities make the demand curve slope downwards reacting to changes in price. Example: Olive oil can be used for cooking as well as for cosmetic purposes. So, if the price of olive oil rise we can limit our usage and thus the demand will fall.*

Exceptions to the Law of Demand

The law of demand is valid in most cases; however there are certain cases where this law does not hold good. The following are the important exceptions to the law of demand.



➤ **Conspicuous goods:** *Articles of prestige value or snob appeal or articles of conspicuous consumption are demanded only by the rich people and these articles become more attractive if their prices go up. Such articles will not conform to the usual law of demand. This was found out by Veblen in his doctrine of “Conspicuous Consumption” and hence this effect is called the Veblen effect or prestige goods effect. The Veblen effect takes place as some consumers measure the utility of a commodity by its price i.e., if the commodity is expensive, they think that it has got more utility. As such, they buy less of this commodity at low price and more of it at high price. Example: Diamonds Higher the price of diamonds, higher is the prestige value attached to them and hence higher is the demand for them.*

➤ **Giffen Goods:** *Sir Robert Giffen, a Scottish economist and statistician, was surprised to find out that as the price of bread increased, the British workers purchased more bread and not less of it.*

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This was something against the law of demand. The reason given for this is that when the price of bread went up, it caused such a large decline in the purchasing power of the poor people that they were forced to cut down the consumption of meat and other more expensive foods. Since bread, even when its price was higher than before, was still the cheapest food item, people consumed more of and not less when its price went up.

→ Such goods which exhibit direct price-demand relationships are called 'Giffen goods'. Generally those goods which are inferior, with no close substitutes easily available and which occupy a substantial place in the consumer's budget are called 'Giffen goods'.

→ All Giffen goods are inferior goods; but all inferior goods are not Giffen goods. Inferior goods ought to have a close substitute. Moreover, the concept of inferior goods is related to the income of the consumer i.e., the quantity demanded of an inferior good falls as income rises, price remaining constant as against the concept of giffen goods which is related to the price of the product itself. Examples of Giffen goods are coarse grains like bajra, low quality rice and wheat etc.

➤ **Conspicuous necessities:** The demand for certain goods is affected by the demonstration effect of the consumption pattern of a social group to which an individual belongs. These goods, due to their constant usage, become necessities of life. Example: in spite of the fact that the prices of television sets, refrigerators, coolers, cooking gas etc. have been continuously rising, their demand does not show any tendency to fall.

➤ **Future expectations about prices:** It has been observed that when the prices are rising, households expecting that the prices in the future will be higher, tend to buy larger quantities of such commodities. Example: when there is wide-spread drought, people expect that prices of food grains would rise in future. They demand greater quantities of food grains as their prices rise. However, it is to be noted that here it is not the law of demand which is invalidated but there is a change in one of the factors which was held constant while deriving the law of demand, namely change in the price expectations of the people.

➤ **Irrational behaviour of Consumers:** The law has been derived assuming consumers to be rational and knowledgeable about market-conditions. However, at times, consumers tend to be irrational and make impulsive purchases without any rational calculations about the price and usefulness of the product and in such contexts the law of demand fails.

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➤ **Demand for necessities:** The law of demand does not apply much in the case of necessities of life. Irrespective of price changes, people have to consume the minimum quantities of necessary commodities. Similarly, in practice, a household may demand a larger quantity of a commodity even at a higher price because it may be ignorant of the ruling price of the commodity. Under such circumstances, the law will **not remain valid**. Example: Food, power, water, gas.

➤ **Speculative goods:** In the speculative market, particularly in the market for stocks and shares, more will be demanded when the prices are rising and less will be demanded when prices decline.

Expansion and Contraction of Demand

➤ Expansion and contraction of demand means changes in quantity demanded due to change in the price of the commodity, other determinants like income, tastes, etc. remaining constant or unchanged.

Expansion of Demand

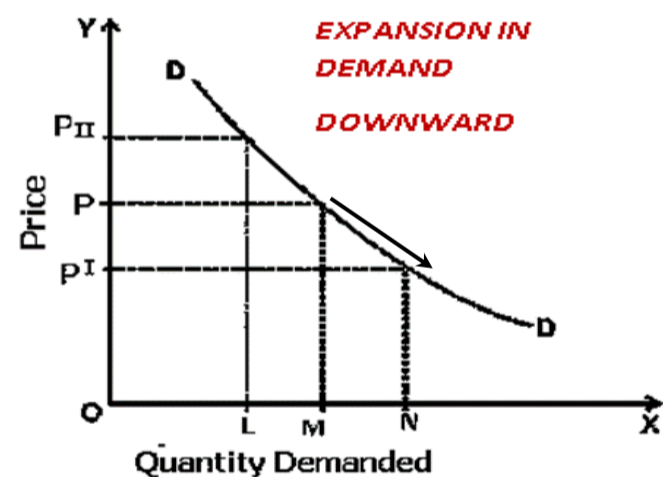
➤ When the price of a commodity falls, its quantity demanded rises. This is called **expansion of demand**.

➤ **In the figure**

→ At price OP quantity demanded is OM .

→ With a fall in price to OP_1 , the quantity demanded rises from OM to ON .

→ The coordinate point moves down from E to E_1 . This is called 'expansion of demand' or 'a rise in quantity demanded' or 'downward movement on the same demand curve'.



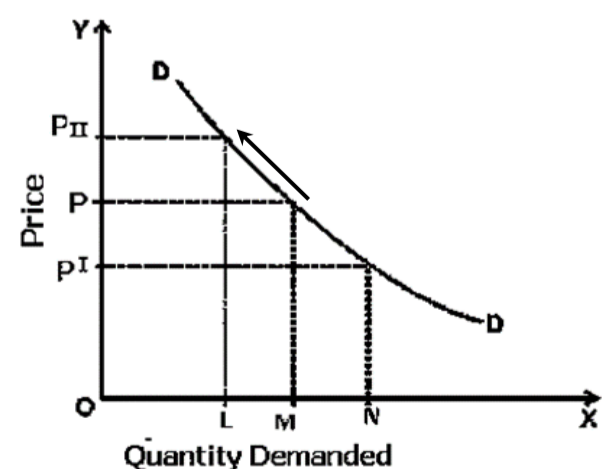
Contraction of Demand

➤ When the price of a commodity rises, its quantity demanded falls. This is called **contraction of demand**.

➤ **In the figure**

→ At price OP quantity demanded is OM .

→ With a rise in price to P_2 , the quantity demanded falls from OM to OL . The coordinate point moves up from E to E_2 .



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→ This is called 'contraction of demand' or 'a fall in quantity demanded' or 'upward movement on the same demand curve'.

Shift In Demand Curve

Decrease in Demand Curve

➤ When there is change in demand due to change in factors other than price of the commodity, it is called **decrease in demand**.

➤ It is the result of change in consumer's income, tastes and preferences, changes in population, changes in the distribution of income, etc.

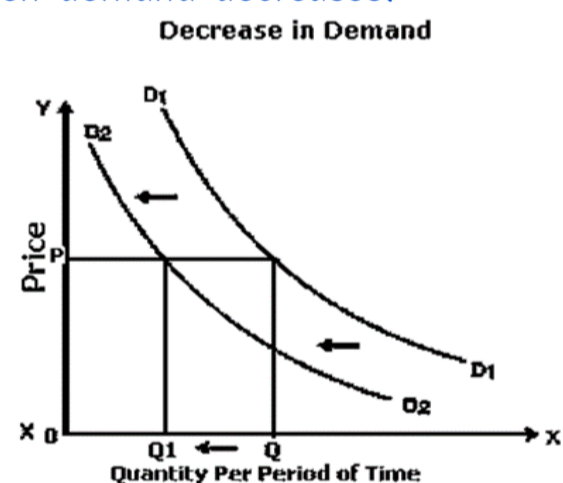
➤ Price remains the same when demand falls due to change in factors other than price, it is called decrease in demand. Here, less quantity is purchased at the same price or same quantity is purchased at lower price.

➤ Demand curve shifts from its original position to leftward when demand decreases.

➤ **In the figure**

→ Original demand curve is D_1 . At OP price OQ quantity is being demanded.

→ At D_2 , OQ_1 quantity is being demanded at the price OP . This shows a decrease in demand (leftward shift in demand curve) due to a factor other than price.



Increase in Demand Curve

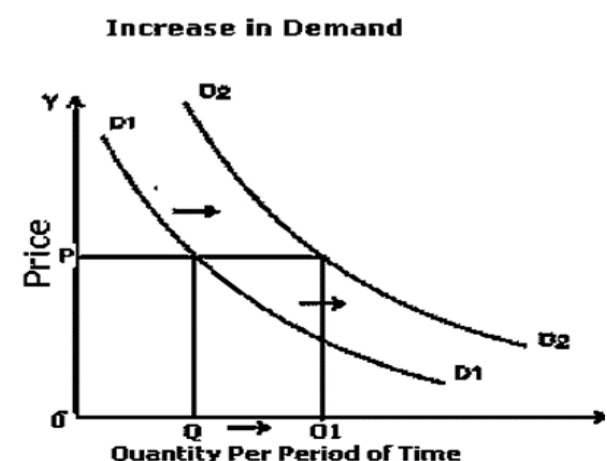
➤ Price remains the same when demand rises due to change in factors other than price, it is called **Increase in demand**. Here, more quantity is purchased at the same price or the same quantity is purchased at a higher price.

➤ Demand curve shifts from its original position to rightward when demand increases.

➤ **In the figure**

→ Original demand curve is D_1 . At OP price OQ quantity is being demanded.

→ At D_2 , OQ_1 quantity is being demanded at the price OP . This shows an increase in demand (rightward shift in demand curve) due to factors other than price.



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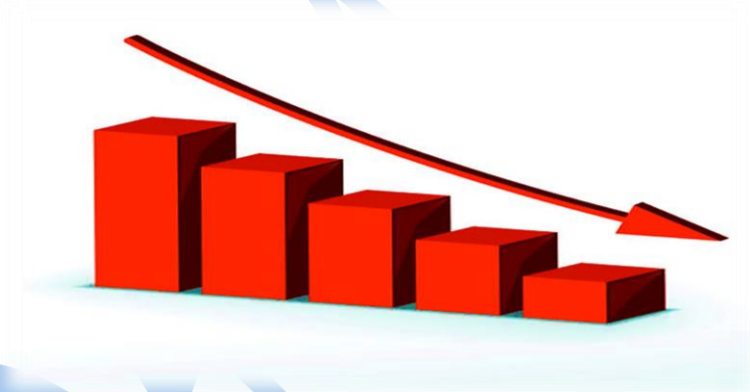
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Elasticity of Demand

Definition Elasticity of Demand: → Elasticity of demand is defined as the responsiveness of the quantity demanded of a good to changes in one of the variables on which demand depends.

→ More precisely, elasticity of demand is the percentage change in quantity demanded divided by the percentage change in one of the variables on which demand depends.

→ These variables are price of the commodity, prices of the related commodities, income of the consumers and other factors on which demand depends. Thus, we have price elasticity, cross elasticity, income elasticity, advertisement elasticity and elasticity of substitution. It is price elasticity of demand which is usually referred to as elasticity of demand.



Price Elasticity

Price elasticity measures the degree of responsiveness of quantity demanded of a commodity to a change in its price, given the consumer's income, his tastes and prices of all other goods. It reflects how sensitive buyers are to change in price.

Price elasticity of demand can be defined as a ratio of the percentage change in the quantity demanded of a commodity to the percentage change in its own price.

It may be expressed as follows:

$$E_p = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

➤ Since price and quantity demanded are inversely related, the value of price elasticity coefficient will always be negative. But for the value of elasticity coefficients we ignore the negative sign and consider the numerical value only.

The degrees/ types of price elasticity of demand

Price elasticity measures the degree of responsiveness of quantity demanded of a commodity to a change in its price. Depending upon the degree of responsiveness of the quantity demanded to the price changes, we can have the following kinds of price elasticity of demand.

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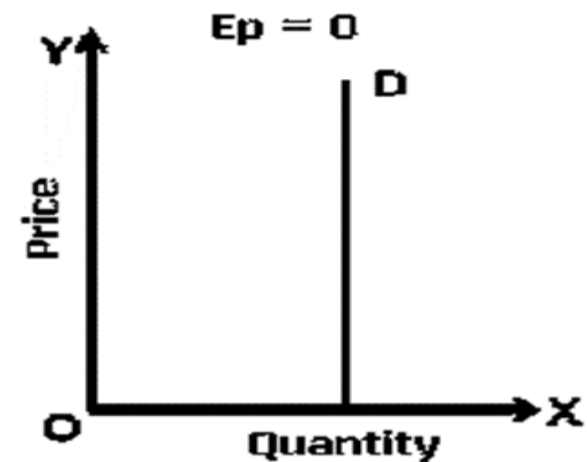
1. Perfectly Inelastic Demand ($E_p = 0$):

→ When change in price has no effect on quantity demanded, then demand is **perfectly inelastic**.

→ Example: If price falls by 20% and the quantity demanded remains unchanged then, $EP = \frac{0}{20} = 0$.

→ The demand curve is a vertical straight line curve parallel to the y-axis.

→ Whatever the price, quantity demanded of the commodity remains unchanged at OD.

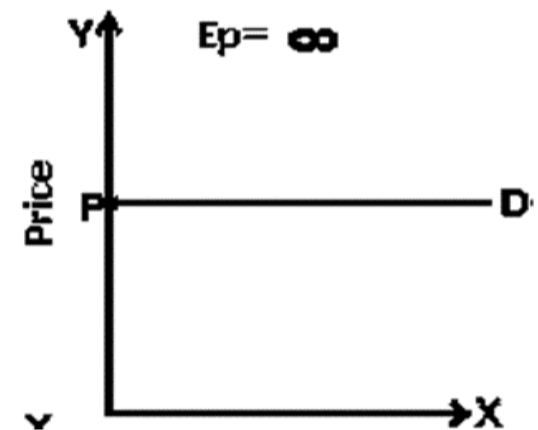


2. Perfectly Elastic Demand ($E_p = \infty$):

→ When with no change in price or with very little change in price, the demand for a commodity expands or contracts to any extent, The demand is said to be **perfectly elastic**.

→ The demand curve is horizontal and parallel to the X-axis.

→ The figure shows that demand curve DD is parallel to X-axis which means that at a given price, demand is ever increasing.

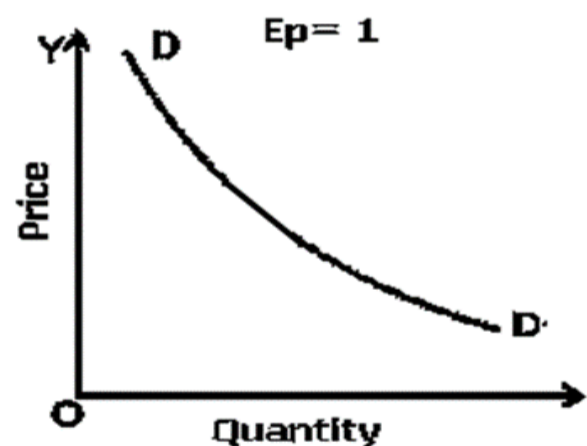


3. Unit Elastic Demand ($E = 1$):

→ When the percentage change in price is equal to the percentage change in quantity demanded, then the demand is said to be **unit elastic**.

→ Example: If price falls by 10% and the demand rises by 10% then $EP = \frac{10}{10} = 1$.

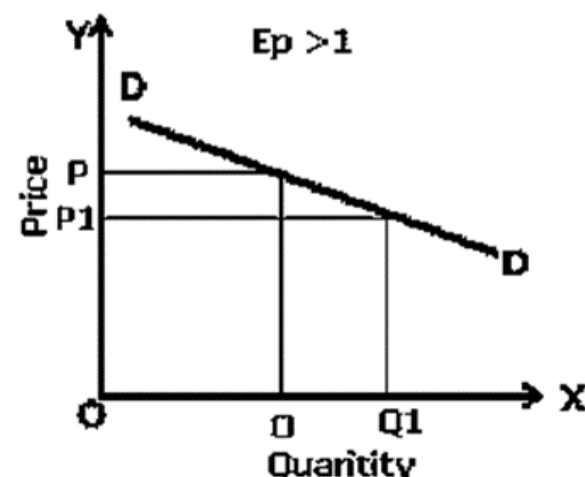
→ Demand Curve DD is a rectangular hyperbola curve suggesting unitary elastic demand.



4. Relatively Elastic Demand ($E_p > 1$):

→ When a small change in price leads to more than proportionate change in quantity demanded then the demand is said to be **relatively elastic**.

→ The coefficient of price elasticity would be somewhere between ONE and INFINITY. The elastic demand curve



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is flatter.

→ Demand curve DD is flat suggesting that

The demand is relatively elastic or highly elastic.

→ Relatively elastic demand occurs in case of less urgent wants or if the expenditure on commodity is large or if close substitutes are available.

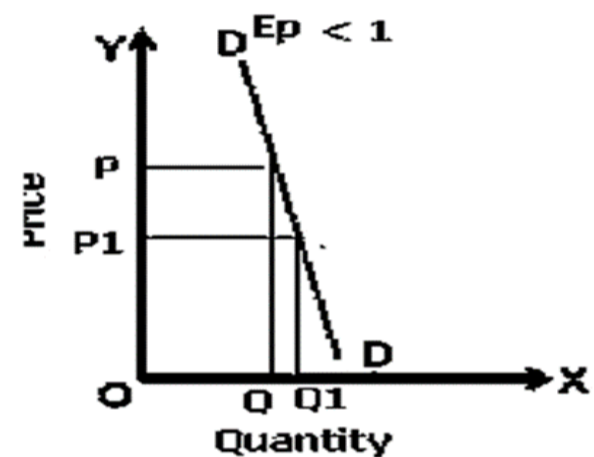
5. Relatively Inelastic Demand ($E_p < 1$):

→ When a big change in price leads to less than proportionate change in quantity demanded, then the demand is said to be **relatively inelastic**.

→ The coefficient of price elasticity is somewhere between ZERO and ONE. The demand curve in this case has a steep slope.

→ Demand curve DD is steeper suggesting that demand is less elastic or relatively inelastic.

→ Relatively inelastic demand occurs in case of compulsory goods i.e., necessities of life.



Measurement of price elasticity of demand

Price Elasticity: Price elasticity of demand expresses the response of quantity demanded of a good to a change in its price, given the consumer's income, his tastes and prices of all other goods. There are four methods of measuring the elasticity of demand. The most popular is what is known as the Marshallian method or percentage method.

Percentage Method Of Marshall

→ This method is based on the definition of elasticity of demand. The coefficient of price elasticity of demand is measured by taking the ratio of percentage change in demand to the percentage change in price.

→ Price Elasticity = $E_p = \frac{\% \text{ Change in Quantity Demanded}}{\% \text{ Change in Price}}$

→ $E_p = \frac{\Delta q}{q} \times \frac{p}{\Delta p} = \frac{\Delta q}{\Delta p} = \frac{p}{q}$

Where—

Δq = Change in quantity demanded

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q = Original quantity demanded

Δp = change in price

p = Original price

→ Price elasticity varies from minus infinity to approach zero from the negative sign, because $\frac{-\Delta q}{\Delta p}$ has a negative sign. In other words, since price and quantity are inversely related with a few exceptions, price elasticity is negative. But for the sake of convenience, we ignore the negative sign and consider only the numerical value of the elasticity.

