

HUT300 Industrial Economics & Foreign Trade

Module 1 (Basic Concepts and Demand and Supply Analysis)

Scarcity and choice - Basic economic problems- PPC – Firms and its objectives – types of firms – Utility – Law of diminishing marginal utility – Demand and its determinants – law of demand – elasticity of demand – measurement of elasticity and its applications – Supply, law of supply and determinants of supply – Equilibrium – Changes in demand and supply and its effects – Consumer surplus and producer surplus (Concepts) – Taxation and deadweight loss

1.1 Microeconomics

The subject matter of Economics has been divided into two parts. - Microeconomics and Macroeconomics. Microeconomics studies the economic behaviour of individual economic units. It includes analyzing the behaviour of households and firms at the micro level. It studies the demand of individual consumers for goods and their equilibrium state. It studies the behaviour of individual firms in regard to the fixation of price and output. It is concerned with how the individual consumer distributes his income among various products and services so as to maximize utility. It is concerned with the theories of product pricing, factor pricing and economic welfare.

Applications of Microeconomics

1. It is helpful in the formulation of economic policies that will promote the welfare of all.
2. It teaches how a free market economy with its millions of consumers and producers work to decide about the allocation of resources among the various goods and services.
3. It studies how goods are distributed among the various people for consumption through the price mechanism.
4. Microeconomic theory shows that optimum welfare is achieved when there is perfect competition in product and factor markets.
5. It also helps in the formulation of economic policies calculated to promote efficiency in production to ensure the welfare of the people.

1.2 Scarcity and Choice

Scarcity

Scarcity is one of the fundamental and basic concept in Economics. The scarcity definition of Economics was put forward by Lionel Robbins. It refers to the lack of resources to satisfy all human wants.

An economy has to decide how to use its scarce resources to produce various commodities. If it decide to use more resources in one line of production, then resources must be withdrawn from the production of some other goods.

Even though it is expected that the problem of scarcity will disappear as an economy grows, the wealthiest economies in the world, even today face the problem of scarcity as their present wants run ahead of their increased resources and capacity to produce.

The scarcity of resources also compels an economy to decide how the different commodities should be produced. The method of production adopted should be one that makes the best possible use of the available resources.

Choice

Choice emanates from scarcity. An economy faces the problem of choice since there are a large number of wants to be satisfied with limited resources. The economy does not have the resources to produce all the commodities in abundant quantities to satisfy all of its people. It has to make a choice regarding the quantity of different commodities that is to be produced.

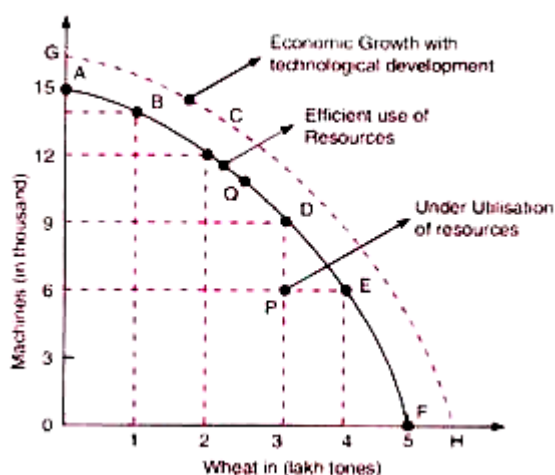
A choice also has to be taken regarding who should get how much from the national output. This means how the national product is distributed among various members of a society.

Explaining scarcity and choice using the Production Possibility Curve

The problem of scarcity and choice can be explained using the PPC. A, B, C, D, E and F represent various combinations of machines and wheat available to the economy.

A and F are possibilities where the economy spends all of its resources on either machines or on wheat. Possibilities B, C, D and E lie in between. The economy must rationally choose where on the PPC they want to be since all points are mutually exclusive. Due to the scarcity of resources, the country has to choose at what point on the PPC it should produce so as to maximize social welfare.

Possibility	Machines	Wheat
A	5	0
B	4	5
C	3	8
D	2	11
E	1	13
F	0	15



1.3 Basic Economic Problems

Every economy faces three basic and fundamental economic problems. The economy must first of all decide what all products are to be produced, how these commodities are made and finally decide for whom these are to be produced. The issue arises due to the scarcity of resources and the ever-increasing quantity of products that are demanded.

1. What to produce

The economy has to decide what all commodities and services it will produce. An economy wants many things but it is not possible to make everything with the available resources. It also has to settle on the quantity of various products that is to be produced. Should it produce food or machines? Should scarce resources be used to produce more electronic gadgets or should it be used to produce electric power plants which will ensure industrial growth tomorrow?

2. How to produce

The second central problem faced by any economy is to determine the production techniques that will be used to produce different products. This problem arises because the same commodity can be produced using different technologies. Should electricity be generated from coal, oil, thermal or nuclear? Should factories use labour intensive or capital-intensive techniques? Commodities would be produced by employing those techniques which maximize output at the minimum cost.

