

Chapter -3

Law & Elasticity of Demand

Meaning & definition of Demand

In general terms, demand means want, wish, will desire etc but in economics "Demand refers to that quantity of commodity which a consumer required or demanded at a particular place, a particular price & a particular point of time.

Demand needs following conditions :-

That commodity is required.

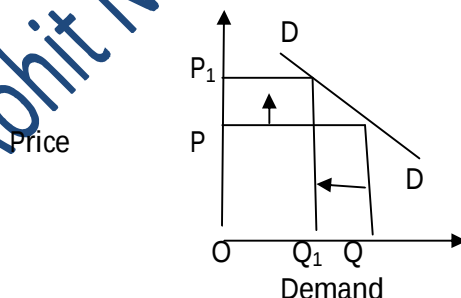
- Consumer should be capable to pay.
- Consumer should have willness to pay
- That commodity should be available in market.

Demand functions:- It express functional relationship between demand of a commodity & factors affecting it. It can be discuss in two parts:-

- a) Individual DE:- It express functional relationship between demand of an individual consumer & factors affection it, symbolically:-
 $D_X = \propto [P_X, P_Y, Y_1, T_1, E_P]$
- b) Market D.F. :- It expresses functional relationship between demand of a market & factors affecting it.
 $D_X = \mathcal{E} [P_X, P_Y, Y_1, T_1, E_P, N, W, D_X, G]$

Determinates of Demand

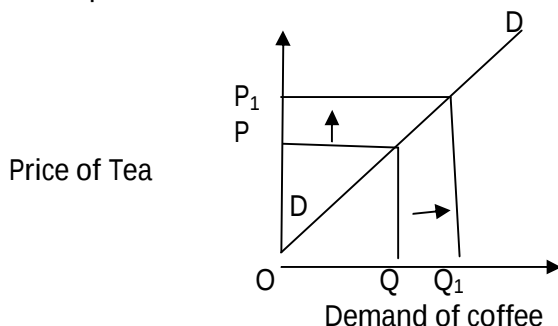
- 1) Price of commodity (P_X) :- when other things remaining the same & price of commodity increases then it's demand falls & vice-versa.



- 2) Price of related goods (P_Y) :- It can be discuss in two parts :-

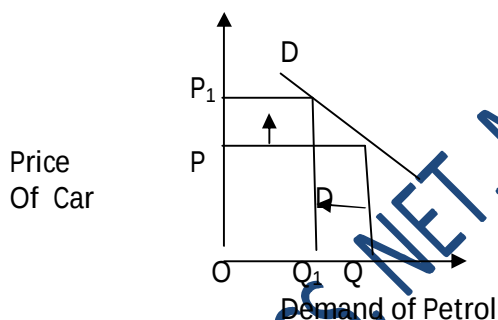
- a) Substitute goods :- These are those goods which are used in place of each other. For eg:- tea & coffee.

When price of tea increases, then demand of coffee also increases & vice – versa.



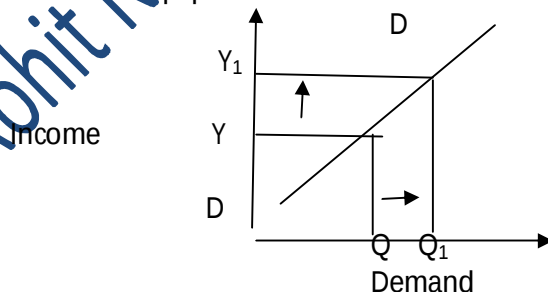
- b) Complementary goods :- These are those goods which are used together. For eg:- car & petrol.

When price of car increases, then demand for petrol falls & vice – versa.