The Total Outlay or Expenditure Method or Seller's Total Revenue Method

→ The total outlay refers to the total expenditure done by a consumer on the purchase of a commodity. It is obtained by multiplying the price with the quantity demanded.

→ Thus, **Total Outlay (TO) = Price (P) × Quantity (Q)** ($TO = P \times Q$)

→ In this method, we measure price elasticity by examining the change in total outlay due to change in price. **Dr. Alfred Marshall** laid the following propositions:

Price per Unit (₹)	Quantity Demanded	Total Outlay (P × Q)	Elasticity of Demand
10	10	100	$E_p = 1$
5	20	100	Unitary
10	10	100	$E_p > 1$
5	30	150	Elastic
10	10	100	$E_p \leq 1$
5	17	85	Inelastic

- When with the change in price, the TO remains unchanged, $E_p = 1$.
- When with a rise in price, the TO falls or with a fall in price, the TO rises, $E_p > 1$.
- When with a rise in price, the TO also rises and with a fall in price, the TO also falls, $E_p < 1$.

→ However, the total outlay method of measuring price elasticity is less exact. This method only classifies elasticity into elastic, inelastic and unit elastic. The exact and precise coefficient of elasticity cannot be found out with this method.

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Point Method or Geometric Method

→ The point elasticity method measures elasticity at a given point on a demand curve.

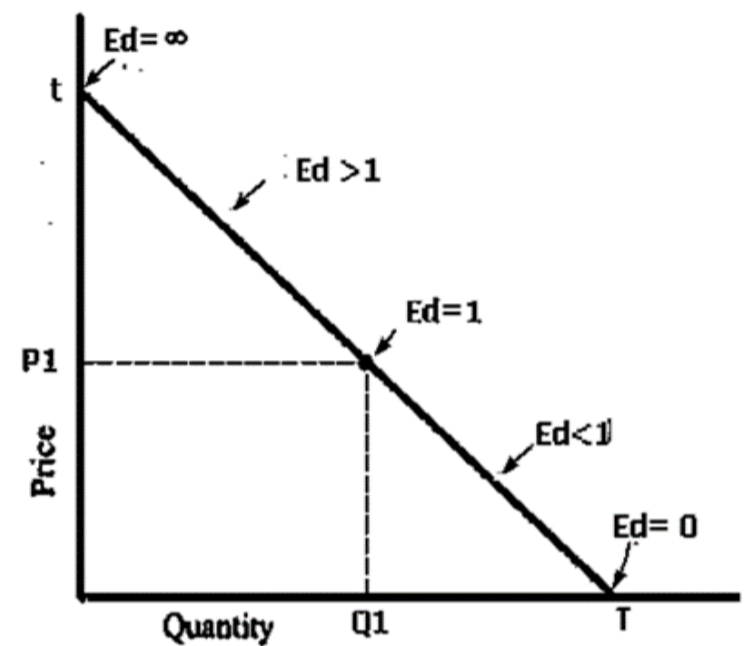
→ This method is useful when changes in price and quantity demanded are very small (infinitesimal) so that they can be considered one and the same point only.

→ In such a situation, measure elasticity at a point on demand curve by using formula

$$\frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

→ Diagrammatically also find elasticity at a point by using the formula

$$EP = \frac{\text{Lower Segment of the Demand Curve}}{\text{Upper Segment of the Demand Curve}}$$



→ The figure shows that even though the shape of the demand curve is constant, the elasticity is different at different points on the curve.

→ If the demand curve is not a straight line curve, then in order to measure elasticity at a point on demand curve we have to draw tangent at the given point and then measure elasticity using the above formula. We can also find out numerical elasticities on different points.

Arc Elasticity Method

→ When there is a large change in the price or we have to measure elasticity over an arc of the demand curve, Use the "arc method" to measure price elasticity of demand.

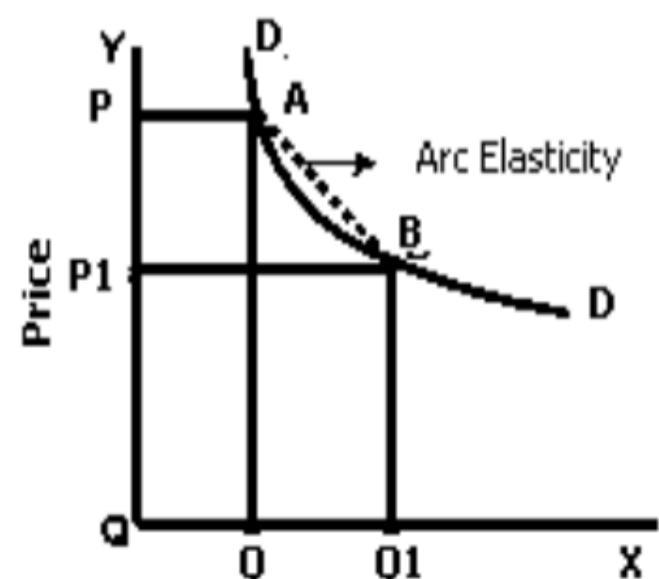
→ The arc elasticity is a measure of the "average elasticity" i.e., elasticity at MIDPOINT that connects the two points on the demand curve.

→ Thus, an arc is a portion of a curved line, hence a portion of a demand curve. Here instead of using original or new data as the basis of measurement, we use the average of the two.

→ The formula $EP = \frac{q1 - q2}{q1 + q2} \times \frac{p1 + p2}{p1 - p2}$

Where, $P1$ & $q1$ = Original price and quantity

$p2$ & $q2$ = new price and quantity



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Determinants of Price Elasticity of Demand

➤ **Availability of substitutes** → One of the most important determinants of elasticity is the degree of availability of close substitutes. Example: Butter, cabbage, Maruti Car, Coca Cola, etc. having close substitutes, 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. Example: 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, goods which typically have close or perfect substitutes have highly elastic demand curves.

Moreover, the wider the range of substitutes available, the greater will be the elasticity.

→ It should be noted that while as a group, a good or service may have **inelastic demand**, when we consider its various brands, we say that a particular brand has **elastic demand**. Example: 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.

➤ **Position of a commodity in a 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 clothing tends to be elastic since households generally spend a good part of their income on clothing.

➤ **Nature of the need that a commodity satisfies** In general, *luxury goods are price elastic while necessities are price inelastic*. Thus, while the demand for television 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.

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➤ **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. Example: milk has several uses. If its price falls, it can be used for a variety of purposes: 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. Example: 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 adjustment to higher prices.*

➤ **Consumer habits** *If a consumer is a habitual consumer of a commodity, no matter how much its price change, the demand for the commodity will be 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. 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*

➤ **Relevance for Business Managers** *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. 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 other hand, if demand were relatively inelastic, the firm may safely increase the price and thereby increase its total revenue as they know that the fall in sales would be less than proportionate.*

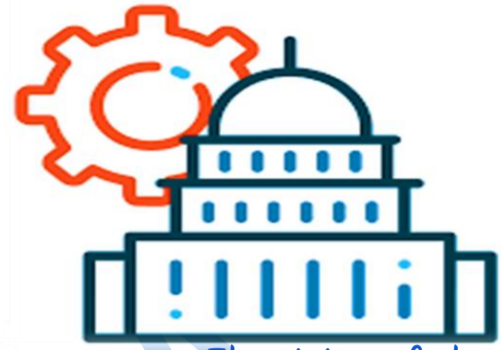


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➤ **Relevance for Governments** Knowledge of price elasticity of demand is important for governments while determining the prices of goods and services provided by them, such as, transport and telecommunication. Further, it also helps the governments to understand the nature of responsiveness of demand to the increase in prices on account of additional taxes and the implications of such responses on the tax revenues. Elasticity of demand explains why Governments are inclined to raise the indirect taxes on those goods that have a relatively inelastic demand, Example: alcohol and tobacco products.



Income Elasticity of Demand

→ The income elasticity of demand measures the degree of responsiveness of quantity demanded to changes in income of the consumers. The income elasticity is defined as a ratio of percentage change in the quantity demanded to the percentage change in income.

→ Income Elasticity = $\frac{\% \text{Change in Quantity Demanded}}{\% \text{Change in Income}}$ Symbolically, $EY = \frac{\Delta q}{\Delta y} \times \frac{y}{q}$

→ Where, ΔQ & ΔY denote new quantity & income.

Q & Y denote original quantity & income.

→ The income elasticity of demand is **positive for all normal or luxury goods** and the income elasticity of demand is **negative for inferior goods**.

→ Income elasticity can be classified under five heads:-



➤ Zero Income Elasticity

→ It means that a given increase in income does not at all lead to any increase in quantity demanded of the commodity. In other words, demand for the commodity is completely income inelastic or $E = 0$.

→ Commodities having zero income elasticity are called Neutral goods.

→ **Example:** Demand in case of Salt, Match box, Postcards, etc.

➤ Negative Income Elasticity

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→It means that an increase in income results in a fall in the quantity demanded of the commodity or $E_y < 0$. *Commodities having negative income elasticity are called Inferior goods. Example: Jawar, Bajra, etc.*

➤ Unitary Income Elasticity

→It means that the proportion of consumer's income spent on the commodity remains unchanged before and after the increase in income or $E_s = 1$. This represents a *useful dividing line*.

➤ Income Elasticity Greater Than Unity

→It refers to a situation where the consumer spends a great proportion of his income on a commodity when he becomes richer. $E_y > 1$, Example: In the case of luxuries like cars, TV. sets, music system, etc.

➤ Income Elasticity Less Than Unity:

→It refers to a situation where the consumer spends a smaller proportion of his income on a commodity when he becomes richer. $E_y < 1$, Example: In the case of Necessities like rice, wheat, etc.

Knowledge of income elasticity of demand is very useful for a business firm in estimating future demand for its products. Knowledge of income elasticity of demand helps firms predict the outcome of a business cycle on its market demand. This enables the firm to carry out appropriate production planning and management

Cross Elasticity of Demand

Many times demand for two goods are related to each other. Therefore, when the price of a particular commodity changes, the demand for other commodities changes, even though their own prices have not changed. We measure this change under cross elasticity. The cross elasticity of demand can be defined as the *degree of responsiveness of demand for a commodity to a given change in the price of some related commodity* or as the ratio of percentage change in quantity demanded of commodity X to a given percentage change in the price of the related commodity Y.

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$$EC = \frac{\% \text{ Change in Demand of } X}{\% \text{ Change in the Price of } Y} \quad \text{Symbolic, } EC = \frac{\Delta q_x}{\Delta p_y} \times \frac{p_y}{p_x}$$

Where, E_c = cross elasticity

q_x = Original quantity of X which is demanded

p_y = Original price of Y

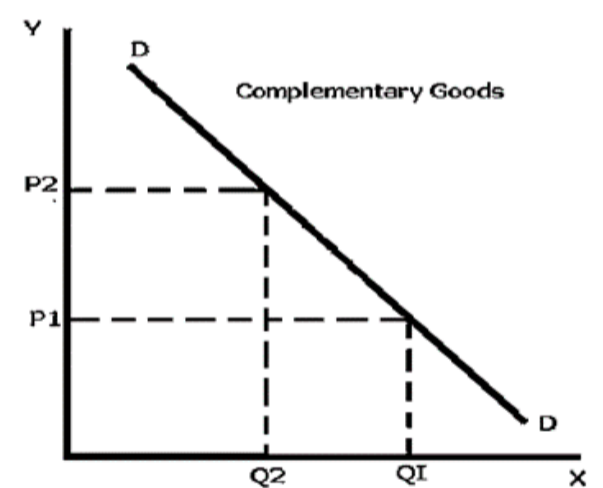
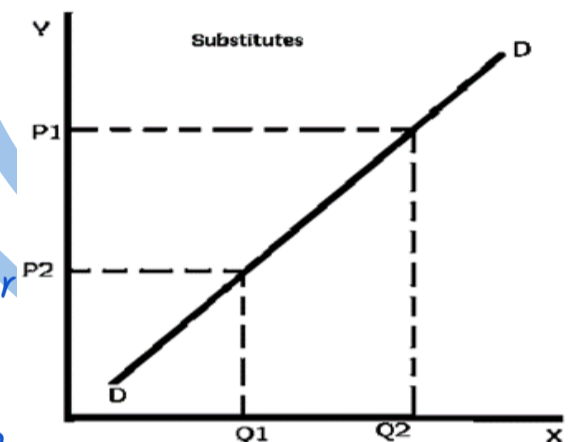
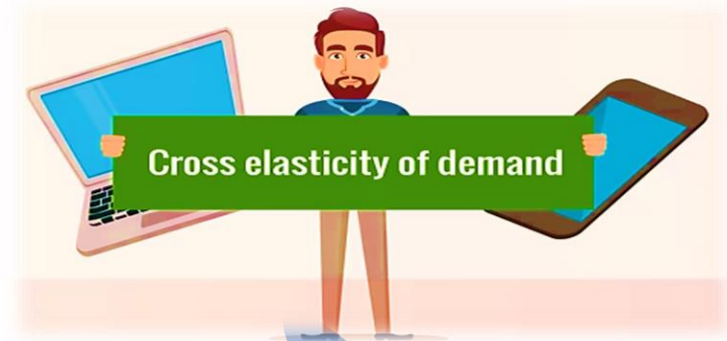
Δ = denotes change.

➤ **Cross elasticity of demand can be used to classify goods as follows:-**

→ **Substitute Goods:** Example: Tea and Coffee. The cross elasticity between two substitutes is always positive. 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. If cross elasticity is infinite, the two goods are perfect substitutes and if it is greater than zero but less than infinity, the goods are substitutes.

➤ **Independent Goods:** Example: Pastry and Scooter. The two commodities are not related. The cross elasticity in such cases is Zero.

➤ **Complementary Goods:** Example: Petrol and Car. If the price of petrol rises, its demand falls and along with it demand for cars also falls. The cross elasticity in such cases is Negative. In the case of complementary goods, as shown in the figure 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. Higher the negative cross elasticity, higher will be the extent of complementarity.



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

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Advertisement Elasticity

→ Demand for many goods is also influenced by advertisement or promotional efforts. It means that the demand for a good is responsive to the advertisement expenditure incurred by a firm.

→ The measurement of the degree of responsiveness of demand of a good to a given change in advertisement expenditure is called *advertisement or promotional elasticity of demand*. It measures the percentage change in demand to give one percentage change in advertising expenditure. It helps a firm to know the effectiveness of its advertisement campaign.

→ Advertisement elasticity of demand is positive. Higher the value, higher is change in demand to change in advertisement expenditure.

$$\rightarrow EA = \frac{\% \text{ Change in Demand}}{\% \text{ Change in Advertisement Expenditure}} \quad \text{Symbolic, } EA = \frac{\Delta Q}{\Delta A} \times \frac{A}{Q}$$

Where,

A = advertisement expenditure

Q = quantity demanded

Δ = change

→ The value of advertisement elasticity varies between zero and infinity. If-

1. $Ea = 0$, no change in demand to increase in advertisement expenditure
2. $Ea > 0$ but < 1 , less than proportionate change in demand to a change in advertisement expenditure
3. $Ea = 1$, change in demand is equal to change in advertisement expenditure
4. $Ea > 1$, higher rate of change in demand than change in advertisement expenditure.



Demand Forecasting

➤ **Meaning:** 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.

It should be kept in mind that demand forecasting is no simple guessing, but it refers to estimating demand scientifically and objectively on the basis of certain facts and events relevant to forecasting.



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→Demand forecasting is an important function of managers as it **reduces uncertainty** of the environment in which decisions are made. Further, it helps in **Planning for future levels of production**.

→Its significance can be stated as follows:

- i. Good forecasts help in efficient production planning, process selection, capacity planning, facility layout and inventory management.
- ii. A firm can plan production scheduling well in advance and obtain all necessary resources for production such as inputs, and finances.
- iii. 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.
- iv. Marketing relies on sales forecasting in making key decisions. Demand forecasts also provide the necessary information for formulation of suitable pricing and advertising strategies.

Scope of Demand Forecasting

- i. Demand forecasting can be at the international level depending upon the area of operation of the given economic institutions.
- ii. It can also be confined to a given product or service supplied by a small firm in a local area.
- iii. 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.
- iv. Much would depend upon the cost and time involved in relation to the benefits 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 owing from such forecasting.

Types of Forecasts

→**Macro-level forecasting** It 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.

→**Industry-level forecasting** It is concerned with the demand for the industry's products as a whole. For example, demand for cement in India.

→**Firm-level Forecasting** It refers to forecasting the demand for a particular firm's product, say, the demand for ACC cement.

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→ **Short-term demand forecasting** It covers a short span of time, depending on the nature of industry. It is done usually for six months or less than one year and is generally useful in tactical decisions.

→ **Long-term forecasts** These 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.

Demand Distinction

A. Producers goods and Consumer's goods: *Producer's goods are those which are used for the production of other goods- either consumer goods or produce goods themselves. Example: goods are machines, locomotives, ships etc. Consumer's goods are those which are used for final consumption. Examples of consumer's goods can be ready-made clothes, prepared food, residential houses, etc.*

B. Durable goods and Non-durable goods: *Consumer's goods may be further subdivided into durable and non-durable goods. The non-durable consumer goods are those which cannot be consumed more than once; Example: bread, milk etc. These will meet only the current demand. On the other hand, durable consumer goods are those which can be consumed more than once over a period of time, Example: a car, a refrigerator, a ready-made shirt, and an umbrella. The demand for durable goods is likely to be a derived demand.*

C. Derived demand and Autonomous demand: *When a product is demanded consequent on the purchase of a parent product, its demand is called derived demand. Example: the demand for cement is derived from demand, being directly related to building activity. If the demand for a product is independent of demand for other goods, then it is called autonomous demand. But this distinction is purely arbitrary and it is very difficult to find out which product is entirely independent of other products.*

D. Industry demand and Company demand: *The term industry demand is used to denote the total demand for the products of a particular industry, Example: the total demand for steel in the country. On the other hand, the term company demand denotes the demand for the products of a particular company, Example: demand for steel produced by the Tata Iron and Steel Company.*

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E. Short—run demand and Long-run demand: Short run demand refers to demand with its immediate reaction to price changes, income fluctuations, etc., whereas long-run demand is that which will ultimately exist as a result of the changes in pricing, promotion or product improvement, after enough time is allowed to let the market adjust to the new situation. 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 use electric appliances.

Analysis of Demand Specific Factors

➤ Factors affecting demand of non-durable consumer goods

→ **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.

→ **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.

→ **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.

➤ Factors affecting demand of durable-consumer goods

→ **Postponement of demand** 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.

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→ **Special facilities** 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

→ **Impact of Households** 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.

→ **Replacement demand** 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.

→ **Prices and Credit availability** Demand for consumer durables is very much influenced by their prices and credit facilities available to buy them like hire purchase, low interest rates, etc. available to buy them. The easy credit facilities are higher is the demand for goods like two wheelers, cars, TVs. etc.

➤ Factors affecting demand of producer goods

→ **Derived Demand** 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 the 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.

→ **Change in price of other factors of production** 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

→ **Profit making Prospects** 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 good

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- **Technological Changes** 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
- **Interest rates** 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.