3. For whom to produce

An economy produces commodities for use and hence it has to decide the final users of various commodities. It also has to decide as to who gets the benefit of economic activity. A country may produce a large number of low-cost products meant for all or it may produce a few products meant for luxurious consumption.

This problem is concerned with the distribution of the national product in a fair and equitable manner. An answer to this question depends largely on the policies of the government.

Apart from these fundamental issues, modern economies have to solve three more basic problems.

4. The problem of economic efficiency

Production is said to be efficient if the resources are utilized in such a way that through reallocation it is impossible to produce more of one good without reducing the output of any other.

5. The problem of full employment of resources

Full employment would occur when all the available resources of a country are fully utilized. Countries go through situations where people are searching for work and factories

are lying idle but manufacturing does not take place. This is particularly severe during times of recession.

6. The problem of economic growth

An economy has economic growth only when its productive capacity to produce more and more goods and services increases over time. Such a country will constantly witness an increase in the standard of life of the people.

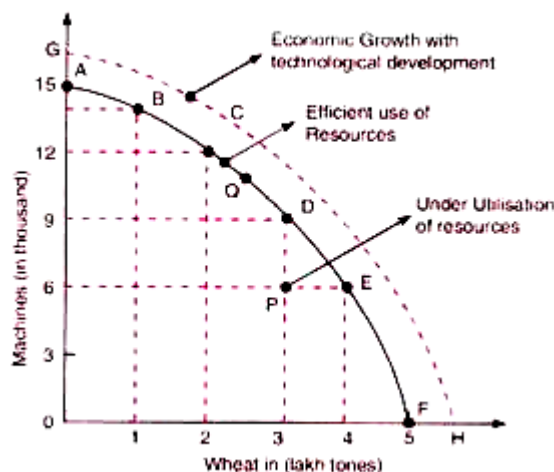
1.4 Production Possibility Curve

The PPC is a graphical representation of the alternative production possibilities facing an economy. Since the total resources of the economy are limited, it has to decide what to produce with the limited resources. It has to make a choice regarding the quantity of different commodities. If there were unlimited resources, the economy could have produced all that it wanted. It is also referred to as the *production possibility frontier* since it shows the maximum that can be produced with the available resources.

For example, consider an economy which produces only two goods, guns and butter. The guns represent military spending and the butter stands for civilian spending. Here there are two extreme cases. If all the resources are utilized for butter, then no guns can be produced and vice versa. The various possibilities of producing the products are represented by the following schedule.

Possibility	Machines	Wheat
A	5	0
B	4	5
C	3	8
D	2	11
E	1	13
F	0	15

In the above schedule A and F are possibilities where the economy either produces 100 percent of machines or 100 percent of wheat. Possibilities B, C D and E lie in between. It can be seen that for an economy to have more machines it must be willing to sacrifice more of wheat. For instance, to reach possibility B from A, the economy produces 5 more units of wheat by sacrificing 1 unit of machine.



The curve represents the production possibilities of an economy and shows the various possible combinations of the two goods. The curve gives the maximum amount of machines that can be produced in the economy for any given amount of wheat and vice-versa. The production possibility curve is also known as *transformation curve* since it shows the rate of transformation of one product into the other when the economy moves from one possibility point to the other.

All possible combinations lying on the production possibility curve show the combinations of the two goods that can be produced using the available resources. Any combination lying inside the production curve such as P in the figure indicates that resources are not being fully employed in the best-known way. Any point outside the production possibility frontier, such as Q implies that the economy does not have adequate resources to produce this combination.

Shift of the PPC

A shift of the production possibility frontier indicates economic growth and development. In the above instance, the production possibility frontier has shifted to GH on account of improvements in technology or due to an increase in the resources available to the economy.

The PPC is an important tool that can be used to understand basic concepts like scarcity, choice, resource allocation, opportunity cost and trade off.

1.5 Firms and its objectives

A firm is a specialised organisation devoted to managing the process of production. It utilises the factors of production like land, labour, capital and organisation to produce various goods and services.

Objectives of a firm

Each firm decides its own objectives and evolves strategies to fulfil it. The different objectives that firm pursue are:

1. Profit Maximisation

The primary objective of most firms is the maximisation of its profit. No business firm can survive without earning sufficient profits. Profits bring in the resources needed for expansion and diversification. It is the monetary benefit given to the shareholders of the firm. Profit is defined as the difference between total revenue and total costs.

$\text{Profit} = \text{Total Revenue} - \text{Total Costs}$

The marketing and sales managers try to maximise the total revenue while the production and manufacturing managers try to minimise the total costs.