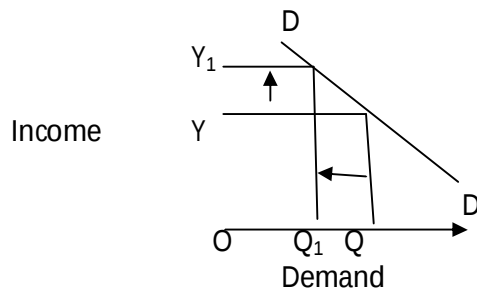


- c) Income of consumer (I) :- It can affect the demand in three categories of goods:-

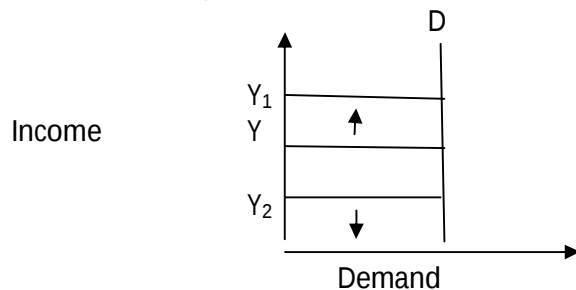
- Normal goods:- These are those goods in which demand increases with the increase in income of the consumers. For eg:- branded clothes, branded shoes, electronic equipment. It's relation is direct.



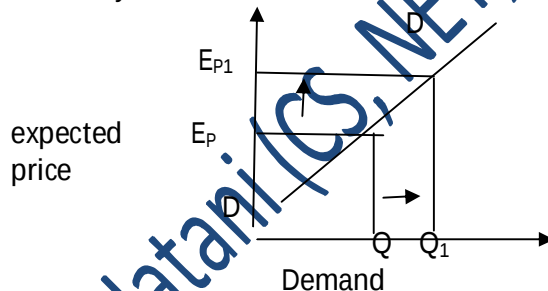
- Inferior goods:- These are those goods in which demand decreases with the increase in income the consumers. Because consumer shift to the better quality goods. For eg:- normal clothes, bicycle, bidi etc. It's relation is inverse.



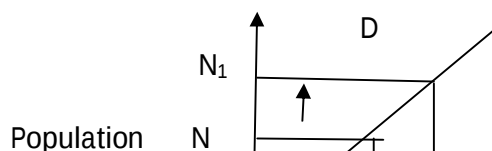
- Necessity goods:- These are those goods in which demand is not affected whatever is the change in income of the consumers for eg:- salt.

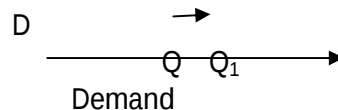


- d) Taste, fashion, habits & choice of consumer (T) :- When a commodity is in the taste & fashion of the consumer then it's demand would increase whatever is the price & income of the consumer. For eg:- jeans & T-shirts etc.
- e) Expected price (E_p) :- When consumer expect high price of a commodity in further, then they will increase the demand at the existing price.



- f) Population (N) :- When other things remaining the same & population increases, then demand of several commodity increases. For eg:- education, hospitals, law, & order. It's relation is direct.





- g) Weather, climate & season :- Demand of several commodities would be high in a particular season & vice-versa. For eg:- woollens, cotton clothes, crackers. Etc.
- h) Distribution of income (D_Y) :- If income distribution is equal, then demand of normal or general goods will be high, on other hand if income distribution is unequal then demand of luxurious good will be high.
- i) Govt. Policies (G) :- When govt. Reduce the tax on the production of commodity, then the demand of the commodity would increase.

Types of Demand :-

- 1) Price or direct demand:- When demand of a commodity discuss with relation of a price, then this is called price demand. For eg:- demand of a pen is 5 units, when it's price is Rs. 10.
- 2) Income demand :- when demand of a commodity is discuss with relations to income of the consumer for eg:- when income of a consumer is Rs. 10,000 then demand of the petrol is 10.
- 3) Cross demand:- when demand of X commodity is discuss with relation to price of Y commodity this is called cross demand. For eg:- when price of tea Rs. 100, demand of coffee is 500 gm.
- 4) Related commodity:
Derived demand:- This is the demand of factors of production which depends upon direct demand. When demand of a commodity is higher then demand of a factor will also be higher & vice-versa. For eg:- if demand of jeans is higher then demand of skilled labor, cotton clothes & machines would be there.