Methods of Demand Forecasting

The firm has to apply a proper mix of judgement and scientific formulae in order to correctly predict the future demand for a product. The following are the commonly available techniques of demand forecasting:

➤ **Survey of Buyers' Intentions:** In this method, customers are asked what they are planning to buy for the forthcoming time period, usually a year. This method involves the use of conducting direct interviews or mailing questionnaires asking customers about their intentions or plans to buy the product. The survey may be conducted by any of the following methods:

- **Complete Enumeration** where all potential customers of a product are interviewed about what they are planning or intending to buy in future. It is a cumbersome, costly and time consuming method.
- **Sample Survey** where only a few customers are selected and interviewed about their future plans. It is a less cumbersome and less costly method.
- **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.

→ **Drawbacks of this method**

Thus, under this method the burden of forecasting is put on the customers. 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

→ **Suitability of this Method**

This method is useful for short-term forecasts. 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

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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.

➤ **Statistical Method** Statistical methods have proved to be very useful in demand forecasting. Statistical methods are superior, more scientific, reliable and free from subjectivity. The important statistical methods of demand forecasting are:

1. Trend Projection Method: The method is also known as Classical Method. It is considered as a 'naive' approach to demand forecasting. Under this, data on sales over a period of time is chronologically arranged to get a 'time series'. The time series shows the past sales pattern. It is assumed that the past sales pattern will continue in the future also. The techniques of trend projection based on time series data are Graphical Method and Fitting trend equation of Least Square Method.

2. Graphical Method: This is the simplest technique to determine the trend. Under this method, all values of sales for different years are plotted and a free hand curve is drawn passing through as many points as possible. The direction of the free hand curve shows the trend. The main drawback of this method is that it may show a trend but not measure it.

3. Fitting Trend Equation/Least Square Method: This method is based on the assumption that the past rate of change will continue in the future. It is a mathematical procedure for fitting a time to a set of observed data points in such a way that the sum of the squared deviation between the calculated and observed values 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 dependent variable in the future. This method is very popular because it is simple and inexpensive. Moreover, the trend method provides fairly reliable estimates of future demand.

Assumption:- 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.

Limitation:- The major limitation of this method is that it cannot be used where the trend is cyclical with sharp turning points of troughs and peaks. Also, this method cannot be used for short term forecasts.

4. Regression Analysis: This is a very common method of forecasting demand. Under this method, a quantitative relationship is established between quantity demanded (dependent variable) and the

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independent variables like income, price of goods, price of related goods, etc. Based on this relationship, an estimate is made for future demand. It can be expressed as follows-

$$Y = a + b X$$

Where, X, Y are variables a, b are constants 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.

➤ **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 the 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 a 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.

Suitability:- The method of controlled experiments is used relatively less because this the method of demand forecasting is expensive as well as time consuming.

Limitations:- 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

➤ **Barometric Method of forecasting** 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

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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 a basis for forecasting the likely economic environment in the near future. There are leading indicators, coincident 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. 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. The coincident indicators, however, move up and down simultaneously with the level of economic activities. For example, the rate of unemployment.

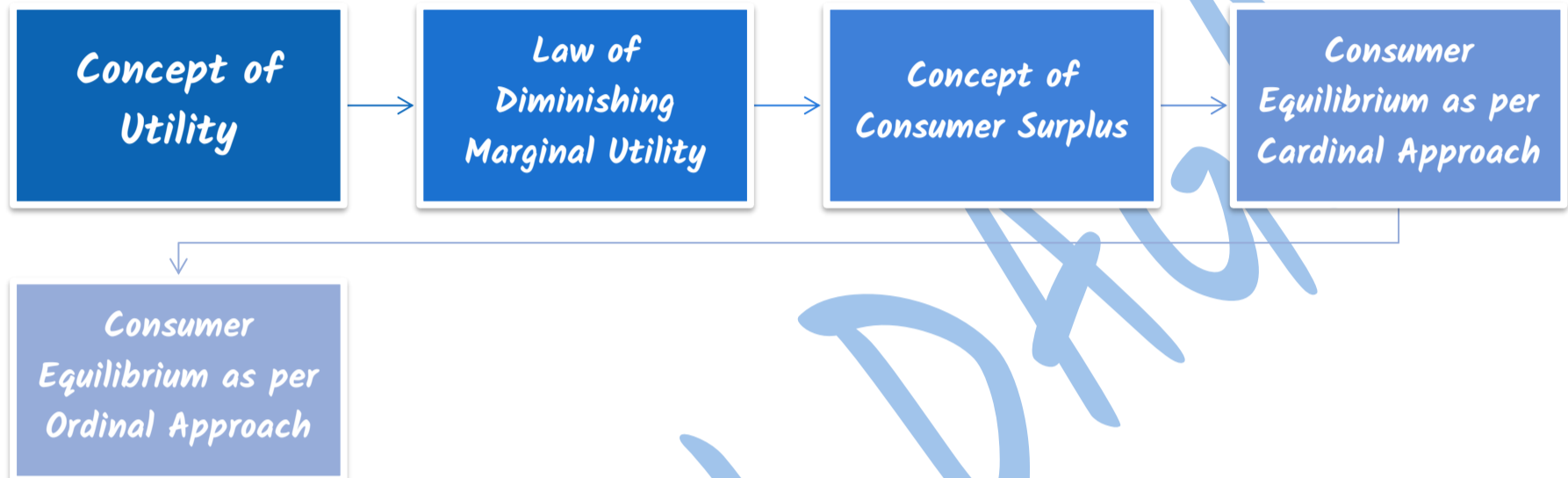
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Unit 2: Theory of Consumer Behaviour

Overview



Meaning of WANTS in Economics

All desires, tastes and motives of human beings are called wants in Economics. Wants may arise due to elementary and psychological causes. Since the resources are limited, we have to choose between the urgent wants and the not so urgent wants.



Features of WANTS in Economics

All wants of human beings manifest some characteristic features:-

01. Wants are **unlimited in number**. They are never completely satisfied.
02. Wants **differ in intensity**. Some are urgent, others are felt less intensely.
03. Each want is **satiabile**.
04. Wants are **competitive**. They compete with each other for satisfaction because resources are scarce to satisfy all wants.
05. Wants are **complementary**. Some wants can be satisfied only by using more than one good or group of goods.
06. Wants are **alternatives**.
07. Wants are **subjective and relative**.
08. Wants **vary with time, place, and person**.
09. Some want to recur again whereas others do not occur again and again.

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10. Wants may become *habits and customs*.
11. Wants are affected by income, taste, fashion, advertisements and social customs.
12. Wants arise from multiple causes such as natural instincts, social obligation and individual's economic and social status

Classification of 'Wants'

In Economics, wants are classified into three categories, viz., necessities, comforts and luxuries.

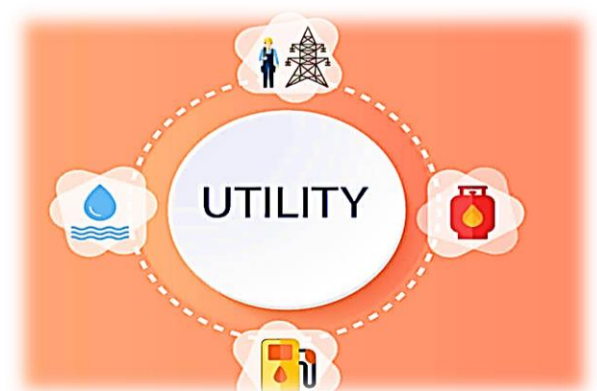
Necessaries	<p><i>Necessaries are those which are essential for living. Necessaries are further sub-divided into:</i></p> <ol style="list-style-type: none"> A. <u>Necessities for life</u>: are things necessary to meet the minimum physiological needs for the maintenance of life. Example: minimum amount of food, clothing and shelter. B. <u>Necessaries for Efficiency</u>: Man requires something more than the necessities of life to maintain longevity, energy and efficiency of work. Example: nourishing food, adequate clothing, clean water, comfortable dwelling, education, recreation etc. These are necessary for efficiency. C. <u>Conventional necessities</u>: arise either due to pressure of habit or due to compelling social customs and conventions. They are not necessary either for existence or for efficiency.
Comforts	<p>While necessities make life possible, comforts make life comfortable and satisfying. <i>Comforts are less urgent than necessary.</i></p> <p>Example: Tasty and wholesome food, good house, audio-visual.</p>
Luxuries	<p>Luxuries are those wants which are superfluous and expensive. They are not essential for living.</p>

The above categorization is not rigid as a thing which is a comfort or luxury for one person or at one point of time may become a necessity for another person or at another point of time.

Meaning of Utility

Utility is the satisfying power of a commodity. It is the expected satisfaction to a consumer when he is willing to spend money on a stock of commodity which has the capacity to satisfy his want.

Utility is the anticipated satisfaction by the consumer, and satisfaction



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is the actual satisfaction derived. A commodity has utility for a consumer even when it is not consumed.

Features of Utility

→ It is a **subjective entity** and varies from person to person. A commodity has different utility for the same person at different places or at different points of time.

→ Utility compared with Usefulness: It should be noted that **utility is not the same thing as usefulness**. From the economic standpoint, even harmful things like liquor, may be said to have utility because people want them. Thus, in Economics, **the concept of utility is ethically neutral**.

Various Approaches to utility

From time to time, different theories have been advanced to explain consumer behaviour and thus to explain his demand for the product. Two important theories are:

- (i) Marginal Utility Analysis propounded by Marshall, and
- (ii) Indifference Curve Analysis propounded by Hicks and Allen.

Cardinal Approach of Utility Analysis

This theory, which is pronounced **Alfred Marshall**, a British economist, seeks to explain how a consumer spends his income on different goods and services so as to attain maximum satisfaction.

Concept of Total Utility and Marginal Utility

➤ **Total Utility**: Assuming that utility is measurable and additive, total utility may be defined as **the sum of utility derived from different units of a commodity consumed by a consumer**.

→ Total utility is the sum of marginal utilities derived from the consumption of different units i.e.

$TU = MU_1 + MU_2 + \dots + MU_n$ Where MU_1, MU_2, \dots, MU_n etc are marginal utilities of the successive units of a commodity.

➤ **Marginal Utility**: It is the addition made to total utility by the consumption of an additional unit of a commodity. It is the **additional utility derived from an additional unit of a commodity**.

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→Symbolically, $MU_n = TU_n - TU_{n-1}$

→Where,

MU_n is the marginal utility of the n th unit

TU_n is the total utility of the n th unit, and

TU_{n-1} is the total utility of the $(n-1)$ th unit.

Assumption of Cardinal Approach

Rationality	A consumer is rational and attempts to attain maximum satisfaction from his limited money income.
Cardinal Measurability of Utility	Utility is a cardinal concept i.e., utility is a measurable and quantifiable concept. Example: a person can say that he derives utility equal to 10 units from the consumption of 1 unit of commodity A and 5 from the consumption of 1 unit of commodity B. Since, he can express his satisfaction quantitatively, he can easily compare different commodities and express which commodity gives him more utility or satisfaction and by how much compared to some other commodity. Money is the measuring rod of utility. The amount of money which a person is prepared to pay for a unit of a good, rather than go without it, is a measure of the utility which he derives from the good.
Constancy of the Marginal Utility of Money	The <u>marginal utility of money remains constant throughout when the individual is spending money on a good.</u> This assumption although not realistic, has been made in order to facilitate the measurement of utility of commodities in terms of money. The <u>marginal utility of money changes as income changes, the measuring-rod of utility becomes unstable and therefore would be inappropriate for measurement.</u>
Hypothesis of Independent Utility	The total utility which a person gets from the whole collection of goods purchased by him is simply the sum total of the separate utilities of the goods. The theory ignores complementarity between goods.

Law of Diminishing Marginal Utility

Marshall, who was the exponent of the marginal utility analysis, stated the law as "The additional benefit which a person derives from a given increase in the stock of a thing diminishes with every increase in the stock that he already has." In other words, as a consumer increases the consumption

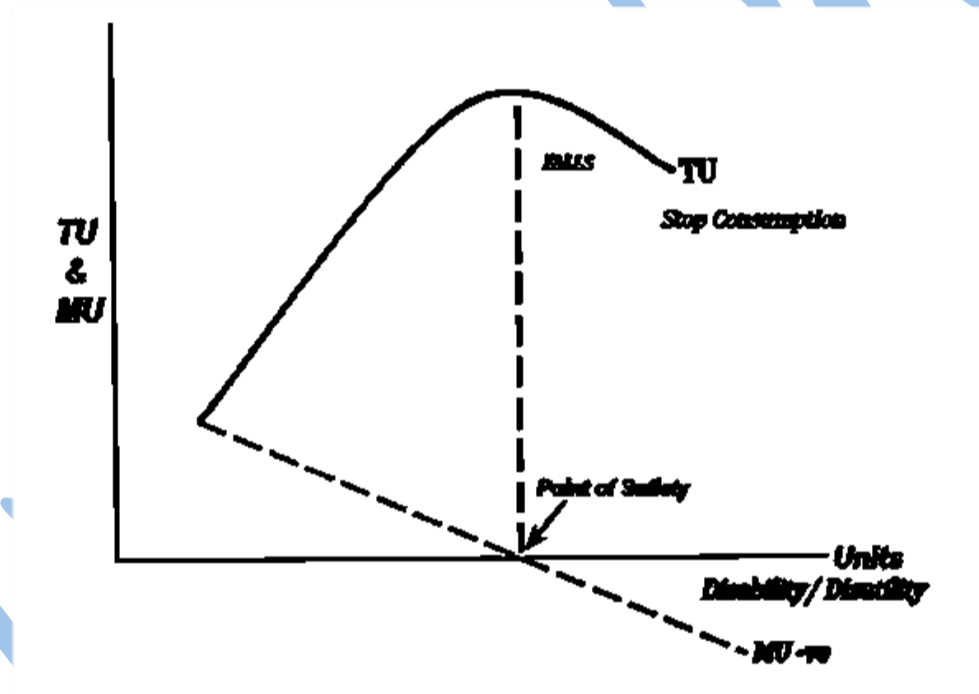
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of any commodity keeping constant the consumption of all other commodities, the marginal utility of the variable commodities must eventually decline. It is the marginal utility and not the total utility which declines with the increase in the consumption of a good.

Statement of the law: The law of diminishing marginal utility is based on an important fact that while total wants of a person are virtually unlimited, **each single want is satiable** i.e., each want is capable of being satisfied. Since each want is satiable, as a consumer consumes more and more units of a good, the intensity of his want for the good goes on decreasing and a point is reached where the consumers no longer want it. Thus, the greater the amount of a good a consumer has, the less an additional unit is worth to him or her.



Relationship between Total Utility(TU) and Marginal Utility(MU)

- Total utility rises as long as MU is positive, but at a diminishing rate because MU is diminishing.
- Marginal utility diminishes throughout.
- When marginal utility is zero, total utility is maximum. It is a saturation point.
- When marginal utility is negative, total utility is diminishing
- MU is the rate of change of TU or the slope of TU.
- MU can be positive, zero or negative.

Exceptions to this LAW

In some cases a consumer gets increasing marginal utility with the increase in consumption.

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- **Hobbies and Rare Collections:** The law does not hold good in case of hobbies and rare collections. Example: reading, collection of stamps, coins, etc. Every additional unit gives more satisfaction i.e., the marginal utility tends to increase.
- **Abnormal Persons:** The law does not apply to abnormal persons. Example: misers, drunkards, musicians, drug addicts, etc. who want more and more of the commodity they are in love with.
- **Indivisible Goods:** The law cannot be applied in case of indivisible bulky goods. Example: T.V. set, house, scooter, etc. No one purchases more than one unit of such goods at a time.
- While this may be true in initial stages, beyond a certain limit these will also be subjected to diminishing utility.

Consumer Equilibrium in Single Commodity case

A consumer tries to equalise the marginal utility of a commodity with its price in order to maximise the satisfaction. Thus, compares the price with the marginal utility of a commodity. He keeps on purchasing a commodity till $MU > R$. In other words, so long as the price is less, he buys more which is also the basis of the law of demand.

→ The consumer is at equilibrium where:

Marginal Utility of the commodity = Price of the commodity

$$MU_x = P_x \cdot MU \text{ money. } \frac{MU_x}{P_x} = MU \text{ money.}$$

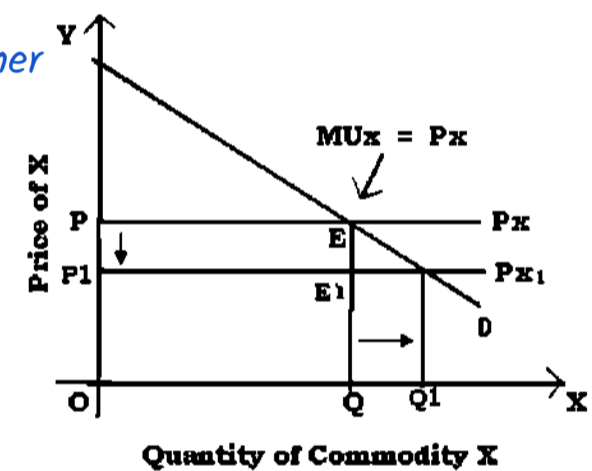
→ **Impact of Change in Price of goods on Consumer Equilibrium**

The equality between marginal utility and price is disturbed when the price of the good falls.

What will happen in case the price decreases? The consumer will consume more of the good so as to restore the equality between the marginal utility and price. The marginal utility from the good will fall when he consumes more of the good. He will continue consuming more till the marginal utility becomes equal to the new lower price.

What will happen in case price increases When the price of the good increases, he will buy less so as to equate the marginal utility to the higher price.

→ The downward sloping demand curve is directly derived from the marginal utility curve





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Concept of Consumer Equilibrium of Two products

→ In reality, a consumer spends his income to buy different commodities. In the case of many commodities, consumer equilibrium is explained with the **Law of Equi-Marginal Utility**.

→ The law states that a consumer will allocate his expenditure in a way that the utility gained from the last rupee spent on each commodity is equal or the marginal utility of each commodity is proportional to its price. The consumer is said to be in equilibrium when the following condition is met-

$$\rightarrow \frac{MU_x}{P_x} = \frac{MU_y}{P_y} = MU_{\text{money}} \quad \text{OR} \quad \frac{MU_x}{MU_y} = \frac{P_x}{P_y}$$

Limitations of the Law

The law of diminishing marginal utility is applicable only under certain assumptions.

- **Homogenous units:** The different units consumed should be identical in all respects. The habit, taste, temperament and income of the consumer also should remain unchanged.
- **Standard units of Consumption:** The different units consumed should consist of standard units. Example: If a thirsty man is given water by successive spoonfuls, the utility of the second spoonful of water may conceivably be greater than the utility of the first.
- **Continuous Consumption:** There should be no time gap or interval between the consumption of one unit and another unit i.e. there should be continuous consumption.
- **Law fails in the case of prestigious goods:** The law may not apply to articles like gold, cash where a greater quantity may increase the lust for it.
- **Case of related goods:** The shape of the utility curve may be affected by the presence or absence of articles which are substitutes or complements. Example: The utility obtained from tea may be seriously affected if no sugar is available.

Consumer Surplus

→ The concept of consumer's surplus was developed by **Alfred Marshall**. This concept occupies an important place not only in economic theory but also in economic policies of government and decision-making of monopolists. It has been seen that consumers generally are ready to pay more for some goods than they actually pay for them. This extra satisfaction which consumers get from their purchase of goods is called a **consumer's surplus by Marshall**.