2. Sales Maximisation

Firms often try to maximise their sales and increase their share of the market. According to Prof. Baumol most managers try to maximise sales revenue since their earnings are more dependent on sales revenue rather than on profits. Such a strategy may be beneficial in the long run since it increase the monopoly of the company in the market enabling the firm to sell at higher prices. However, in the long run this may also result in profit maximisation.

3. Growth Maximisation

Firms also work towards maximising their growth rate. A higher rate of growth automatically increases the level of output of the firm. It will also result in more revenue, profit, number of employees, market share and number of products. Such firms will be more dynamic and competitive since they are always on the lookout for better opportunities. They are also likely to invest more in technology and research.

4. Welfare Maximisation

A firm may also aim to maximise the welfare of the society. Such a firm tries to supply good quality products at fair prices. They will take reasonable steps to protect the environment. Many firms engage in setting up schools, sports complexes charitable organisations, hospitals and take steps to increase employee welfare.

5. Profit Satisficing

It is the economic strategy of focusing on achieving satisfactory profits rather than maximising profits. The primary interest of the shareholders is dividends. They are rarely interested in the day-to-day operations of the company. However, managers do not get a share of dividends and have less motivation to maximise profits. Hence managers may achieve a satisfactory level of profits to keep shareholders happy and then focus on other goals like improvement of working conditions.

6. Stability

Stability is essential for the firm's survival in the long run. A stable firm can easily handle the changing market dynamics and will have a high level of customer and employee satisfaction. It will be able to quickly adapt to difficult situations like falling demand for its products, bad debts, technological obsolescence and declining customer confidence.

To conclude the ultimate objective of all firms is profit maximisation. It can be seen that all of the above objectives go together and a firm which is able to achieve high sales or rapid growth would be rewarded with high profits. In the long run profit maximisation, sales maximisation and growth maximisation will converge into a single objective.

1.6 Types of Firms

1. Sole Proprietorship

It is the type of firm owned, managed and controlled by a single individual or the proprietor. It is suitable where the nature of the market is limited, localised and where customers give importance to personal attention. Most of the small businesses are of this type. The debts of the firm are the personal responsibility of the owner e.g. handicrafts, jewelry, tailoring etc.

Advantages

- a. They require low capital investment and offers personalised service.
- b. Such firms are able to take quick decisions and have flexible operations.
- c. The partners share profits in the ratio as agreed.
- d. There are less legal formalities

2. Partnership firms

These are firms owned by two or more individuals who share profits as well as liabilities of the firm. It comes into existence through a legal agreement in which terms and conditions governing the relationship among partners, the manner of conducting the business and sharing of profits and losses are specified. Such firms are suitable for small businesses. e.g. retail trade, small manufacturing units, professional services etc.

Advantages

- a. Such firms are able to collect more resources than the proprietorship.
- b. Persons with different skill, expertise, managerial talent and resources can come together to form a business.
- c. The partners share among themselves the responsibility of decision making.
- d. The partners share profits in the ratio as agreed.

3. Joint Stock Company

It is a business organisation owned by a number of individual stockholders. Today most of the business activity in the country is carried out by joint stock companies. It has a separate legal identity and can borrow money and make investments on its own behalf. The ownership of a company is determined by the ownership of the company's shares. The shareholders get dividends in proportion to the shares owned by them. They elect directors and vote on important issues. They are the dominant type of business organisation since they are an extremely efficient way to engage in business.

A company has two basic forms.

(a) Private Limited Company. The maximum number of shareholders is limited to fifty. The shares of the company are transferable only among the members and it cannot raise capital by selling its shares to outsiders.

(b) Public Limited Company. There is no limit on the maximum number of members. It has to annually submit its balance sheet to the Registrar of Joint Stock Companies. It can invite the public to buy shares by issuing a prospectus. However its business cannot be started unless the minimum capital laid down as per law has been subscribed.

e.g. Infosys, Microsoft, Tata Motors

Advantages

- a. A company is a legal person that can conduct business.
- b. The owners have only a limited liability.
- c. The shareholders own the corporation but the managers run it, hence decision making is very quick and precise.
- d. Since the number of shareholders is very large, they can collect huge financial resources.

4. The Cooperatives

The cooperative society is a voluntary association of persons who join together for the welfare of the members. Their objective is to protect their economic interests and prevent exploitation. The profit generated is distributed among the members as per the legal agreement. Here decisions are taken by an elected managing committee e.g. AMUL, Kerala State Cooperative Bank, KCMF etc.

Advantages

- a. Each member has only one vote irrespective of the amount of capital contributed.
- b. The liability of the members is limited to their capital contribution.
- c. Since the producers themselves are members of the society cost of production can be minimised.
- d. The cooperatives enjoy governmental support.

5. The Public Sector

Public sector undertaking (PSU) refers to a government owned company. The primary objective is to provide services to improve the welfare of the people. In most countries it includes services like police, military, public roads, infrastructure, education and healthcare.