Law of demand:- It explain inverse relationship between price & demand of the commodity i.e. when other things remaining the same & price of a commodity increases then it's demand falls & with the fall in price, demand would increase.

Explanation of law of demand:- It can be explained with the help of demand schedule & demand curve.

- Demand schedule:- It is a tabular presentation between price & demand of a commodity.

- a) Individual D.S :- It expresses price & demand of an individual consumer.

P_x	D_x
1	10
2	8
3	6
4	4
5	2

- b) Market D.S.:- This is the summation of individual demand or this is the demand of all consumers in the market at a given price.

P_x	Demand			
	A	B	C	Market
1	10	15	20	45
2	8	12	16	36
3	6	9	12	27
4	4	6	8	18
5	2	3	4	9

- Demand curve:- It expresses graphic presentation of price & demand of a commodity. It can be discuss in two parts:-
 - 1) Individual D.C.:- It is the diagrammatic presentation of individual demand schedule.

- 2) Market D.C.

Assumption of law of demand:-

- Price of a related goods should not change
- Income of a consumers should not change
- Taste & fashion of consumers should not change
- Population should not change.
- Future expectation should not change
- Weather & climate should not change
- Govt. Policies should not change
- Distribution of income should not change.

Factors responsible for the application of law of demand :

- 1) "Why demand curve slopes downwards."
 - 2) "Why law of demand operates."
- a) Law of diminishing M.U. :- When a consumers consumes a commodity in continuation, then satisfaction received from every next unit keep on diminishing. Because of this law, a consumer is ready to pay less price when more units are demanded. Hence law of demand is applicable.
- b) Income Effect:- When price of a commodity falls then real income of a consumer increases or purchasing power rises. As a result consumer would be able to purchase more units at the gives income & vice-versa. For eg:-

P	Q	Exp.
80	1.25	100
50	2	100

Money income

P	Q	Y
80	1.25	100
80	2	160

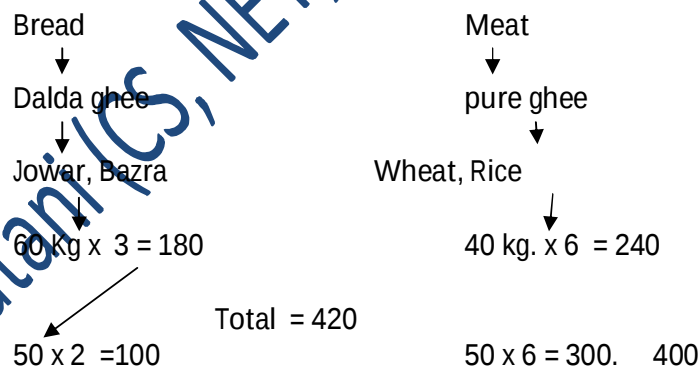
Real Income

P	Q	Y
80	1.25	100
50	2	100

- c) Substitution effect:- When price of a commodity falls, then it is cheaper as compared to its substitute commodity. Hence, its demand will increase due to the diversion of consumers from substitute commodity to main commodity. This is called substitution effect. For eg:- when price of tea falls, then it is cheaper as compared to coffee. Hence demand of tea increases.
- d) No. Of consumers :- when price of a commodity falls then its demand would increase because of two reasons:-
- Existing consumers will increase the demand.
 - New consumers will enter in the market who can't afford earlier. For eg:- computer, color T.V.
- e) Different uses of a commodity :- when price of a commodity falls and if it is used for multiple uses then consumers can increase the demand on other hand, if its price increases then commodity can be put for only important uses. Hence its demand falls. For eg:- milk, electricity.