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→ **Marshall's definition of the concept:** Marshall defined the concept of consumer's surplus as "excess of the price which a consumer would be willing to pay rather than go without a thing over that which he actually does pay, is the economic measure of this surplus satisfaction may be called consumer's surplus".

→ Thus consumer's surplus = what a consumer is ready to pay - what he actually pays

→ Consumer Surplus = Sum of Marginal Utilities - (Price × Units Purchased) or = Total Utility - Total amount spent.

Measurement of Consumer's Surplus

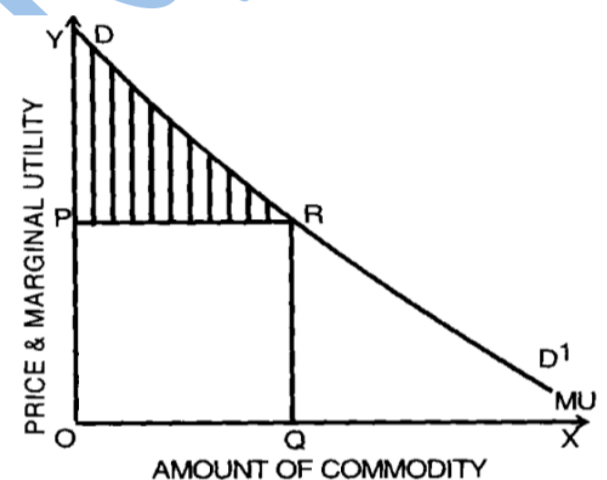
→ On the X-axis is measured the amount of the commodity and on the Y-axis is the marginal utility and the price of the commodity.

→ MU is the marginal utility curve which slopes downwards, indicating that as the consumer buys more units of the commodity, its marginal utility falls.

→ Marginal utility shows the price which a person is willing to pay for the different units rather than go without them. If OP is the price that prevails in the market, then the consumer will be in equilibrium when he buys OQ units of the commodity, since at OQ units, marginal utility is equal to the given price OP .

→ The last unit, i.e., Q th unit does not yield any consumer's surplus because the price paid here is equal to the marginal utility of the Q th unit. But for units before the Q th unit, marginal utility is greater than the price and thus these units fetch the consumer's surplus to the consumer.

→ In Figure given here, the total utility is equal to the area under the marginal utility curve up to point Q i.e. $ODRQ$. But given the price equal to OP , the consumer actually pays $OPRQ$. The consumer derives extra utility equal to DPR which is nothing but the consumer's surplus.



Importance of the consumer surplus concept

Study of Consumer behaviour to ensure repeated purchases

Consumer surplus is a measure of the welfare that people gain from consuming goods and services. It is very important to a business firm to reflect on the amount of consumer surplus enjoyed by different segments of their customers because consumers who perceive large surplus are more likely to repeat their purchases.

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Helpful in Price Discrimination	<i>Understanding the nature and extent of surplus can help business managers make better decisions about setting prices. If a business can identify groups of consumers with different elasticity of demand within their market and the market segments which are willing and able to pay higher prices for the same products, then firms can profitably use price discrimination.</i>
Useful in Investment decisions	<i>Large scale investment decisions involve cost benefit analysis which takes into account the extent of consumer surplus which the projects may fetch.</i>
Useful in Pricing Decisions	<i>Knowledge of consumer surplus is also important when a firm considers raising its product prices. Customers who enjoyed only a small amount of surplus may no longer be willing to buy products at higher prices. Firms making such decisions should expect to make fewer sales if they increase prices.</i>
Useful in deciding Taxation Policy	<i>Consumer surplus usually acts as a guide to finance ministers when they decide on the products on which taxes have to be imposed and the extent to which a commodity tax has to be raised. It is always desirable to impose taxes or increase the rates of taxes on commodities yielding high consumer's surplus because the loss of welfare to citizens will be minimal.</i>

Limitations of Consumer Surplus

01. Consumer's surplus *cannot be measured precisely* because it is difficult to measure the marginal utilities of different units of a commodity consumed by a person.
02. In the case of *necessaries*, the marginal utilities of the earlier units are infinitely large. In such cases the consumer's surplus is always infinite.
03. The consumer's surplus derived from a commodity is affected by the availability of substitutes.
04. There is no simple rule for deriving the utility scale of articles which are used for their prestige value. Example: diamonds.
05. *Consumer's surplus cannot be measured in terms of money* because the marginal utility of money changes as purchases are made and the consumer's stock of money diminishes. Marshall assumed that the marginal utility of money remains constant. But this assumption is unrealistic.
06. The concept can be accepted only if it is assumed that utility can be measured in terms of money or otherwise. Many modern economists believe that this cannot be done.

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Indifference Curve Analysis

- Ordinal analysis of demand given by **Hicks & Allen**.
- This approach to consumer behaviour is based on **consumer preferences**.
- It believes that human satisfaction, being a psychological phenomenon, cannot be measured quantitatively in monetary terms as was attempted in Marshall's utility analysis. In this approach, it is felt that it is **much easier and scientifically sound to order preferences than to measure them in terms of money**.
- The consumer preference approach is, therefore, an ordinal concept based on ordering of preferences compared with Marshall's approach to cardinality.

Assumptions Underlying Indifference Curve Approach

Rationality	The consumer is rational and possesses full information about all the relevant aspects of the economic environment in which he lives.
Capacity of Consumer to give preferences	The indifference curve analysis assumes that <u>utility is only ordinally expressible</u> . The consumer is <u>capable of ranking all conceivable combinations</u> of goods according to the satisfaction they yield. Example: if he is given various combinations say A, B, C, D and E, he can rank them as first preference, second preference and so on. However, if a consumer happens to prefer A to B, he <u>cannot tell quantitatively</u> how much he prefers A to B.
Transitive	<u>Consumer's choices are assumed to be transitive</u> . Example: If the consumer prefers combination A to B, and B to C, then he must prefer combination A to C. In other words, he has a <u>consistent consumption pattern</u> .
Law of monotonic Consumer Preference	If combination A has more commodities than combination B, then A must be preferred to B.

Concept of Indifference Curve

- An indifference curve is a curve which represents all those combinations of two goods which give the same satisfaction to the consumer.

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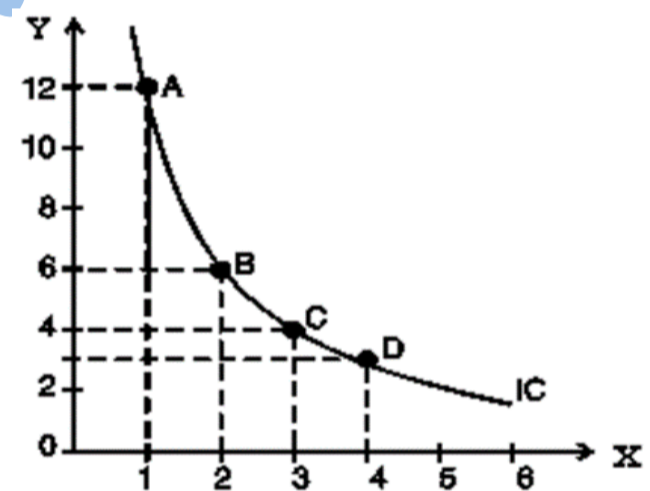
→ Since all the combinations on an indifference curve give equal satisfaction to the consumer, the consumer is indifferent among them. In other words, since all the combinations provide the same level of satisfaction the consumer prefers them equally and does not mind which combination he gets. An Indifference curve is also called iso-utility curve or equal utility curve.

Indifference Schedule

Combination	Food	Clothing	MRS
A	1	12	-
B	2	6	6
C	3	4	2
D	4	3	1

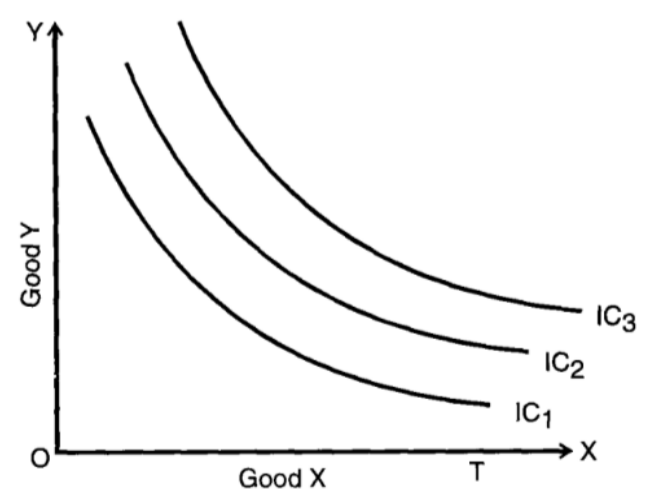
The consumer is indifferent whether he gets a combination A, B, C or D. This is because all combinations give him the same amount of satisfaction and therefore equally preferable to him.

Indifference curve : In Figure , an indifference curve IC is drawn by plotting the various combinations of the indifference schedule. The quantity of food is measured on the X axis and the quantity of clothing on the Y axis. As in indifference schedules, combinations lying on an indifference curve will give the consumer has the same level of satisfaction.



Indifference Map: A set of indifference curves is called indifference map. An indifference map depicts shows a complete picture of consumer's tastes and preferences. In Figure, an indifference map of a consumer is shown which consists of three indifference curves.

Good X on X-axis and good Y on Y-axis. It should be noted that while the consumer is indifferent among the combinations lying on the same indifference curve, he certainly prefers the combinations on the higher indifference curve to the combinations lying on a lower indifference curve because a higher indifference curve signifies a higher level of satisfaction. Thus while all combinations of IC1 give the same satisfaction, all combinations lying on IC2 give greater satisfaction than those lying on IC1.



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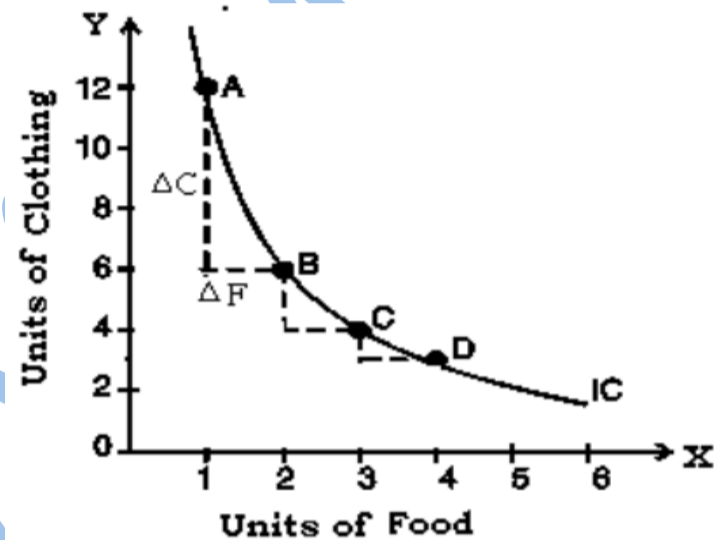


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Marginal Rate of Substitution

→ **Marginal Rate of Substitution (MRS)** is the rate at which a consumer is prepared to exchange goods X and Y.

→ MRS of X for Y as the amount of Y whose loss can just be compensated by a unit gain of X in such a manner that the level of satisfaction remains the same. The marginal rate of substitution of X for Y (MRS_{xy}) is equal to MU_x / MU_y . MRS is falling i.e., as the consumer has more and more units of food, he is prepared to give up less and less units of clothing.



→ There are two reasons for this that is:

- The want for a particular good is **satiabile** so that when a consumer has more of it, his intensity of want for it decreases.

Example, when the consumer has more units of food, his intensity of desire for additional units of food decreases.

- Most goods are **imperfect substitutes** of one another. MRS would remain constant if they could substitute one another perfectly.

Properties of Indifference Curve

→ **Indifference curves slope downward to the right:** This property implies that the two commodities can be substituted for each other and when the amount of one good in the combination is increased, the amount of the other goods is reduced. This is essential if the level of satisfaction is to remain the same on an indifference curve.

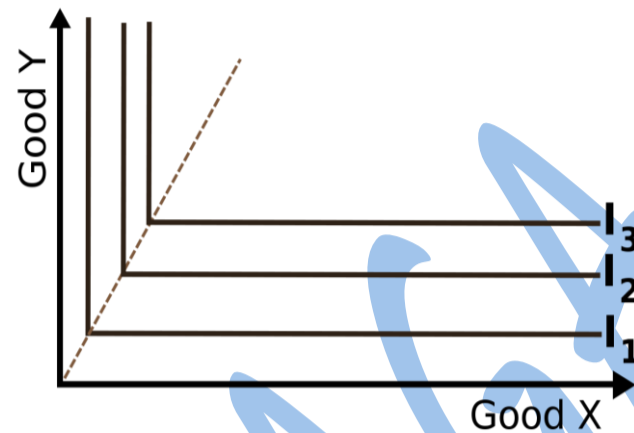
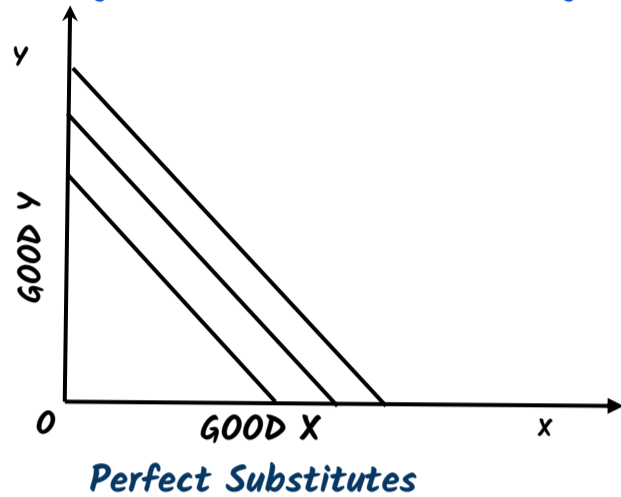
→ **Indifference curves are always convex to the origin:** It has been observed that as more and more of one commodity (X) is substituted for another (Y), the consumer is willing to part with less and less of the commodity being substituted (i.e. Y). This is called **diminishing marginal rate of substitution**. This happens mainly because the want for a particular good is satiable and as a person has more and more of a good, his intensity of want for that good goes on diminishing. In other words, the subjective value attached to the additional quantity of a commodity decreases

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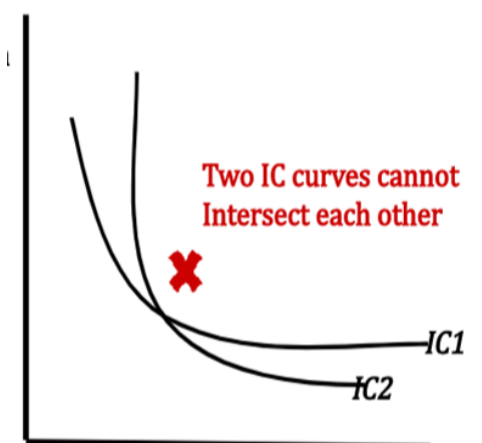
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fast in relation to the other commodity whose total quantity is decreasing. This diminishing marginal rate of substitution gives convex shape to the indifference curves.



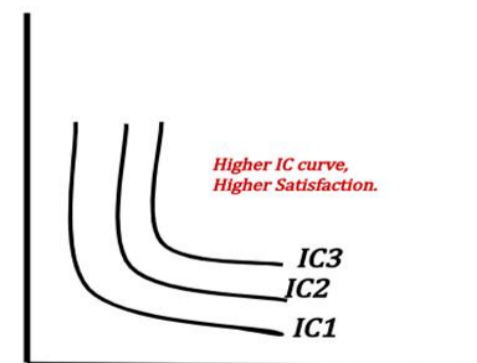
- Shape of IC in case of Perfect Substitutes When two goods are perfect substitutes of each other, the indifference curve is a straight line on which MRS is constant.
- Shape of IC in case of Perfect Complementary Goods When two goods are perfect complementary goods the indifference curve will consist of two straight lines with a right angle bent which is convex to the origin, or in other words, it will be L shaped.

→ **Indifference curves can never intersect each other:** No two indifference curves will intersect each other although it is not necessary that they are parallel to each other. In case of intersection the relationship becomes logically absurd because it would show that higher and lower levels are equal, which is not possible.



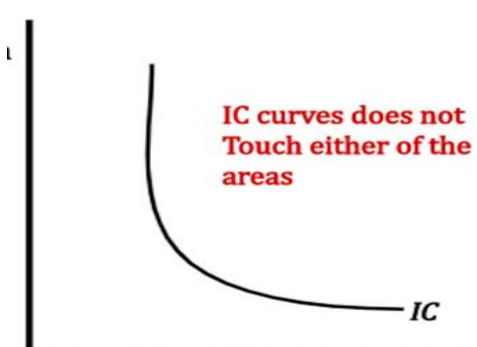
→ **Higher Indifference Curves Represents Higher Level of Satisfaction:**

In an indifference map, combinations lying on a higher IC gives a higher level of satisfaction than the combinations lying on a lower IC. But how much higher cannot be indicated. This is because combinations on higher IC contain more quantity.



→ **Indifference curve will not touch either X-axis or Y-axis:**

This is because it is assumed that consumers are considering the different combinations of Two commodities.



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Budget Line or Price Line

→A higher indifference curve shows a higher level of satisfaction than a lower one. Therefore, to maximise satisfaction consumers will try to reach the highest possible indifference curve. He will try to buy more and more goods to get more and more satisfaction. But, what and how much a consumer can actually buy depends on: →The money income of the consumer, →Prices of goods he wants to buy. They are the two objective factors which form the budgetary constraint of the consumer.

→The budgetary position of the consumer can be graphically shown by the **Budget Line**. A budget line or price line shows the maximum quantity of the different combinations of two goods that the consumer can purchase with his given money income and given market prices of goods.

→This budget line corresponds to the following equation, called **Budget Line Equation**.

$$P_x \cdot X + P_y \cdot Y = M$$

Where,

M = Total Money Income

P_x = Price of commodity 'X'

X = Quantity of X commodity

P_y = Price of commodity

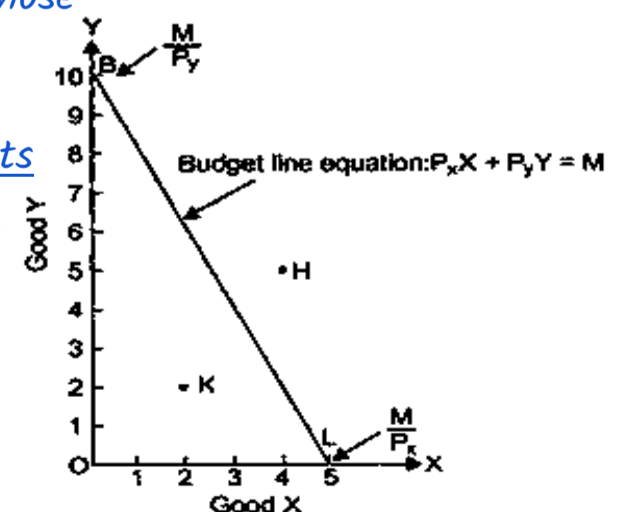
Y = Quantity of 'Y' commodity.

Observations of Budget Line

➤ **Attainable Combinations:** All points on the budget line represent those combinations of goods that can be purchased with the given amount of budget and at which complete budget is spent. On the other hand, points inside budget line represents those combinations at which entire budget is not spent i.e., some part of it remains unspent

➤ **Unattainable Combinations:** Any point outside the Budget line represents an unattainable combination i.e. these goods cannot be

purchased with the given budget and price levels. These can become attainable only in following scenarios →When prices of goods decrease →When the budget of the customer increases.