Advantages

- a. Not guided by profit motive.
- b. Creation of employment opportunities.
- c. Access to huge governmental finances.
- d. Investment can be made in sectors which are socially desirable.

1.7 Utility

In ordinary language, utility means usefulness. In Economics, utility is defined as the power of a commodity or a service to satisfy a human want. Alfred Marshall is the chief exponent of the utility approach.

Utility is a subjective concept. The same commodity gives different utilities to different people. Warm clothes have little utility for the people in hot countries. So, utility depends on the consumer and his need for the commodity.

Total Utility

Total Utility refers to the sum of utilities of all units of a commodity consumed. For example, if a consumer consumes 3 cups of coffee, then the total utility is the sum of the utility from all the three cups.

Marginal Utility

Marginal Utility is the addition made to the total utility by consuming one more unit of a commodity. For example, if a consumer consumes 3 cups of coffee, the marginal utility is the utility derived from the 3rd unit. It is the total utility of 3 cups minus the total utility of 2 cups of coffee.

$$MU_n = TU_n - TU_{n-1}$$

Law of Diminishing Marginal Utility

The law of diminishing marginal utility explains an ordinary experience of a consumer. If a consumer takes more and more units of a commodity, the additional utility he derives from an extra unit of the commodity goes on declining. i.e. the marginal utility decreases with the increase in the consumption of a commodity. When marginal utility decreases, the total utility increases, but at a diminishing rate.

This Law is also known as Gossen's I Law.

Statement of the law

The Law states that as a person gets more and more units of a commodity, marginal utility from each successive unit will go on falling till it becomes zero or negative. According to Alfred Marshall, "the additional benefit which a person derives from a given increase of his stock of a thing diminishes with every increase in the stock that he already has".

Assumptions of the Law

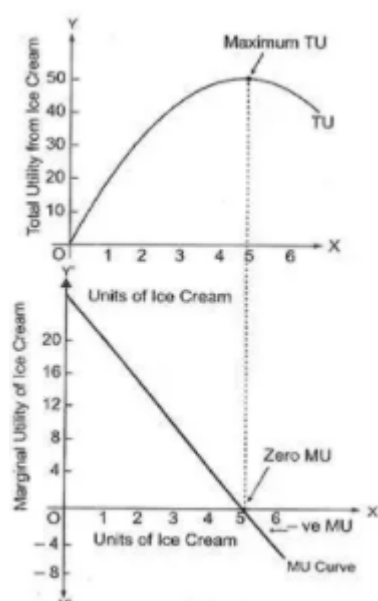
1. The units of the commodity must be of a standard size.
2. All the units of the commodity must be identical in all aspects like taste, quality, colour and size.
3. The law works only when the process of consumption continues without any time gap.
4. The consumer's taste, habit or preference must remain the same during the process of consumption.
5. The consumer is assumed to be rational. As a rational consumer, he wants to maximise the total utility.
6. Utility is measurable.

Relationship between total and marginal utility

Suppose Mr X purchases the same product one by one continuously. The first unit gives him higher utility, when he buys the second, the extent of his utility will reduce. If he continues to take additional units, the utility derived from the third unit will be less than that of the second one. In this manner, the marginal utility from the extra units will go on

decreasing. If the consumer continues to take more units, marginal utility falls to zero and then becomes negative.

Quantit y	Total Utility	Marginal Utility
1	20	20
2	30	10
3	38	8
4	45	7
5	45	0
6	41	-4



From the table it is clear that the marginal utility goes on declining when successive unit of the same product is consumed. The consumer derives 20 units of utility from the first unit that he consumes. When he consumes the product continuously, the marginal utility falls to 7 unit for the fourth and becomes zero for the fifth unit. The marginal utility is negative for the 6th unit. Thus, marginal utility declines at first, reaches zero and then becomes negative.

The relationship between Marginal and Total Utility can be summarised as:

When marginal utility declines, total utility is increasing.

When marginal utility reaches zero, total utility is a maximum.

When marginal utility becomes negative total utility starts declining.

Limitation of the Law

1. Deriving utility is a psychological experience. When it is said that a unit of X gives ten units of utility, this means that utility can be measured precisely. In reality, utility cannot be measured.
2. The Law is based on a single commodity consumption mode. That is, a consumer consumes only one good at a time. In real life, a consumer consumes more than one good at a time.

3. According to the Law, a consumer should consume successive units of the same good continuously. This is an unrealistic assumption.
4. The Law assumes that the marginal utility of money is constant. This assumption has been severely criticised.
5. As utility itself varies from person to person, marginal utility derived from the consumption of a good cannot be measured precisely.

Importance of the Law

1. The law of diminishing marginal utility is the foundation for various other economic laws. For example, the law of demand is the result of the operation of this law. As utility falls, the consumer is willing to pay only a lower price for successive purchases.
2. This law is a handy tool for the finance minister for increasing tax rate for the rich.
3. Producers are guided by the operation this law. They constantly change the design, the package of their goods so that the goods become more attractive to the consumers and they appear as new goods.
4. Consumers are also guided by this law when they make their purchases. They always try to purchase a wide variety of products.