Exception of law of demand :-

- 1) Giffen goods :- these are those goods in which price effect is positive & income effect is negative. As a result a consumer will prefer to shift on the better substitute commodity. Hence, demand of the commodity would decrease. In brief, we can say that consumer will prefer always to go on a better quality goods, for eg:- jowar, bazra, vanaspathi ghee etc.



- 2) Necessity goods:- These are those goods which are necessity for consumer, hence demand is unaffected whatever the change in price. For eg:- salt, newspaper, milk, text-book etc.
- 3) Prestigious goods:- These are those goods which are purchased by the consumers to improve their prestige in the society. Demand of these goods will be high at higher price. For eg:- luxury cars expensive jewellery, luxury carpet. Etc.
- 4) Ignorance:- most of consumers take higher price means better quality. In this case, demand would be higher at higher price. For eg:- clothes, vegetable, electronics etc.

Change in demand & change in quantity demanded :- Demand of a commodity is affected by many factor such as price of the commodity govt. Policies etc. If demand of a commodity is affected by price then this is called change in quantity demanded. On other factors then this is called change in demand.

A. Change in Quantity demanded :- It can be discuss in two parts :-

a) Extension of demand :- when demand of a commodity is increased due to following price, then this is called extension of demand.

b) Contraction of Demand :- when demand of a commodity is decreased due to increase in price then this is called contraction of demand.

Movement along the demand curve:- When demand of a commodity change due to change in price then this is called movement along the D.C.

B. Change in demand:- when demand of a commodity is changed not due to price, but due to other, other factors, then this is called change in demand. It can be discuss in two parts:-

- a) Increases in demand :- When demand of a commodity is increased not due to price, but due to other factors, then this is called “increase in demand”.

- b) Decrease in demand:- when demand of a commodity is decreased not due to price but due to other factors, then this is decreases of demand.

Shifting of demand curve:- when demand of a commodity is changed, not to price but due to other factors, then this is called shifting of demand curve.

Elasticity of demand :- law of demand simply explain inverse relation between price & demand of a commodity. Price increase, then quantity demand is fall & vice-versa, but is doesn't explain the extent to which demand of a commodity is changed due to change in price.

Ed:- proportionate change in demand
proportionate change in price

Degrees of price elasticity of demand:-

- Perfectly elastic :- when demand of a commodity is that much flexible that it keeps on changing without any change in price then this is called perfectly elasticity.
- Highly elastic demand :- when proportionate change in demand is greater than proportionate change in price then this is called highly elastic demand .

A		B		C	
P_x	D_x	P_x	D_x	P_x	D_x
5	10	5	20	5	30
6	8	6	18	6	28

High demand = CBA

High elastic demand = ABC

- Unitary elastic demand :- When proportionate change in demand is equal to proportionate change in price then this is called unitary elastic demand.

- High inelastic demand :- when proportionate change in demand is less than proportionate change in price, then elasticity of demand is less than unitary.
- Perfectly inelasticity demand :- when there is no change in demand, irrespective of any change in price, then this is called perfectly inelastic demand.

Methods to measure price elasticity of demand:-

- Total exp or total outlay method
 - Proportionate or percentage method
 - Point or graphic method
-
- Total exp or total outlay method :- In this method we measure elasticity of demand with the keeps of relationship between price & total expenditure. In this we will find out 3 possible directions of change in total exp with the change in price. These direction are as follows:-

- More than unitary :- when price & total exp moves in the opposite directions, then elasticity of demand is more than unitary.

P_x	D_x	TEx.
↓ 5	20	100 ↑
4	26	104

- Less than unitary:- when price & T.E. moves in the same direction then elasticity of demand is less than unitary.