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➤ **Slope of Budget Line:** The slope of the budget line is equal to the ratio of the prices of two goods i.e. ratio of the prices of X to the price of Y. Thus, the slope of the budget line PL is $\frac{P_x}{P_y}$.

Consumer Equilibrium under Ordinal Approach

Meaning: The consumer is said to be in equilibrium when he maximise his satisfaction i.e., utility, given the constraint of his limited budget.

Assumptions Consumer Equilibrium

1. The income of the consumer is given and constant.
2. The prices of the goods purchased by the buyer are also given and constant.
3. The consumer is a rational person.
4. He has a full knowledge of market prices and his scale of preferences.

Consumer Equilibrium are achieved through

To explain the consumer's equilibrium under ordinal approach, we have to make use of two tools of indifference curve analysis namely-

1. The Consumer's Indifference Map, and
2. Price/Budget line.

➤ **The CONSUMER'S INDIFFERENCE MAP** shows all indifference curves which rank the consumer's preferences between various possible combinations of Two commodities. To maximise his satisfaction, the consumer would like to reach the highest possible indifference curve. The **slope of IC at any one point shows the Marginal Rate of Substitution which diminishes**. Thus, $MRS_{xy} = \frac{MU_x}{MU_y}$.

To maximise satisfaction consumers will try to reach the highest possible IC and so will try to buy more and more of the two commodities.

➤ But there are limits, these limits are imposed (i) his money income, & (ii) prices of the commodities. These limits are described by Price or Budget Line.

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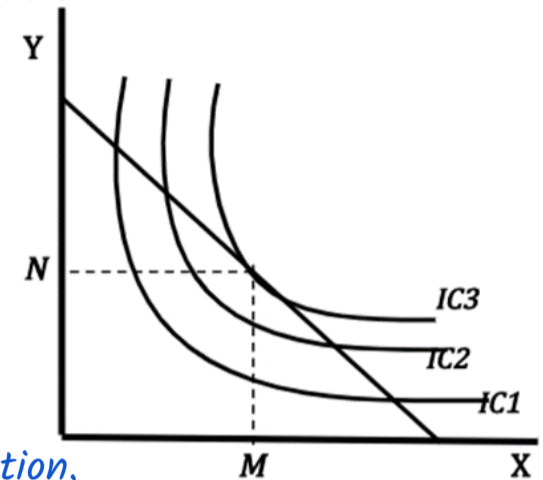
PRICE/ BUDGET LINE: which shows the various combinations of two commodities the consumer can afford to buy. All the combinations lying on the budget line are affordable by the consumer. Any combination lying beyond the budget line is unaffordable.

→The slope of budget/price line shows the ratio of the prices of two commodities i.e., $\frac{P_x}{P_y}$.

→A consumer reaches equilibrium i.e., how he allocates his money expenditure between commodities X and Y and gets maximum satisfaction.

→In order to maximise his satisfaction, the consumer will try to reach highest IC i.e. IC4. But the budget constraint forces him to remain on the Budget Line.

→In the diagram, the budget line shows all the combinations of X & Y that the consumer can buy. In the diagram, we find combinations a, b, c, d, e lie on the budget line and hence are affordable.





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Unit 3: Supply

Meaning of Supply

Supply of a commodity refers to the quantity of commodity offered for sale at a particular price during a given period of time. Thus, the supply of a

commodity may be defined as the amount of commodity which the sellers or producers are able and willing to offer for sale at a particular price, during a given period of time.

→It is but natural that at different prices the quantities supplied are different. Therefore, **supply is a flow concept.**

→A distinction between stock and supply of a product. The **stock** of a product can be defined as the **total quantity** that the producers have for offering in the market. The **supply** is that part of stock which is actually brought to the market for sale at a given price. Thus stock is independent of price while the supply is a function of price.

→**Features:**

1. Supply of a commodity is always with reference to a Price.
2. Supply of a commodity is to be referred to in a given period of time.
3. Supply of a commodity depends on the ability of the seller to supply a commodity. However, the ability of a seller to supply a commodity depends on the stock available with him.
4. Supply of a commodity also depends on the willingness of the seller to supply a commodity.

Determinants of Supply

Supply of a commodity depends on many factors like price of the commodity, price of related goods, prices of factors of production, technology, etc. All determinants of supply can be expressed in the form of supply function as follows- $S_x = f(P_x, P_r, P_f > T, O, \dots)$.

Where, S_x = Quantity supplied of commodity x

f = function of (depends on)

P_x = Price of commodity x

P_r = Price of related commodities

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P_f = Prices of factors of production.

T = Technology

O = Objectives/Goals of the firm

Price of the commodity	Other things being equal, the supply of a commodity is directly related to its price. It means that, larger quantity of a commodity is offered for sale at a higher price and vice versa. This is because the profits of the firm increase if the price of its product increases.
Price of the related commodities	If the prices of other goods rise, they become relatively more profitable to the firm to produce and sell than the goods in question. It implies that, if the price of Y rises, the quantity supplied of X will fall. Example: if the price of wheat rises, the farmers may shift their land to wheat production away from corn and soya beans.
Prices of factors of production	Supply of a commodity depends on the cost of production. The cost of production itself depends upon the prices of various factors of production. So, if the price of any factor of production rises, the production costs would be higher for the same level of output and vice versa, Hence the supply will tend to decrease. Conversely, a fall in the cost of production tends to increase the supply.
State of technology	A change in technology affects the supply of commodities. A technological progress and improvement in the methods of production increases productivity, reduces the cost of production and increases the profits. As a result more is produced and supplied. Also discoveries and innovations bring a new variety of goods.
Government Policy	The supply of a commodity is also affected by the economic policies followed by the Government. The Government may impose taxes on commodities in the form of excise duty, sales tax and import duties or may give subsidies. Any increase in such taxes will raise the cost of production and so the quantity supplied will fall. Under such conditions supply will increase only when its price in the market rises. Subsidies reduce the cost of production and thus encourages firms to produce and sell more.
Nature of competition and size of industry	Under competitive conditions, supply will be more than that under monopolised conditions. If there are a large number of firms in the market, supply will be more. Besides, entry of new firms, either domestic or foreign, causes the industry supply curve to shift rightwards.
Other Factors	The quantity supplied of a good also depends upon the government's industrial and foreign policies, goals of the firm, infrastructural facilities,

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natural factors such as weather, floods, earthquake and man-made factors such as war, labour strikes, communal riots etc.

Law of Supply

→The Law of Supply expresses the nature of the functional relationship between the price of a commodity and its quantity supplied. It simply states that supply varies directly to the changes in price i.e., supply of a commodity expands when price rises and contracts when price falls.

→“The Law of Supply states that the higher the price, the greater the quantity supplied or the lower the price the smaller the quantity supplied, other things remaining the same.” **Dooley.**

→Thus, there is Direct Relationship between supply and price. It is assumed that other determinants of supply are constant and only price is the variable & influencing factor.

→Thus, the law of supply is based on the following main assumptions:-

- Cost of production remains unchanged even though the price of the commodity changes.
- The technique of production remains unchanged.
- Government policies like taxation policy, trade policy, etc. remain unchanged.
- The prices of related goods remain unchanged.
- The scale of production remains unchanged etc.

→A Schedule known as supply schedule can be prepared to explain the law. It is a hypothetical table showing various quantities supplied at different prices. Here such a schedule is given :

Price (₹)	Quantity Supplied
2	1000
4	2000
6	3000
8	4000
10	5000

This is indeed a very simple schedule. It simply points out to the fact that higher the price, larger would be the quantity supplied.

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Supply Curve

→When the same information is presented in the form of a diagram, it becomes a curve known as the supply curve. In the diagram given here, we can see that the price of the product is taken on the Y-axis and its quantity supplied is taken on the X-axis. At various prices, there are various quantities supplied. Each point on the supply curve represents a unique price-quantity situation. When we join all these points we get the supply curve for the product.

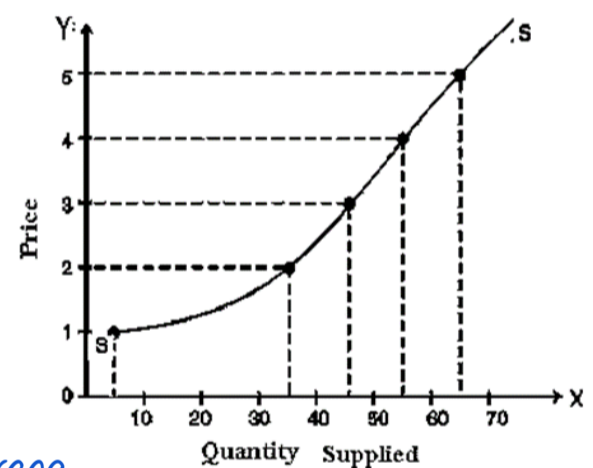
→In the diagram, we can see that the **supply curve has a positive slope**. It rises upwards from the left to the right. It means that larger and larger quantities would be offered in the market for sale only when the price goes up. It is necessary to understand the rationale of the supply curve.

→**Rationale (Logic) Of The Supply Curve:** One has to understand the reason for the direct relationship between price and quantity supplied.

1. More Profit: Given the stock of the product with the producers, higher the price of the product, higher will be the margin of profit for producers and so greater will be their willingness to sell their product.

2. Rising Average Cost: If more output is to be produced, beyond a certain limit, the extra output can be obtained only at a higher average cost due to the operation of the law of diminishing returns and so unless price goes up, the supply would not increase.

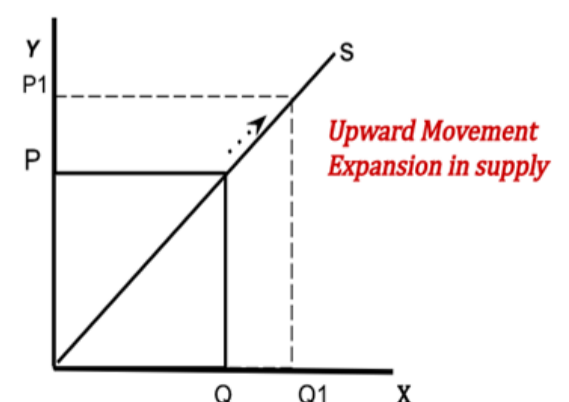
3. Different Firms: With the rising price, even those firms which are relatively inefficient and have a higher average cost of production, would be able to put their supply in the market. So also the quantity supplied increases.



MOVEMENTS ON THE SUPPLY CURVE—INCREASE OR DECREASE IN THE QUANTITY SUPPLIED

→When supply of a commodity changes only due to a change in the price of the commodity other determinants remain unchanged, it is called **changes in quantity supplied**.

→Changes in quantity supplied thus means—expansion of supply &



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contraction of supply. As other determinants of supply like price of related commodities, prices of factors of production, state of technology, etc. are assumed to be constant, the position of the supply curve remains the same.

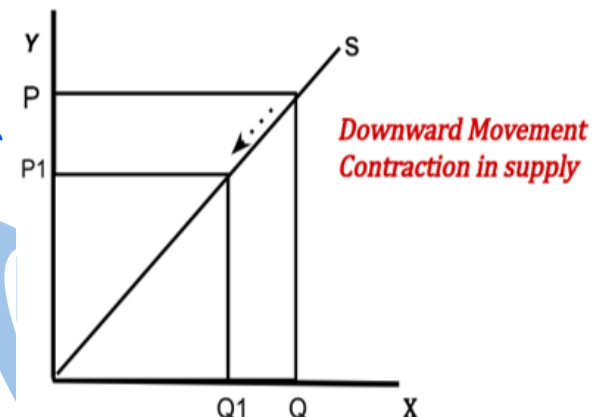
→When the price of a commodity rises, the quantity supplied also rises.

This is called **expansion of supply.**

→When the price of a commodity falls, the quantity supplied also falls.

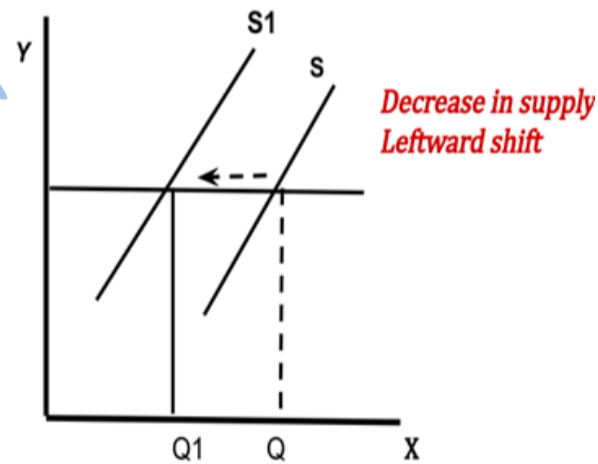
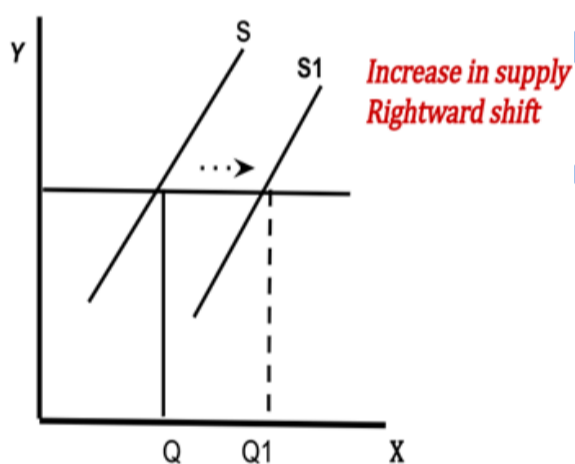
This is called **contraction of supply.**

→The seller will move upwards or downwards on the same supply curve.



SHIFTS IN SUPPLY CURVE—INCREASE OR DECREASE IN SUPPLY

→When there is change in supply due to change in factors other than price of the commodity, it is called **changes in supply.** It is the result of changes in technology, govt, policies, prices of related goods etc.



→Change in supply means- increase in supply & decrease in supply.

→In this case the supply curve shifts from its original position to rightward when supply increases and to leftward when supply decreases. Thus, change in supply curve as a result of increase and decrease in supply, is technically called shift in supply curve.

→Price remains the same when supply rises due to change in factors other than price, it is called increase in supply.

→Price remains the same when supply falls due to change in factors other than price, it is called decrease in supply.

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Elasticity of supply

Price elasticity of supply measures the degree of responsiveness of quantity supplied of a commodity to a change in its own price. In other words, the elasticity of supply shows the degree of change in the quantity supplied in response to change in the price of the commodity.

→ Elasticity of supply can be defined as a ratio of the percentage change in the quantity supplied of a commodity to the percentage change in its own price.

→ It may be expressed as follows: $ES = \frac{\% \text{ Change in Quantity Supplied}}{\% \text{ Change in Price}}$

$$ES = \frac{\text{Change in Quantity Supplied}}{\text{Quantity Supplied}} \div \frac{\text{Change in Price}}{\text{Price}} \quad \text{OR} \quad ES = \frac{\Delta q}{q} \div \frac{\Delta p}{p}$$

Where, E_s = Elasticity of supply

Q = Original quantity supplied

P = Original price

Δ = indicates change

Rearranging the above expression we get: $ES = \frac{\Delta q}{q} \times \frac{p}{\Delta p} = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$

→ Since the law of supply establishes a positive relationship between price and quantity supplied, the elasticity of supply would be positive. The value of elasticity coefficient will vary from zero to infinity.

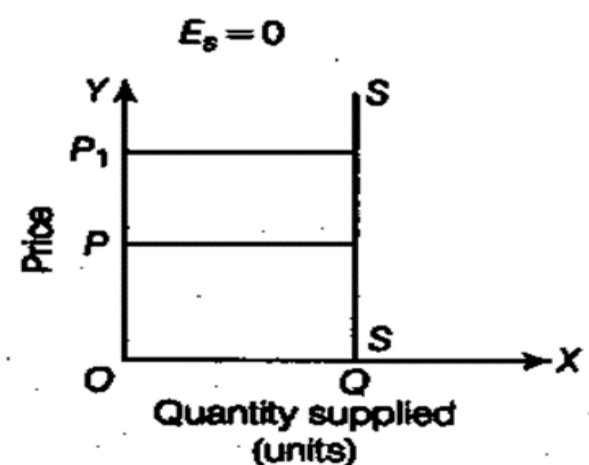
→ The elasticity of supply, according to its degree, may be of following types:-

> Perfectly Inelastic Supply $E_s=0$:

→ When a change in the price of a commodity has no effect on its quantity supplied, then supply is perfectly inelastic.

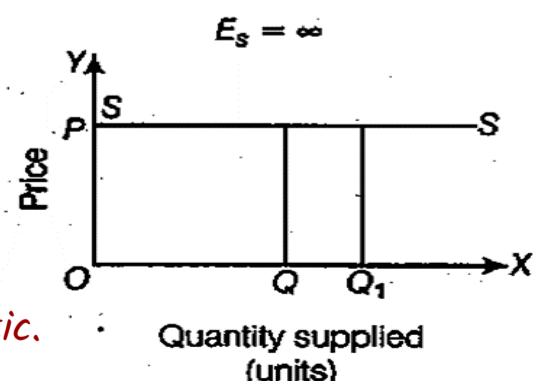
→ Example: If price rises by 30% and the quantity supplied remains unchanged then $E_s=0$.

→ The supply curve is a vertical straight line curve parallel to the Y-axis. Whatever the price quantity supplied of the commodity remains unchanged at OQ .



> Perfectly Elastic Supply ($E_s = \infty$):

→ When with no change in price or with very little change in price, the supply of a commodity expands or contracts to any extent, the supply is said to be perfectly elastic.



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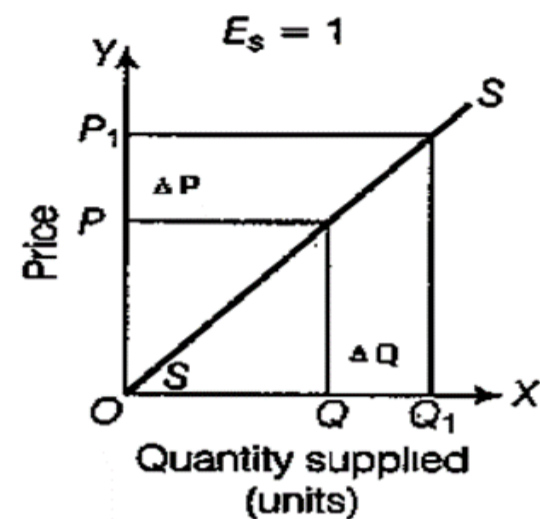
→The supply is a horizontal straight line parallel to the X-axis.

→At a given price supply is ever increasing.

➤ Unit Elastic Supply ($E_s = 1$):

→When the percentage change in price is equal to the percentage change in quantity supplied, then the supply is said to be **unit elastic**.

→The straight line supply curve SS when extended will pass through the origin.