1.8 Demand

The demand for a commodity at a given price refers to the quantity of it that will be purchased per unit of time at that price in the market. It is the desire for a product backed by the ability to pay and willingness to purchase it. It depends mainly on the price at which the commodity is sold.

Determinants of Demand (Factors influencing Demand)

1. Price of the product.
2. Level of income of the consumer.
3. Price of related goods.
4. The taste, habits and preferences of the consumer.
5. Changes in technology.
6. Changes in government policy.
7. Population of the region.
8. Advertisement.
9. Climate and weather conditions in the region.

Demand Schedule

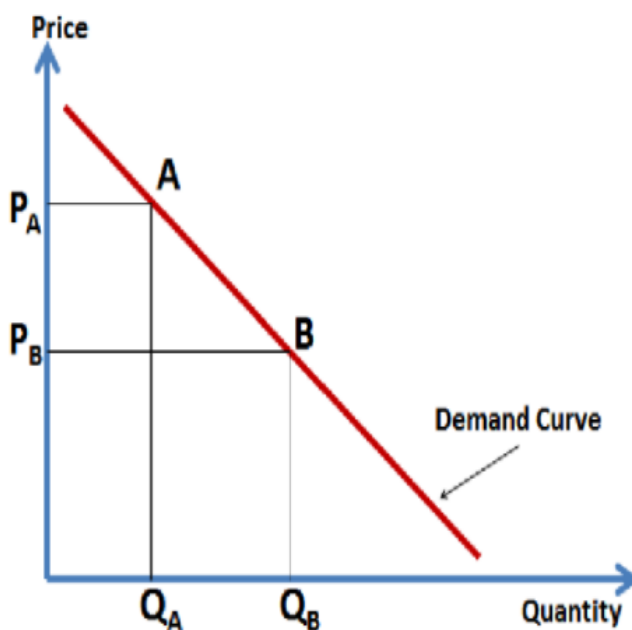
It relates the quantity purchased to price. It shows the quantities of a product that is demanded at different alternative prices. The demand schedule given below shows the quantities of commodity X that would be demanded at various prices.

Price of X	Quantity of X
5	175
10	150
15	125

20	100
25	75

Demand Curve

The demand curve is the graphical representation of the demand schedule. It slopes downward from left to right showing that price of a product and its quantity demanded is inversely related. It is seen that at a price of OP_A the demand is OQ_A and when price decreases to OP_B the quantity demanded increases to OQ_B .



Law of Demand

The law expresses the functional relationship between the price and quantity demanded of a commodity. It states that more of a commodity will be purchased at a lower price and less of it at a higher price, other things remaining the same. 'Other thing remaining the same' is known as *ceteris paribus* and refers to the following assumptions.

Assumptions of the Law

1. The income of the consumer remains constant.
2. There is no change in the consumers taste and preferences.
3. The prices of related goods remain unchanged.
4. The commodity does not have any close substitutes.
5. Consumer does not expect future price increases.
6. The commodity does not have a prestige value.

Exceptions of the Law

There are certain rare instances where the law of demand will not hold good.

1. Giffen Paradox: Robert Giffen discovered that poor people will purchase more of certain goods if their prices increase. Such goods are called inferior goods. Inferior goods are those goods which people buy in large quantities when they are poor and in small quantities when they become rich.
2. Veblen Effect: Thorstein Veblen has pointed out that some goods are demanded because of their high price. Such commodities are purchased not because of their usefulness, but because they confer a status or prestige to the buyer. If the price of diamonds were to become very cheap, the rich would stop purchasing it.
3. Speculation: If the price of a commodity is increasing and people expect it to go up still further, they may buy more of the product at higher prices in order to beat the price rise.
4. Bandwagon effect: In some instances, purchase of a commodity is influenced by the social class of the consumers. A person buys a new product because everyone in his social group has purchased one.
5. When people link the higher price of products to their better quality, they may buy the more expensive ones even when cheaper ones are available.