P_x	D_x	T.E.x.
↓ 5	20	100 ↓
4	24	96

- Unitary elastic :- when T.E. remains constant, what ever is the change in price then elasticity of demand is unitary

P_x	D_x	T.E.x.
↓ 5	20	100
4	25	96 →

Diagrammatic presentation of T.E. method

P_x	D_x	T.E.x.	
1	10	10	Ed < 1
2	9	18	
3	8	24	
4	7	28	
5	6	30	Ed = 1
6	5	30	
7	4	28	Ed > 1
8	3	24	
9	2	18	
10	1	10	

- Proportionate or per method:- in this method, we measure the elasticity of demand by dividing proportionate/ per change in demand to proportionate/ per change in price.

$$Ed = \frac{\text{proportionate /percentage change in demand}}{\text{proportionate /percentage change in price}}$$

$$ed = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}}$$

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

Num 1. When P of a commodity is Rs. 5, then demand is 40 units, when P increases to Rs. 6, then demand falls 35 units. Cal elasticity?

$$\begin{aligned} Ed &= \frac{5}{40} \times \frac{5}{1} \\ &= \frac{25}{40} \\ &= \frac{5}{8} \\ &= 0.06, ed < 1 \end{aligned}$$

Num 2 P of a comm. Is Rs. 10, then demand is 100 units.
When p increase to 12.5, then demand falls 50 units cal elasticity?

$$Ed:- \frac{50}{100} \times \frac{10}{2.5}$$

$$\begin{aligned} &= 2 \\ Ed &> 1 \end{aligned}$$

Num 3 When P of a comm. Is Rs. 10, then it's demand is 40 units. If falls to Rs. 5 that should be demand, if elasticity is 0.5?

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

$$0.5 = \frac{\Delta Q}{40} \times \frac{10}{5}$$

$$\Delta Q = 20 \times 0.5$$

$$= 10$$

$$Q \text{ at Rs. 5} = 40 + 10 = 50$$

Num 4 When price of a comm. Is Rs. 2, then D of a consumer is 20 units. At what P demand should be 17 units, if ed = 0.5?

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

$$0.5 = \frac{3}{20} \times \frac{2}{\Delta P}$$

$$\Delta P \cdot 0.5 = \frac{3}{10}$$

$$\Delta P = \frac{3}{10 \times 0.5}$$

$$= \frac{3}{5}$$

$$= 0.6$$

$$P \text{ at 17 units} = 2 + 0.6 \\ = 2.6$$

Num 5. When P of a comm. Falls by 10%, it's demand increases 40 to 45 units. What will be the elasticity of demand ?

$$\begin{array}{cc} P_x & D_x \\ \text{By 10\%} & 40 \text{ to } 45. \end{array}$$

$$Ed = \frac{\% \text{ change in } D_x}{\% \text{ change in } P_x}$$

$$= \frac{5}{10} \times 100$$

$$= \frac{40}{10\%} \times \frac{12.5\%}{10\%}$$

$$= 1.25, ed > 1$$

Num 6 A consumer pur 40 units at Rs. 5, how many units a consumer should pur at Rs.4, if ed = 1.5?

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

$$1.5 = \frac{\Delta Q}{40} \times \frac{5}{1}$$

$$\Delta Q = 8 \times 1.5 = 12$$

$$Q \text{ at Rs. 4} = 40 + 12$$

$$= 52$$

Num 7 When P of a commodity is Rs. 5, then T.E is Rs 500. When P increases to Rs. 6 what should be the total exp if ed = 1.25

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

$$1.25 = \frac{\Delta Q}{100} \times \frac{5}{1}$$

$$\Delta Q = 1.25 \times 20 = 25$$

$$Q \text{ at Rs. 6} = 75 \times 6 = 450$$

Num 8 A dentist was charging 300 for standard climic, then total Rev. Is 30,000 Rs. P.m. If he increases the charges to Rs. 350, then few customers turn down. As a result total rev. Is Rs. 33,250 cal ed ?

Working notes :

Px	Dx	T.R
300	100	30,000
350	95	33,250

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

$$Q \quad \Delta P$$

$$\frac{5}{100} \times \frac{300}{50} = 0.3$$

Num 9 If P of comm. Is Rs. 5 then D is 20 units if P falls to Rs. 4 then what should be the demand. If $ed = -1.5$?