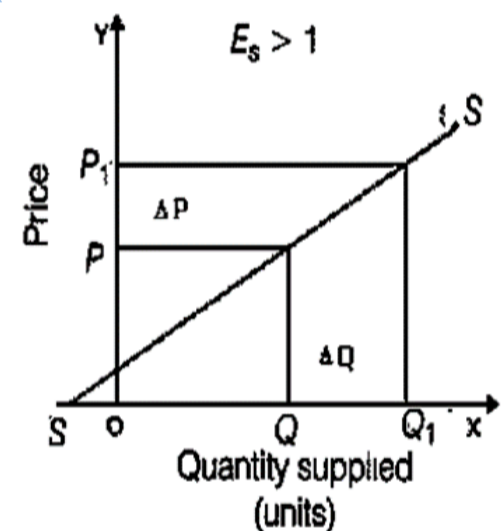
➤ Relatively or More Elastic Supply ($E_s > 1$):

→When a small change in price leads to a big change in quantity supplied, then the supply is said to be **relatively or more elastic**.

→The coefficient of elasticity would be somewhere **between one and infinity**.

→The elastic supply curve is **flatter** as shown below-Supply curve SS is flat suggesting that the supply is more elastic.

→The supply curve SS when extended will pass through the Y-axis.



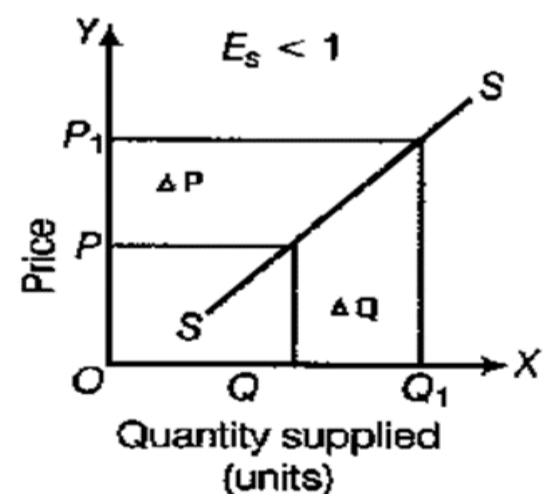
➤ Relatively Inelastic Or Less Elastic Supply ($E_s < 1$):

→When a big change in price leads to a small change in quantity supplied, then supply is said to be **relatively inelastic or less elastic**.

→The coefficient of elasticity would be somewhere **between zero and one**. The supply curve in this case has a steep slope.

→Supply curve SS is steeply sloped suggesting that supply is less elastic.

→The supply curve SS when extended will pass through the X-axis.



Measurement of Elasticity of Supply

The different methods of measuring price elasticity of supply are:

1. The Percentage or Ratio or Proportional Method,
2. The Arc Method

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Percentage Method

→ This method is based on the definition of elasticity of supply. The coefficient of price elasticity of supply is measured by taking the ratio of percentage change in supply to the percentage change in price.

→ Thus, the elasticity by using the following formula: $ES = \frac{\% \text{ Change in Supply}}{\% \text{ Change in Price}}$ OR $\frac{\Delta q}{q} \times \frac{p}{\Delta p}$.

- If the coefficient of above ratio is equal to one, the supply will be unitary.
- If the coefficient of above ratio is more than one, the supply is relatively elastic.
- If the coefficient of above ratio is less than one, the supply is relatively inelastic.

Arc Elasticity Method

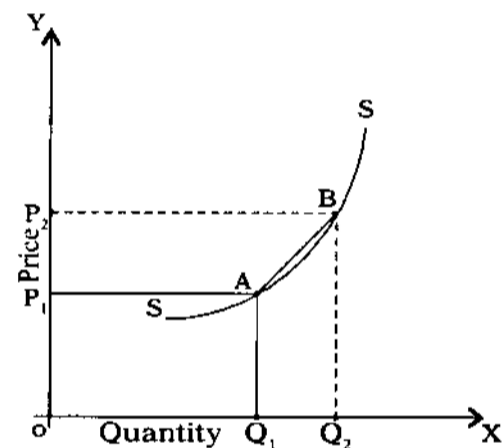
→ Under this method, measure elasticity of supply over an Arc of the supply curve.

→ The arc elasticity is a measure of the “average elasticity” i.e. elasticity at Midpoint that connects the two points on the supply curve.

→ Thus, an arc is a portion of a curved line, hence a portion of the supply curve. The formula:

$$ES = \frac{q_1 - q_2}{q_1 + q_2} \times \frac{p_1 + p_2}{p_1 - p_2}$$

→ Where, P_1 & q_1 = Original price and quantity P_2 & q_2 = New price and quantity.



Factors Affecting Elasticity Of Supply

The following factors determine the elasticity of supply:

Natural Factors	The <u>supply of certain products depends upon natural factors.</u> Example: apples, rice, etc. Here the <u>supply is inelastic.</u> Example: Even if the price of apples goes up, its supply cannot be increased. On the other hand, the <u>supply of products depends upon human efforts.</u> Example: pencils, furniture, etc. are <u>highly elastic.</u> The production of these goods can be immediately and significantly increased in response to price change.
Availability of Complementary Factors	Supply of goods will also be <u>inelastic if complementary factors are not available.</u> Example: even if the price of cotton textiles increases, their supply <u>cannot be increased</u> if complementary factors like electricity, transport etc. are <u>not available in enough quantity.</u>
Unused	If the industries in the country operate with excess unused capacities,

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Production Capacity	their supply would be highly elastic because as soon as prices of the goods of these industries go up producers would start producing more by using unused capacities.
Nature of Products	Certain products require a great degree of skill and training which cannot be immediately acquired. Example: marble statues, carpets, hand-woven silk sarees etc. Their supply cannot be immediately increased because the workers to produce these goods are not easily available and also they cannot be easily trained.
Time Period	Generally the <u>supply of various products is inelastic during a short period and highly elastic in the long run.</u> This is because the supply can be easily increased in the long run by expanding production capacities of the existing units and setting up new units in various industries.
Rare Articles	The <u>supply of rare articles is perfectly inelastic.</u> Example: the supply of the things like Gandhi's handwriting or paintings of deceased (dead) painters cannot be increased whatever may be the increase in their price. <u>The supply of such goods is fixed and so can not respond to price changes.</u>
Additional Cost	Sometimes due to the operation of the law of Diminishing returns, the additional cost of production is high, then the supply of the product would not increase even if the price of the product goes up. Example: if the additional cost of bringing out coal from the coal mines is very high compared to the increase in price, the supply would not increase even if the price goes up.
Technology	The firms employing <u>capital intensive technology</u> can easily increase the production with the increase in demand and so the supply of such firms is <u>highly elastic.</u> The supply of goods in whose production <u>labour intensive technology</u> is used is <u>relatively inelastic.</u>

Equilibrium Price

→ Equilibrium means a market situation where the quantity demanded is equal to quantity supplied.

Thus, the two factors determining equilibrium prices are market demand and market supply.

→ Equilibrium price is the price at which the sellers of a good are willing to sell the quantity which buyers want to buy. Thus, equilibrium price also called market clearing price is the price at which demand and supply are equal.

→ At equilibrium price both sellers and buyers are satisfied. There is neither shortage nor surplus. So at equilibrium price, the market is said to be Cleared.

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→The market is Cleared as the quantity demanded and supplied are equal to each other. There, is no Surplus. Thus, we can conclude that the pressure of excess supply/surplus reduces the price.

→Market demand > Market supply and there is excess demand or Shortage of supply. As a result of excess demand or Shortage of supply the market price will rise. So long as pressure of excess demand continues, prices will rise i.e., till point E.

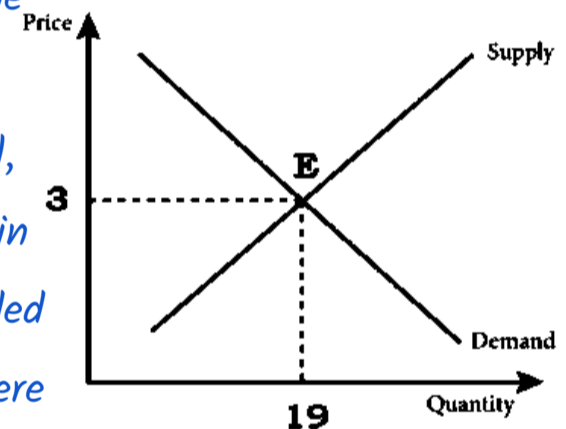
→The following table and figure explains the equilibrium price

PRICE (₹)	QUANTITY DEMANDED	QUANTITY SUPPLIED	IMPACT ON PRICE
5	6	31	Downward
4	12	25	Downward
3	19	19	Equilibrium
2	25	12	Upward
1	31	6	Upward

Demand and supply are in equilibrium at point E where the two curves intersect each other.

It means that only at price ₹3 the quantity demanded is equal to the quantity supplied. The equilibrium quantity is 19 units and these are exchanged at price ₹3. If the price is more than the equilibrium level, excess supply will push the price downwards as there are few takers in the market at this price. If the price is say ₹5, the quantity demanded is 6 units which is quite less than the quantity supplied 31 units. There will be excess supply in the market which will force the sellers to reduce

price if they want to sell off their product. Hence the price will fall and continue falling till it reaches the level where the quantity demanded becomes equal to the quantity supplied. Opposite will happen when quantity demanded is more than the quantity supplied at a particular price.



SUMMARY NOTES

→ Demand - Desire backed by capacity willingness to spend.

→ Demand - Desire + Capacity + Readiness.

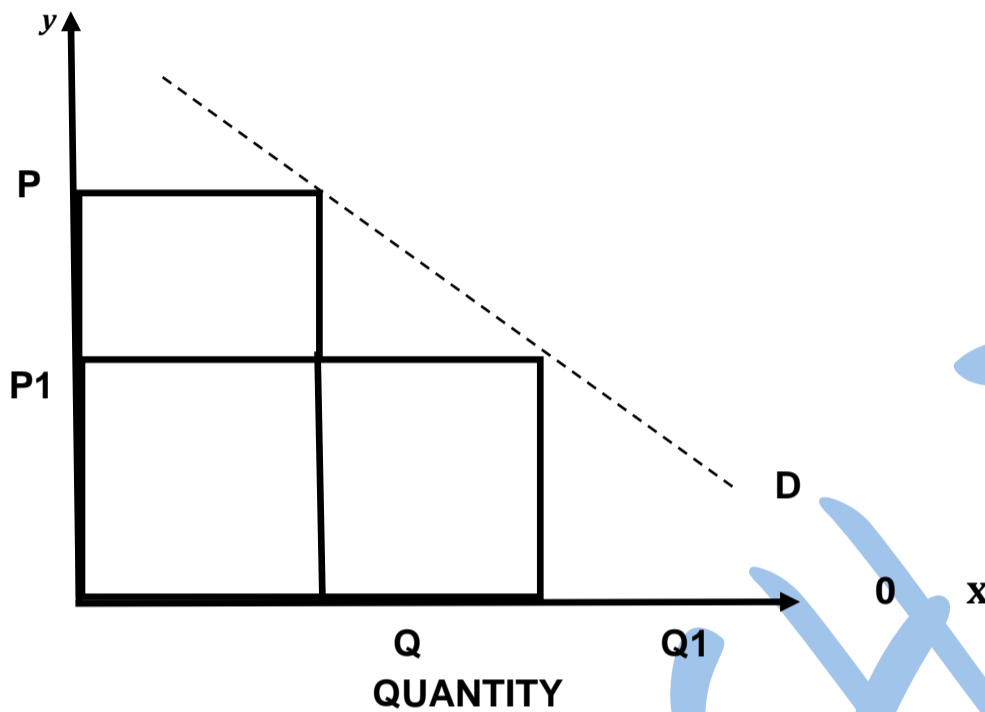
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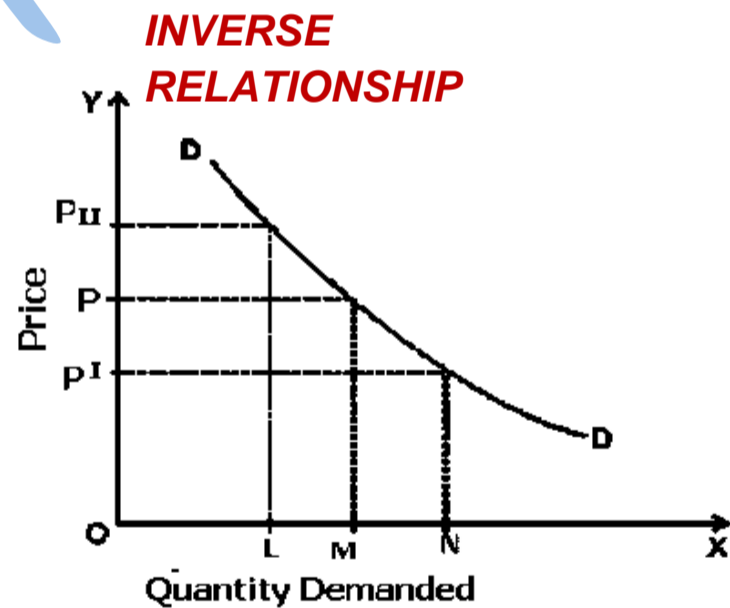
→ Law of Demand: Other things remaining / being constant Relationship between price and quantity.

Price ↑ Quantity ↓
 Price ↓ Quantity ↑
 Inverse Relationship



- Negative Slope
- Downward Sloping demand curve.

Price	Quantity
5	20
4	30
3	40
2	50



→ Determinants of Demand: Factors other than price, affecting the demand

Price of related goods - (substitute goods) (Pepsi and Coke)

- Income - **Income ↑ Qty Demanded ↑**
 Income ↓ Qty Demanded ↓

Consumer expectations

Population - **Population ↑ Qty Demanded ↑**
 Population ↓ Qty Demanded ↓

-Consumer credit facility- More credit facility More "Quantity demanded.

-Tastes and Preferences.

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-Government policies i.e., Spending Taxes)

→ **Bandwagon effect / Demonstrative Effect:** Everyone else did - Let's do it. I don't know where I am going but everyone is going there it must be good. People are like sheep who tend to follow others.

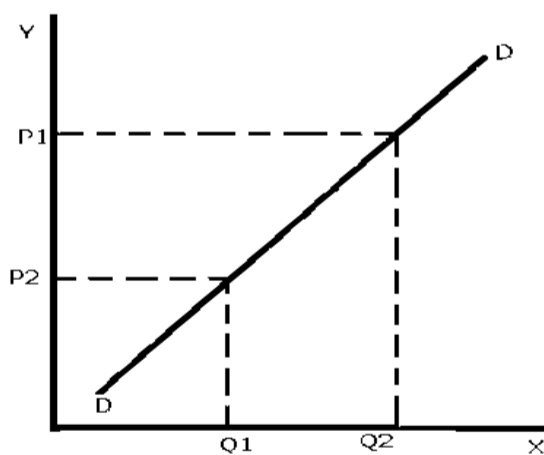
→ **Veblen Effect:** -

- These are Luxury goods.
- Demand rises as a result of price.
- Apparent contradictions of Law of Demand.
- American Economist Thorstein Veblen.

→ **Snob Effect:** -

- Desire of own unique or exclusive goods.
- Max. Users- Starbucks.
- Designer clothes

→ **Exceptions of Law of Demand:** -



°Positive Slope
°Direct Relationship
°Upward Sloping.

→ **Giffen Goods** - Given by Sir Robert Giffen, a Scottish Economist and statistician.

$P \uparrow Q \uparrow$. Ex. Bread & Meat.

→ **Emergencies**

→ **Ignorance** - Lack of information

→ **Conspicuous Necessities** - Something become necessities of modern life Ex. Tv Refrigerator, AC. We have to purchase inspite of price goes up

→ **Future change in prices**

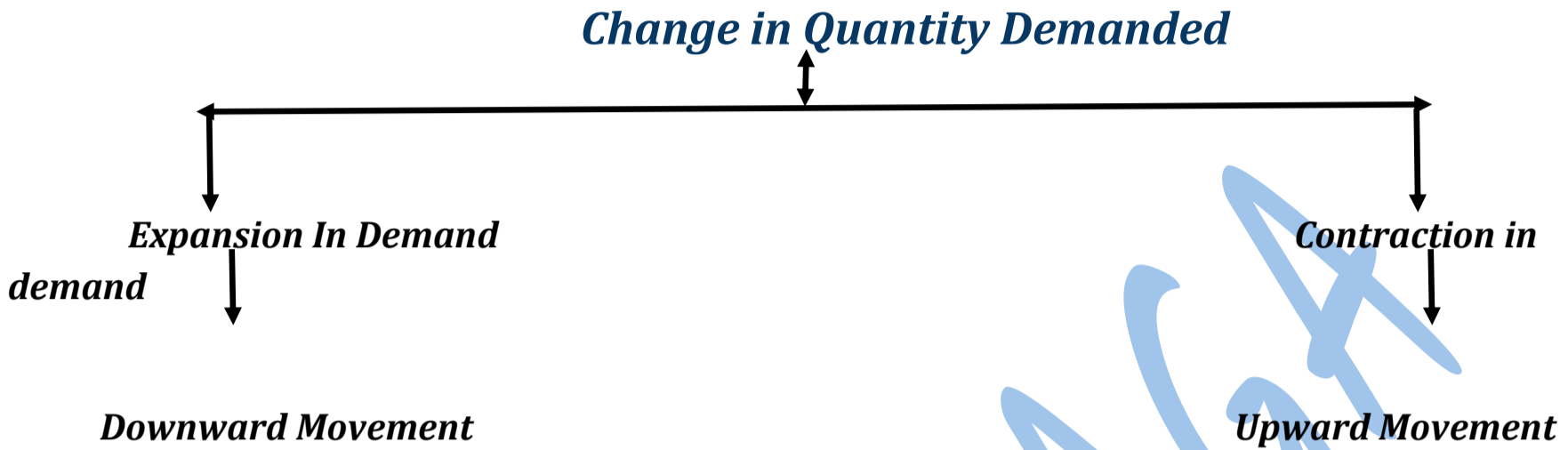
→ **Change in Fashion taste & Preferences**

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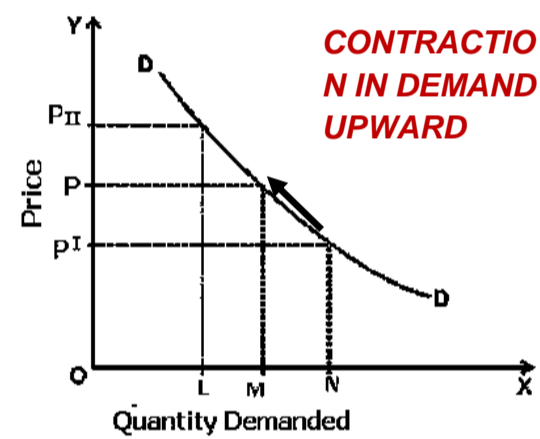
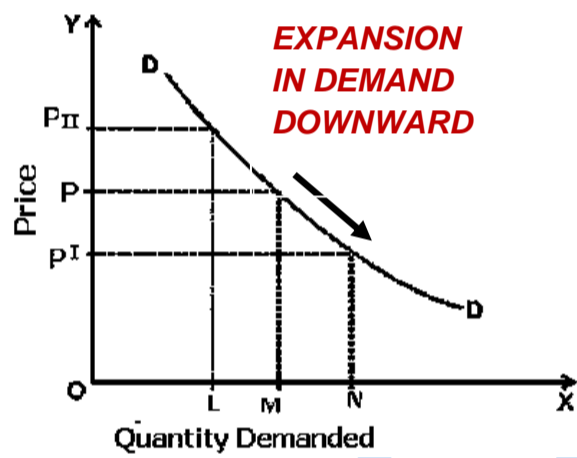