Individual demand & Market demand

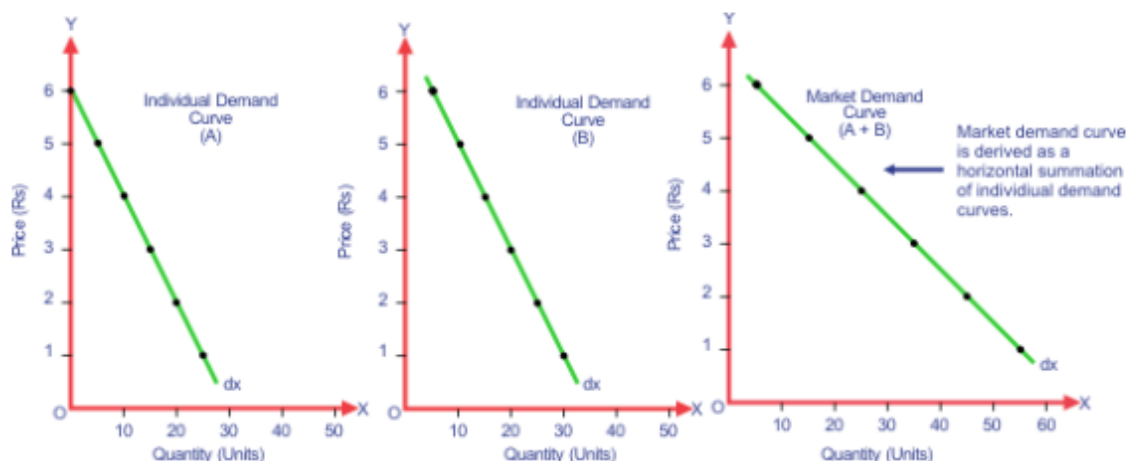
Individual demand refers to the quantity of a commodity that a consumer will purchase at various prices. It shows the individual preferences of the consumer.

Price of X	Quantity of X
5	6
10	5
15	4
20	3
25	2

Market demand is the sum total of the demands of all the individuals in the market. It is obtained by adding together the quantities demanded by all individuals at various prices.

Prices of pen (Rs.)	Quantity demanded by A (units)	Quantity demanded by B (units)	Market Demand (units)
6	0	5	5
5	5	10	15
4	10	15	25
3	15	20	35
2	20	25	45
1	25	30	55

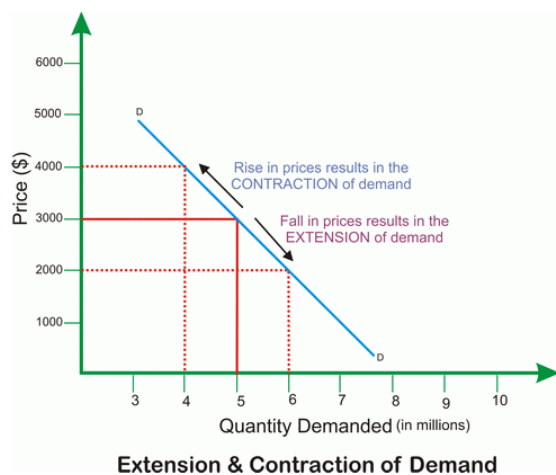
Table 3.1



Assume there are only two consumers in the market. Here at a price of Rs.3, consumer A purchases 15 units of the product while B purchases 20 units. The total demand of the product in the market is for 35 units as shown by the market demand curve.

Extension and Contraction of Demand (Movement along the demand curve)

If a change in the demand of a commodity is solely due to a change in its price, demand is said to extend or contract. It is represented by movements along the demand curve.

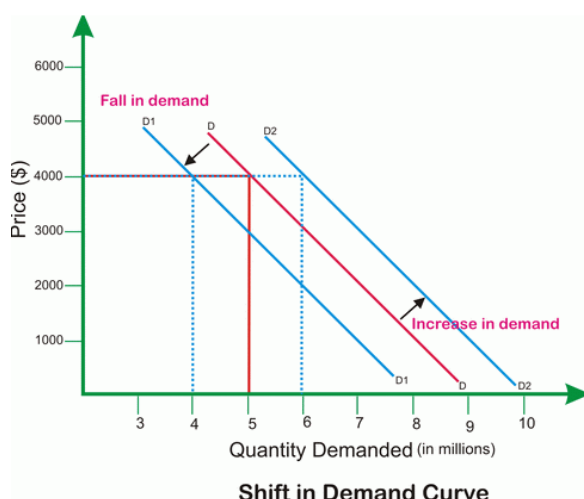


When the price of the good is \$3000, demand is for 5 million units. When the price falls to \$2000, demand expands to 6 million. Here the extension in demand is by 1 million.

When the price of the good rises to \$4000, the quantity demanded contracts to 4 million and the contraction in demand is by 1million.

Increase and decrease in demand (shifts in demand)

In this case factors other than price influence the demand curve. Changes in income, tastes etc. will cause demand to increase or decrease. Here the demand curve will shift. In the figure, increase in demand is shown by a shift of the demand curve to the right from DD to D₂D₂. The decrease in price causes the curve to shift to the left from DD to D₁D₁.



1.9 Elasticity of Demand

The term elasticity expresses the degree of correlation between demand and the factors influencing it. The law of demand explains that demand will change due to a change in the price of the commodity. However, it does not explain the magnitude and rate at which demand changes. The concept of elasticity of demand measures the rate of change in demand. This concept was introduced by Prof. Alfred Marshall.