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

$$-1.5 = \frac{\Delta Q}{20} \times \frac{5}{-1}$$

$$\Delta Q = -1.5 \times -4 = 6$$

$$Q \text{ at Rs. 4} = 20 + 6 = 26$$

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

$$-1.5 = \frac{\Delta Q}{20} \times \frac{5}{-1}$$

$$-1.5 = \frac{\Delta Q}{4} \quad \Delta Q = -6$$

$$Q \text{ at Rs 6} = 20 - 6 = 14.$$

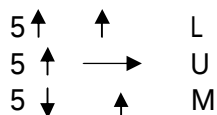
Num 10 : Compare the elasticity of D in following case:-

- A 3% fall in P increase D by 9%
- B 5% increase in P, decrease D by 5%
- C 8% increase in P, increase T.E by 8%

$$\begin{aligned} A \quad ed &= \frac{\% \text{ change in } Dx}{\% \text{ change in } Px} \\ &= \frac{9}{3} \\ &= 3 \end{aligned}$$

$$\begin{aligned} B \quad ed &= \frac{\% \text{ change in } Dx}{\% \text{ change in } Px} \\ &= \frac{5}{5} \\ &= 1 \end{aligned}$$

C If P & T.E. moves in the same direction, then ed is always less than unitary.



Num 11 There are two commodity X & Y. X's price falls by 5% & Y's price increases by 5%. What will be their change in D, if Ed of X is twice that of Y.

		X		Y
% ΔP	$\longrightarrow$	5%	$\downarrow$	5%
% ΔD	$\longrightarrow$	10%	$\uparrow$	5%
Ed		2		1

$$Ed_x = \frac{\% \text{ change in } D_x}{\% \text{ change in } P_x}$$

$$2 = \frac{\Delta D_x}{5\%}$$

$$\Delta D_x = 10\%$$

$$Ed_x = \frac{\% \text{ change in } D_x}{\% \text{ change in } P_x}$$

$$1 = \frac{\Delta D_y}{5\%}$$

$$\Delta D_y = 5\%$$

3. Point or graphic method :- In this method we measure Ed on a straight line demand curve joining both axis, one side it is joint by x-axis & other side, it is joint by Y-axis. Elasticity is measured with the help of following formula :-

$$Ed = \frac{\text{Lower portion of demand curve}}{\text{Upper portion of demand curve}}$$

Factor affecting Price Elasticity :-

- 1) Nature of a commodity :- In case of necessity Ed is less than unitary (salt, text-book, food). In case of comforts, it is unitary (air-cooler motor bike etc.) whereas in case of luxurious goods it is more than unitary (A.C, luxury car).
- 2) Availability of substitute :- when a particular commodity have many substitute in the market then it's Ed is more than unitary, because consumers will have a choice & they will divert towards the consumption of other commodities for eg:- LG, BPL, Samsung etc.
- 3) Postponement of the consumption :- When consumption of a commodity can be postpone, then it's Ed will be high because consumer can purchase a commodity after some time for eg:- if construction of house can be postpone if the price of steel & cement is high.
- 4) Proportion of income strength : If a consumer spends very less proportion of their income on a consumption of the commodity (newspaper, salt, etc), then $Ed < 1$. On

other hand, if a consumer spends very large proportion of their income on the consumption of a commodity (Petrol, clothes etc), then ed will be high.

- 5) Different uses of a commodity :- if a commodity can be put for multiple uses (milk, electricity, wood etc) then ed would be high because consumer can change the consumption when price change.
- 6) Income of the consumer :- If level of income of consumer is very high & very low then $ed < 1$. On the other hand in case of middle income group, $ed > 1$ or very high.
- 7) In case of taste fashion & habit of the consumer, when a commodity is in taste & fashion of the consumer, then its ed is less than unitary. For eg : cigarettes, tobacco, jeans, T-shirt etc.

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