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⇒ Change In Demand



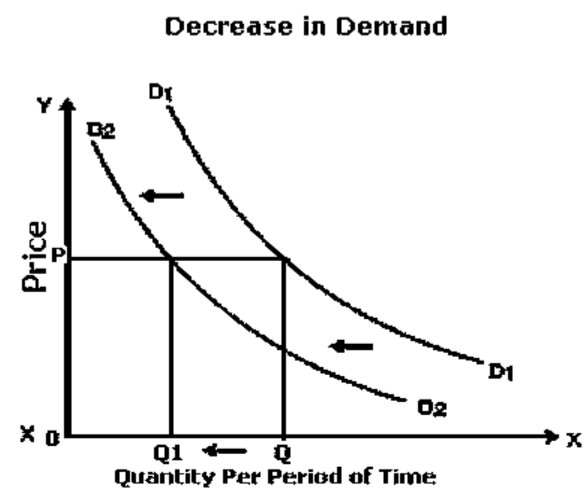
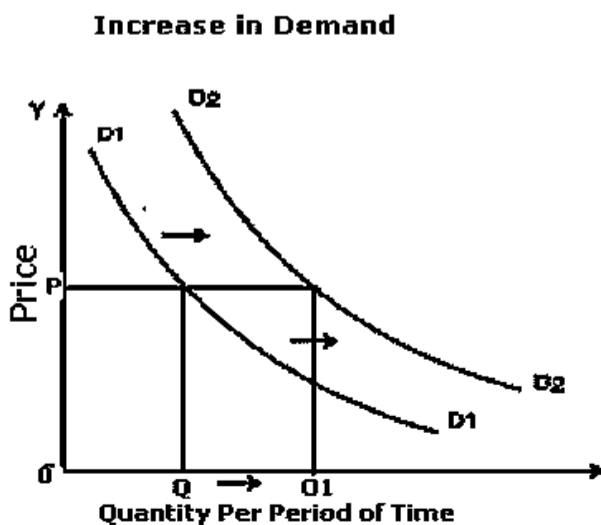
[Movement Along with demand curve due to change in Prices]



Change in Demand



[Shift in Demand curve Due to Factors other than Prices]



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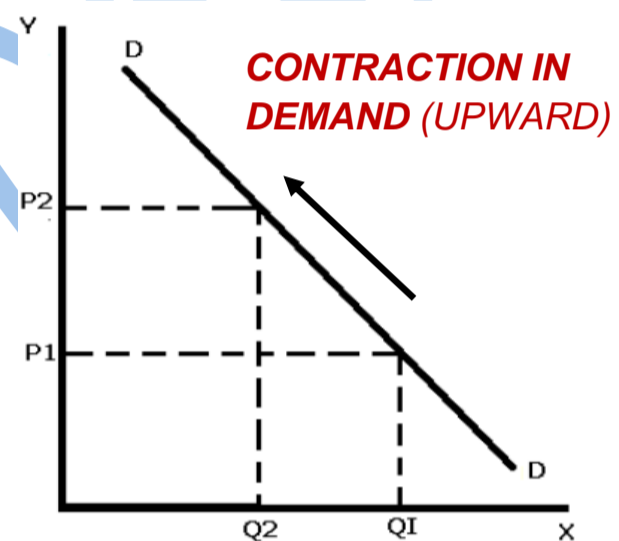
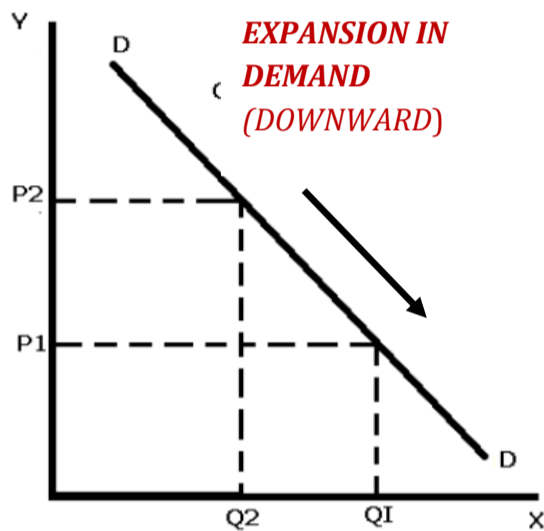
→ Elasticity of Demand:

Elasticity- Responsiveness/ Sensitivity in demand

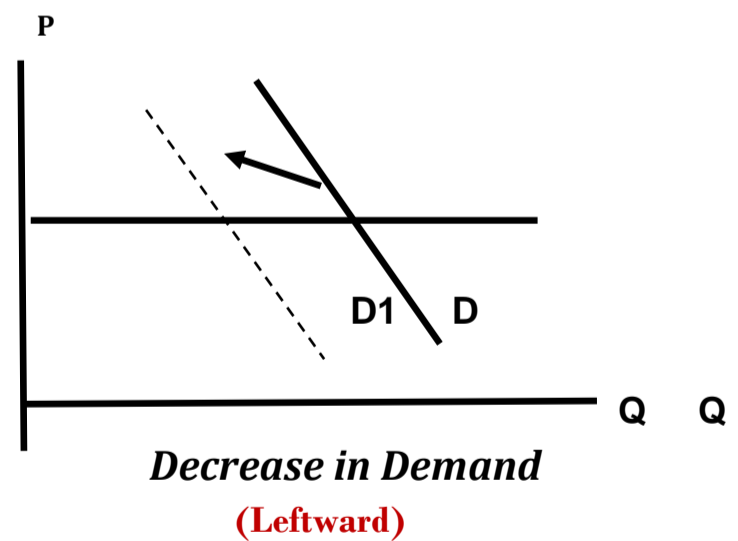
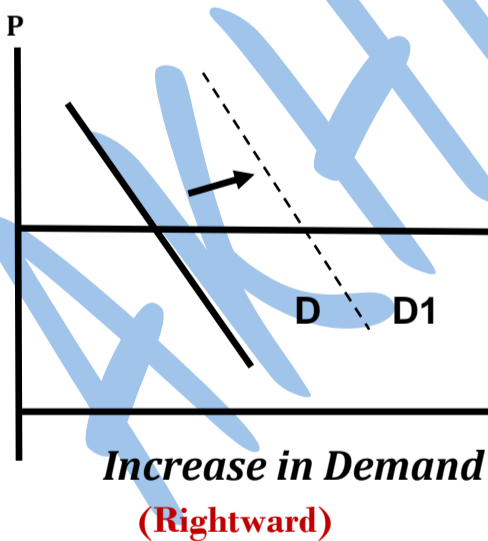
→ ELASTICITY:

- PRICE ELASTICITY
- INCOME ELASTICITY
- ADVERTISEMENT ELASTICITY
- CROSS ELASTICITY

MOVEMENT ALONG THE CURVE (PRICE)



SHIFT IN DEMAND CURVE (OTHER FACTORS)



→ Price Elasticity:

$\frac{\% \text{age change in Qty. Demanded}}{\% \text{age change in Price}}$

- Perfectly elastic demand.
- Perfectly inelastic demand.
- Relatively elastic demand.
- Relatively inelastic demand.

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- Unitary elastic demand.

Income Elasticity:

%age change in Qty. Demanded / %age change in Income.

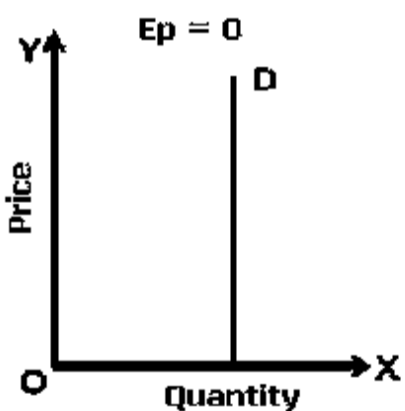
- Normal goods- $e > 1$, Positive.
- Inferior goods- Negative income Elasticity.
- Luxury goods- $e > 1$.
- Necessity goods- $e < 1$.
- Unitary Income Elasticity- $e = 1$.

Advertisement Elasticity:

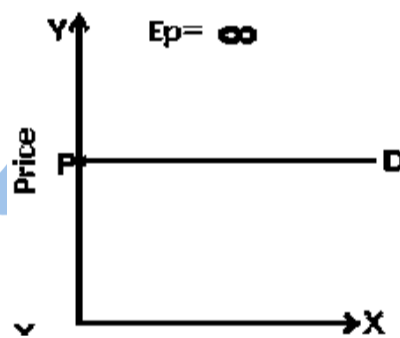
%age change in Qty. Demanded / %age change in Advertisement Expenses

- $e > 1$ ✓
- $e < 1$ ✗
- $e = 0$ ✗

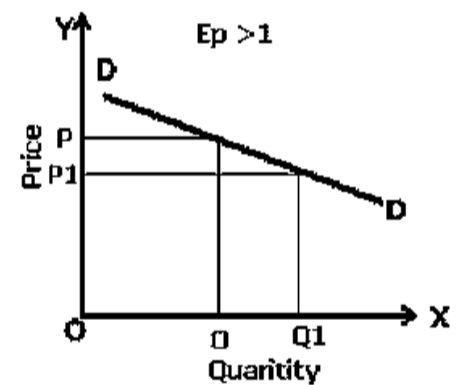
PRICE ELASTICITY



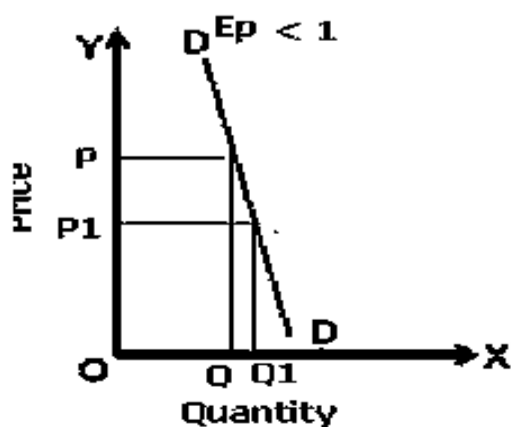
- Perfectly inelastic.
- Vertical Curve Parallel to Y-axis
- $e = 0$



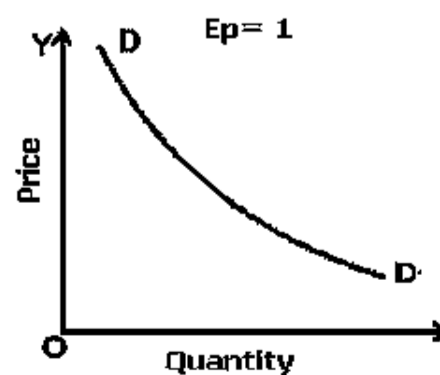
- Perfectly elastic.
- Horizontal Curve Parallel to X-axis.
- $e = \infty$



- Relatively elastic.
- Flatter Curve.
- $e > 1$.



- Relatively Inelastic.



- Unitary elastic.

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- Steeper Curve.
- $e < 1$.

- Rectangular Hyperbola.
- $e = 0$.

→ CROSS ELASTICITY

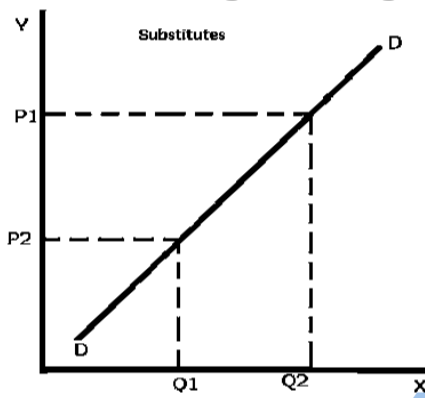
Substitute goods

- Tea & Coffee
- Pepsi & Coca - Cola

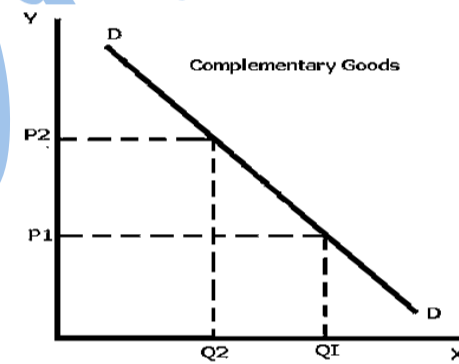
Complementary goods

- Car & Petrol
- Pen & Ink.

$\frac{\% \text{age Change in Qty. Demanded of X}}{\% \text{age Change in Price of Y}}$

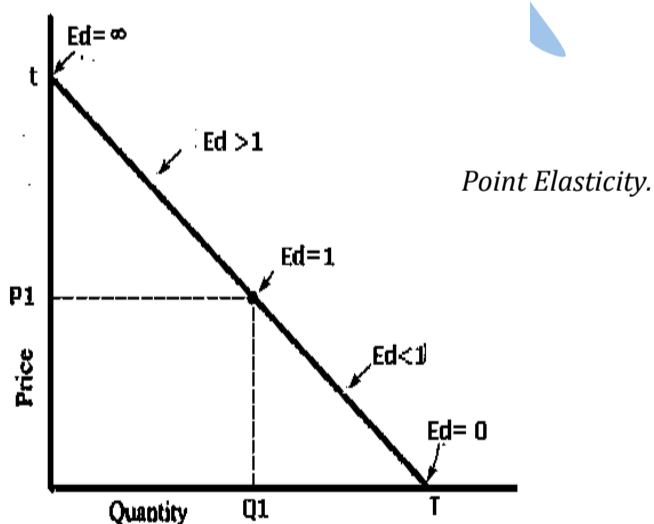


- Positive Slope.
- Direct relationship.
- Upward sloping Demand Curve.



- Negative Slope.
- Inverse relationship.
- Downward sloping.

→ POINT ELASTICITY



- Lower Segment/ Upper Segment.
- When change is very small, infinitely small, we use

→ ARC ELASTICITY

$$\frac{Q_2 - Q_1}{Q_2 + Q_1} \times \frac{P_2 + P_1}{P_2 - P_1}$$

Total Revenue/ Total Outlay/ Total Expenditure Method

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CHAPTER 2: THEORY OF DEMAND & SUPPLY

Price Effect	Elastic	Unitary Elastic	Inelastic
Price Increase	TR Decrease	TR remains Same	TR Increase
Price Decrease	TR Increase	TR remains Same	TR Decrease

→ DEMAND FORECASTING:

METHODS:

SURVEY METHOD	STATISTICAL METHOD
<ul style="list-style-type: none"> • Customer Interview Method/ Customer enumeration Method. • Sales Force Opinion method/ Collectice Opinion method/ Gross root Approach. • Expert Opinion method. • Consumer Clinics • End User. 	<ul style="list-style-type: none"> • Trend Projection method. • Co- relation & Regression. • Simultaneuous equation method. • Barometric Technique.

- Expert Opinion method is also known as Delphi Technique.
- Barometric Technique is an improvement to trend projection method (Internal + External).

→ DETERMINATES OF PRICE ELASTICITY OF DEMAND:

- **Availability of Substitutes**- More Substitutes=More Elastic.
-Less Substitutes= Less Elastic/ Inelastic.
- **Position of Commodity in consumers Budget**-
Income Spent very Low = Inelastic (Ex. Match book)
Income Spent very High = Elastic (Ex. Luxury goods).
- **Habitual goods**- Inelastic (Ex. Alcohol).
- **Nature of needs that commodity satisfies**- Luxury (TV, Car) = Elastic. ($e > 1$).
- Necessity (Medicines) = Inelastic. ($e < 1$).
- **Number of uses to which commodity can be put**- More uses= Elastic &
Less uses = Inelastic.
- **Tied Demand**- Inelastic (Ex. Car & Petrol).
- **Time Period** - Peak Time ↑ Inelastic & ↑ Off time Elastic.
- **Price Range**- Price↑ Inelastic

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CHAPTER 2: THEORY OF DEMAND & SUPPLY

Price↓ Inelastic

Elastic = Farak Padta Hain!
Inelastic = Farak Nahi Padta Hain!

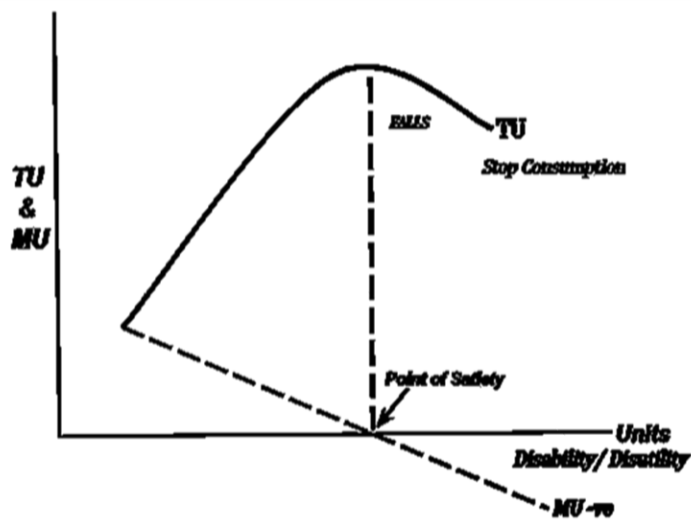
→ Consumer Behaviour:

Utility- Want satisfying power

- Anticipated satisfaction
- Forms the basis of demand
- First stage of consumption.

Marshall
↓
Law of DMU

Cardinal utility
↓
Measured in utils(units) 1, 2,3,4,.....



- $MU_3 = TU_3 - TU_2$
- $TU_3 = MU_1 + MU_2 + MU_3$

→ Relationship between TU and MU:

- TU is always positive,
- MU is positive, zero, Negative.
- At first unit $MU=TU$.
- MU is zero & TU is maximum - Point of Satiation.
- MU is negative, TU starts falling- Disutility and stop consumption.

For example:

Quantity	TU	MU
1	20	20
2	34	14
3	45	11
4	50	5
5	50	0
6	46	-4

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CHAPTER 2: THEORY OF DEMAND & SUPPLY

→ Assumption of law of DMU:

- Homogeneity
- Reasonability (standard units)
- Rationality
- Continuous consumption
- No change in price and income.

→ Consumption Surplus:

- What you are ready to pay - what you actually pay.