Types of elasticity of demand

There are three types of elasticity of demand. (a) Price elasticity (b) Income elasticity and (c) Cross elasticity

(A) Price Elasticity

It is the degree of responsiveness in quantity demanded due to a change in price. It is the ratio of the percentage change in quantity demanded to the percentage change in price.

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

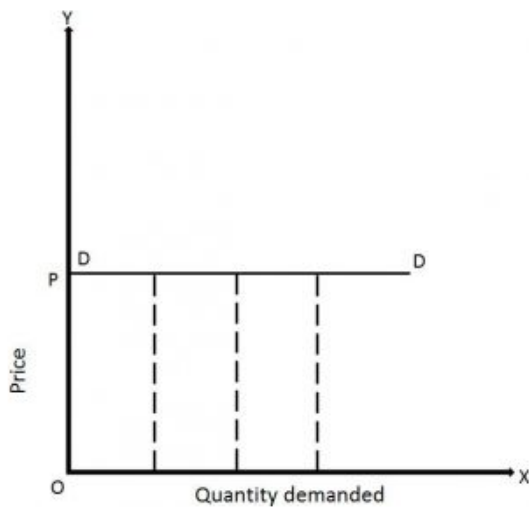
$$e_p = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}}$$

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

Types of Price Elasticity

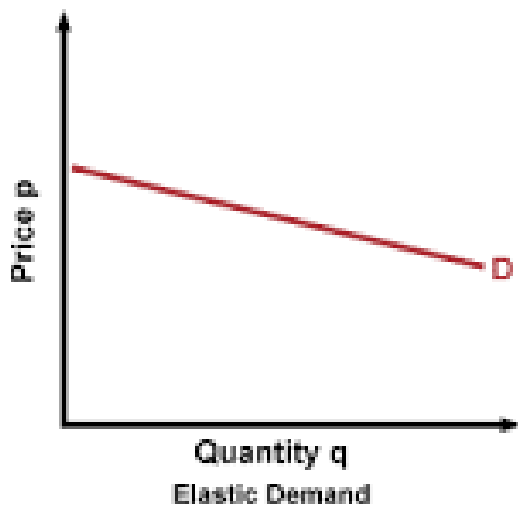
1. Perfectly Elastic

Here even very small changes in price causes an infinite change in quantity demanded. Such commodities have perfectly elastic demand and their demand curve will be a horizontal line. In such cases, the value of $e_p = \infty$.



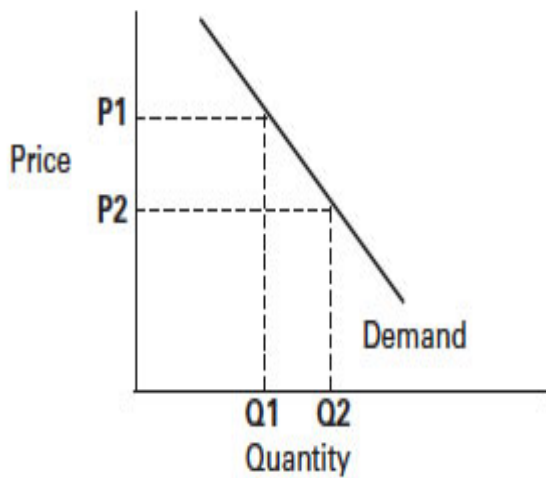
2. Relatively Elastic

Here the percentage change in quantity demanded of a commodity is more than the percentage change in its price. In such cases the value of $e_p > 1$. e.g. luxuries



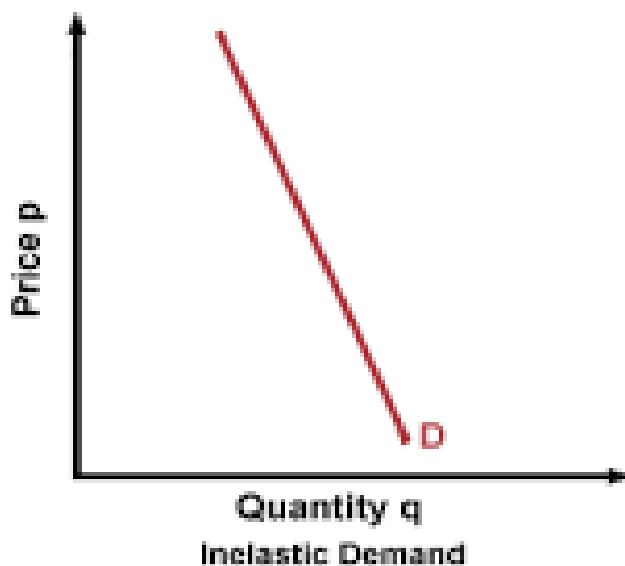
3. Unit Elasticity

Here the rate of change in demand is exactly equal to the rate of change in price. The demand curve for such products will be a rectangular hyperbola. In such cases, the value of $e_p = 1$