→ Limitation of consumer surplus:

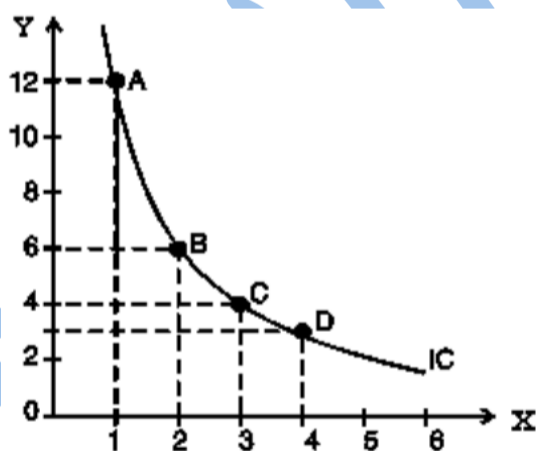
1. Cannot be measured precisely.
2. In the case of necessities, Consumer surplus is always infinite.
3. Consumer surplus derived from a commodity is affected by availability of substitutes.
4. Cannot be measured exactly in terms of money

Hicks and Allen

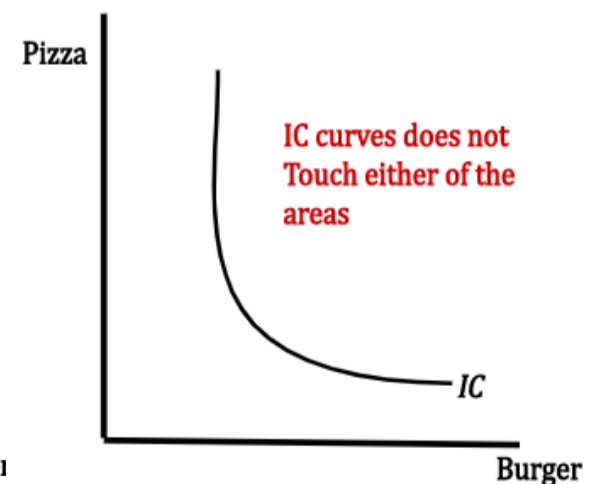
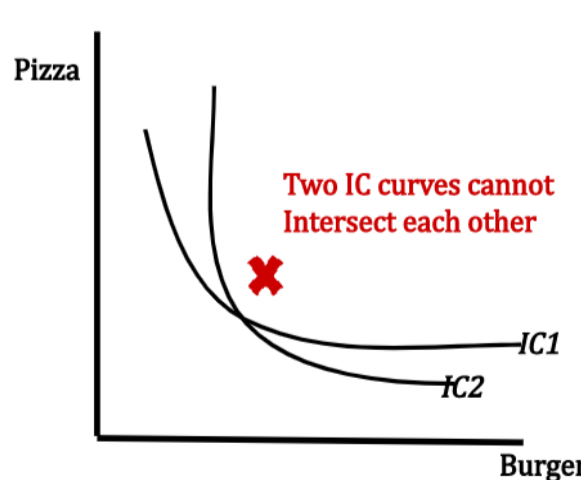
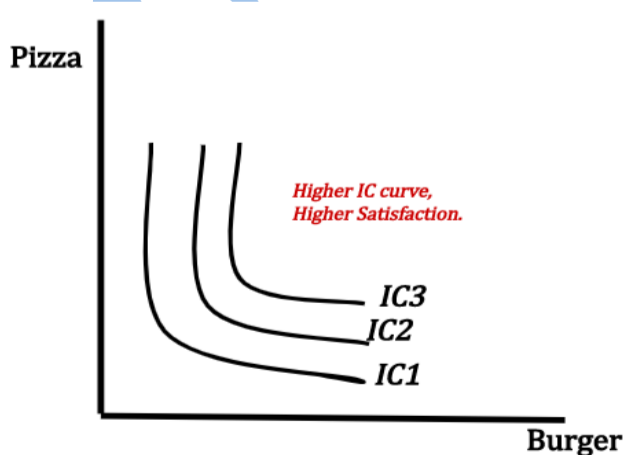
↓
Ordinary Utility

↓
Ranking

→ Indifference curve.



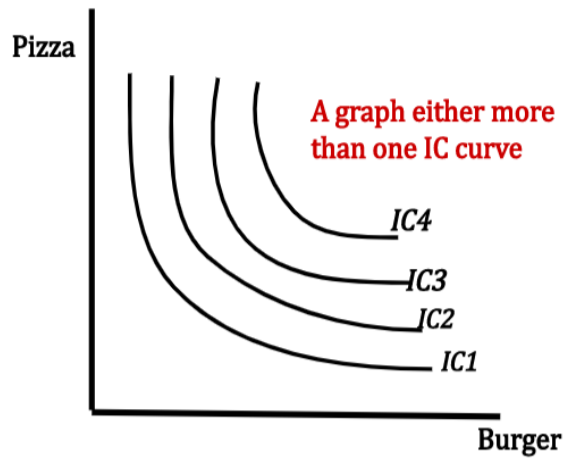
- The IC curve is convex to origin.
- All points on the IC curve are indifferent.
- The IC curve is convex due to declining MRS.



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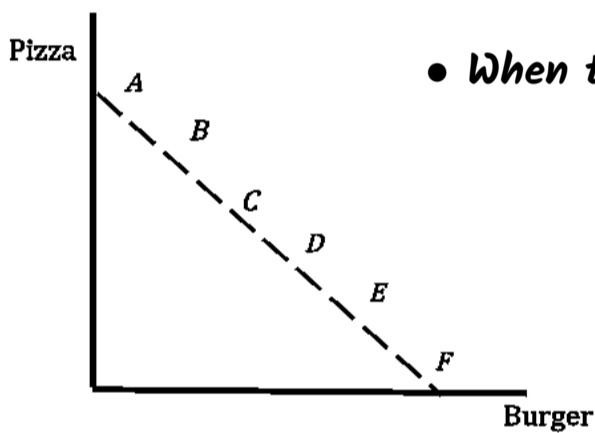
CHAPTER 2: THEORY OF DEMAND & SUPPLY



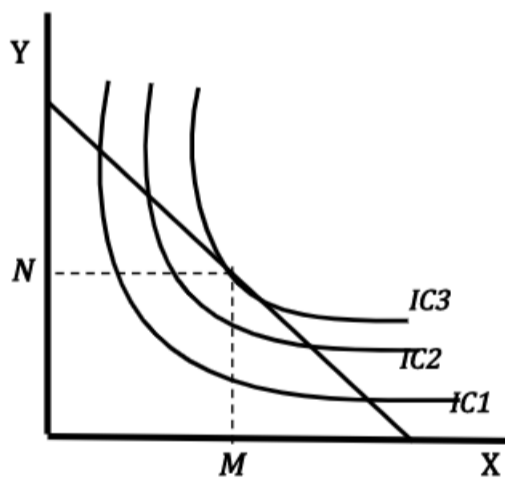
MRS is decreasing - **convex to origin.**

- MRS is increasing - **concave to origin.**
- MRS is constant - **straight line.**

→ Budget Line:



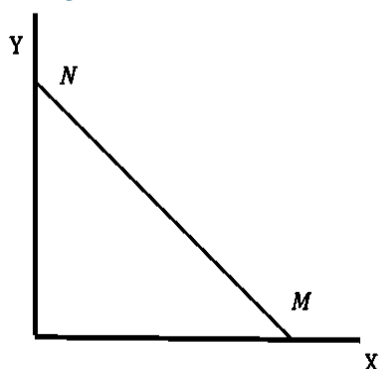
- When the IC curve is tangent to the budget line, it is consumer equilibrium.



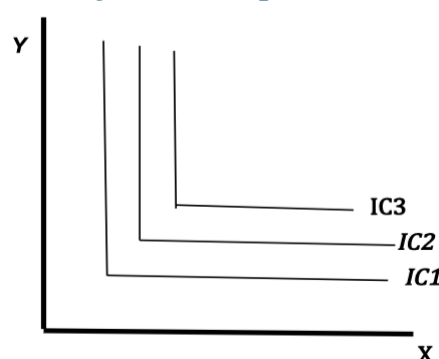
- $MU_x > P_x$ **Continue to Consume.**
- $MU_x = P_x$ **Consumer Equilibrium.** (According Marshall.)
- $MU_x < P_x$ **Stop the Consumption.**

- Consumer equilibrium in case of two or more goods $\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$.

→ Perfect Substitute:



→ Perfect complements



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CHAPTER 2: THEORY OF DEMAND & SUPPLY

- The IC is straight line.

- L- shaped IC curve.

↳ Exceptions of Law DMU.

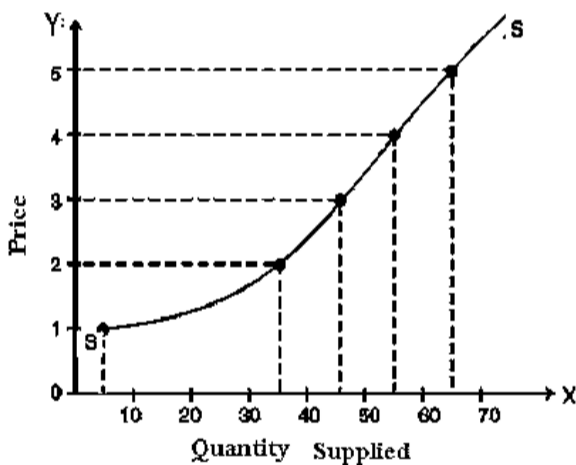
- Money.
- Gold
- Habitual goods
- Necessities.

↳ Supply:

- Supply is offered for sale at a given period of time, available for sale at a relative price.
- Supply is a flow concept.
- Supply is not equal to sale. [Supply Sale]

↳ Law of supply

☐ Other things being constant = $P \uparrow Q \uparrow$
 $P \downarrow Q \downarrow$.



- Upward Sloping.
- Direct Relationship.
- Positive Slope.

↳ Determinants of supply:

• Other factors affecting supply = $Cost \uparrow$ $Profit \downarrow$ $Supply \downarrow$
 $Cost \downarrow$ $Profit \uparrow$ $Supply \uparrow$.

• Government policy

$Tax \uparrow$ $cost \uparrow$ $profit \downarrow$ $supply \downarrow$
 $Tax \downarrow$ $cost \downarrow$ $profit \uparrow$ $supply \uparrow$.

• Subsidy

$Subsidy \uparrow$ $cost \downarrow$ $profit \uparrow$ $supply \uparrow$.
 $Subsidy \downarrow$ $cost \uparrow$ $profit \downarrow$ $supply \downarrow$.

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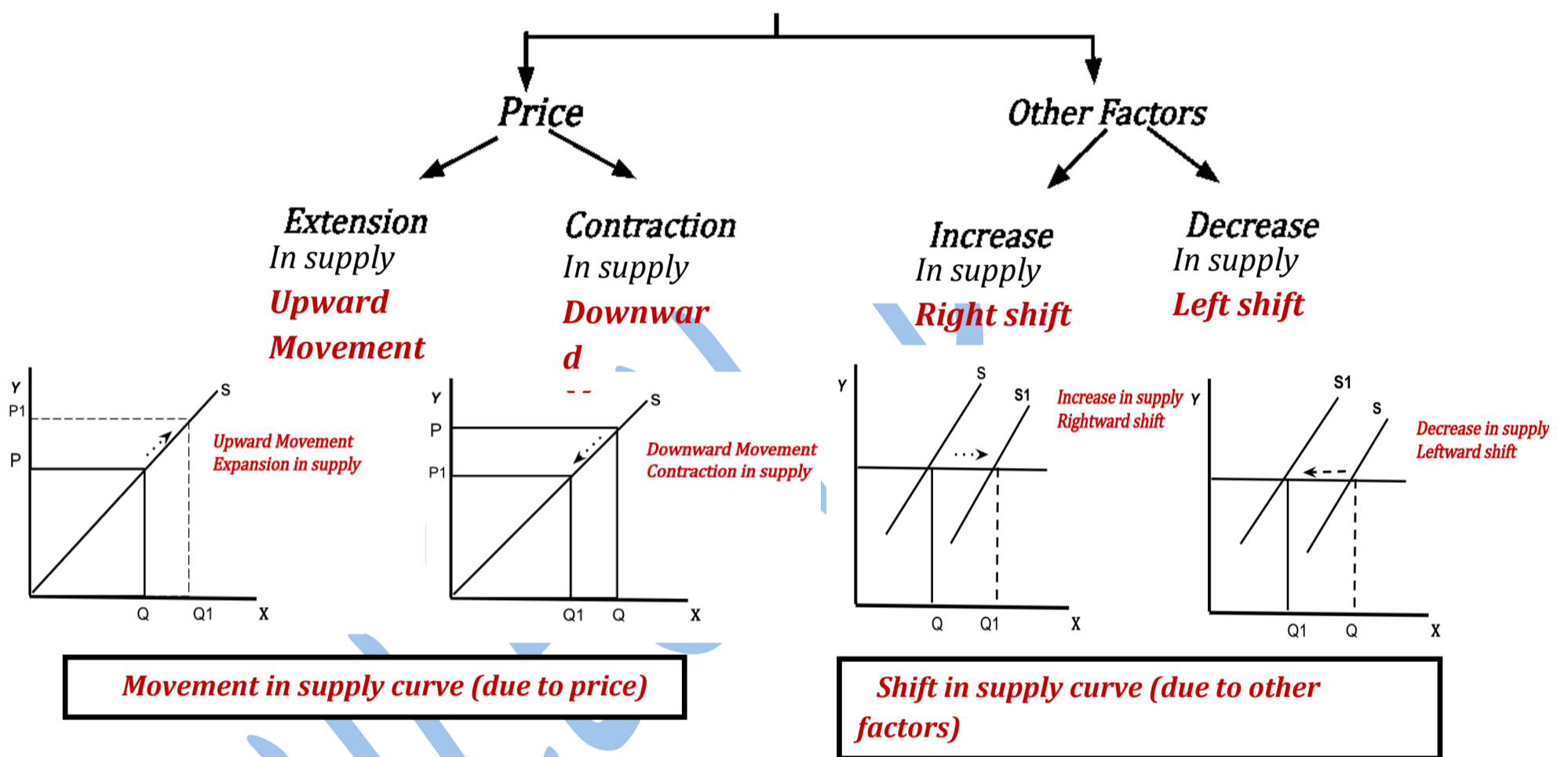
CHAPTER 2: THEORY OF DEMAND & SUPPLY

• Technology

Technology ↑ cost ↓ profit ↑ supply ↑.
 Technology ↓ cost ↑ profit ↓ supply ↓.

• Substitute goods also affect supply:

CHANGE



→ Elasticity

• Responsiveness to change $\frac{\% \text{age Change in supply}}{\% \text{age Change in price}}$

$$e = \frac{\Delta Q_s}{Q_s} \times 100 / \frac{\Delta P}{P} \times 100$$

• Price elasticity:

1. Perfectly elastic $e = \infty$. Horizontal curve
2. Perfectly inelastic $e = 0$. Vertical curve
3. Relatively elastic $e > 1$. Flatter curve
4. Relatively inelastic $e < 1$. Steeper curve.
5. unitary elastic $e = 1$

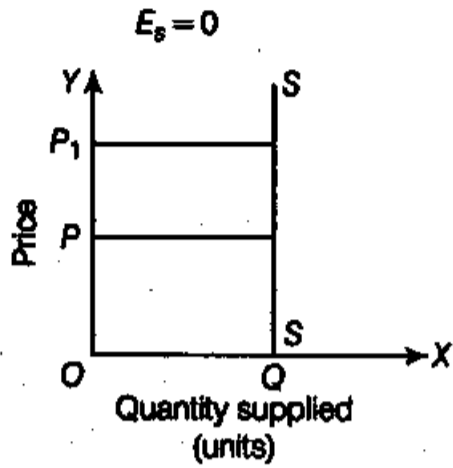
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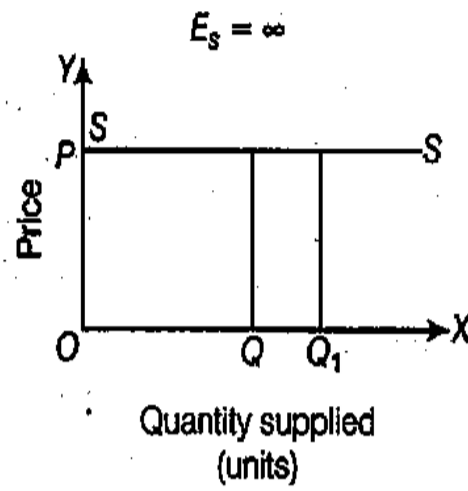
Perfectly inelastic $e = 0$.

Vertical curve parallel to y-axis



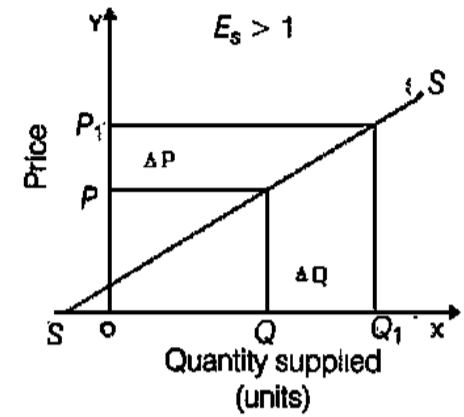
Perfectly elastic $e = \infty$

Horizontal curve parallel to x-axis



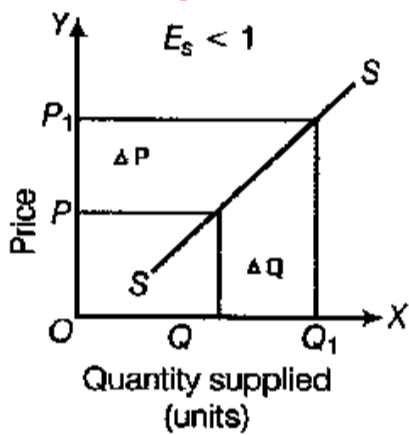
Relatively elastic $e > 1$

Flatter curve

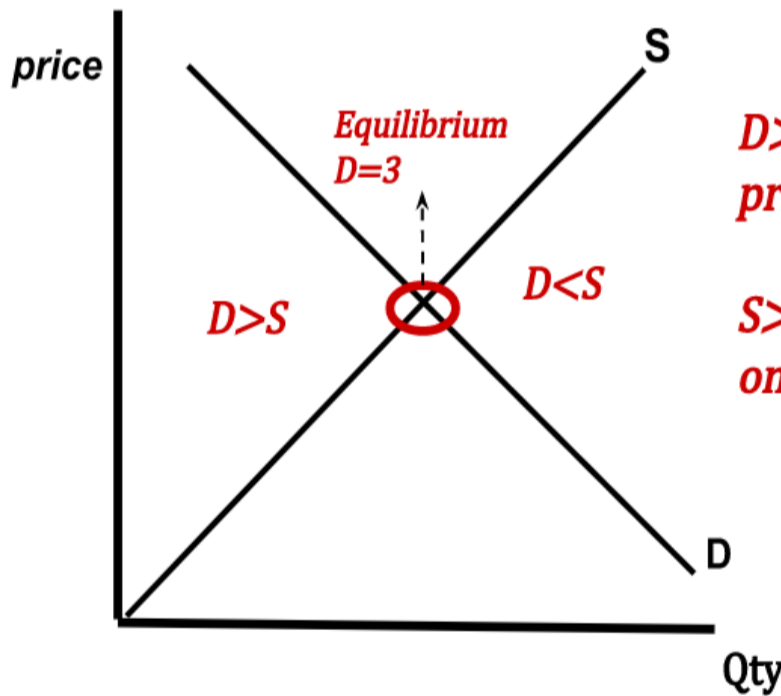
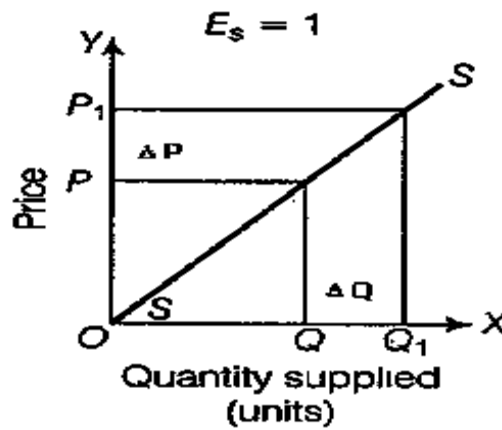


Relatively inelastic $e < 1$

Steeper curve



Unitary elastic $e = 1$



$D > S$ - Upward Pressure on price (price rises).

$S > D$ - Downward Pressure on price (price falls).

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