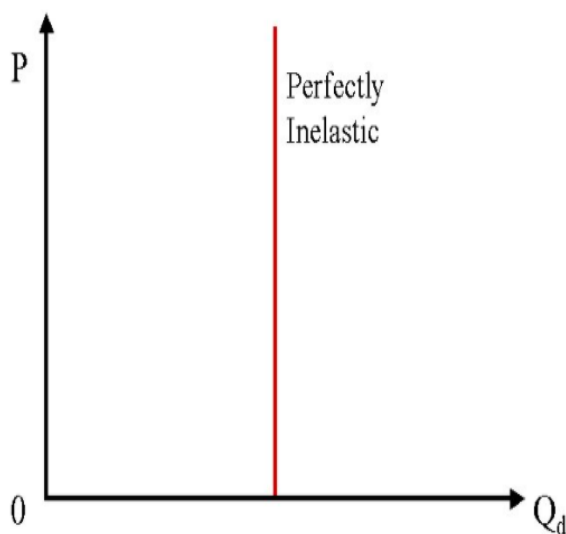
4. Relatively inelastic

In this type of commodities, the proportionate change in quantity demanded is less than the proportionate change in its price. In such cases the value of $e_p < 1$. e.g., necessities



5. Perfectly inelastic

Here even very large changes in price does not cause any change in quantity demanded. Such commodities have perfectly inelastic demand and their demand curve will be a vertical line. In such cases, the value of $e_p = 0$. e.g., salt, matchbox, rare paintings.



1.10 Measurement of Elasticity

There are four methods for measuring price elasticity

1. Percentage Method

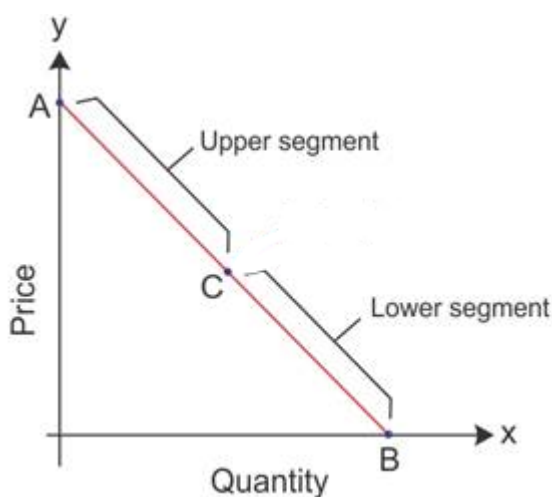
It is the ratio of the percentage change in quantity demanded to the percentage change in price.

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

2. Point Method

This method is used to calculate the price elasticity at any point on a linear demand curve.

$$e_p = \frac{\text{Lower Segment}}{\text{Upper Segment}}$$



Elasticity at point C is given by

$$e_p = \frac{BC}{CA}$$

Upon using this method it can be seen that at any point on the lower segment $e_p < 1$ and at any point on the upper segment $e_p > 1$.

3. Total Outlay Method

According to this method the change in total outlay or expenditure of the purchaser before and after the variations in price is estimated.

e_p is greater than unity, when, with the fall in price the total amount spent by the consumer on the commodity increases. On the other hand, if price rises, the total amount spent will decrease.

e_p is less than unity, when, with the fall in price the total amount spent by the consumer on the commodity decreases.

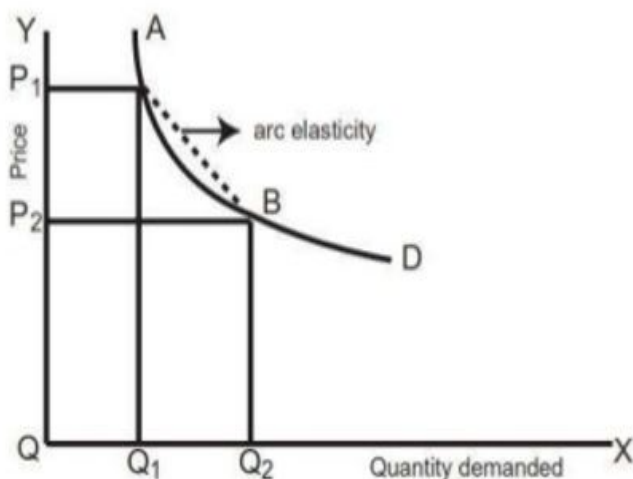
Price	Quantity Demanded	Total Outlay
5	60	300
6	50	300
7	40	280
8	30	240

In the above instance, elasticity serves as a warning signal to the businessman. He increases the price hoping to increase his revenue but due to the inelastic demand for his product, he suffers a decline in his revenue.

4. Arc Method

The demand curves are seldom continuous as there are big gaps in price and quantity. Hence the points on the demand curve are quite apart and elasticity is measured along an arc of the demand curve.

Here within the entire demand curve, two points A and B are considered. Upon joining them an arc is obtained and on average, the elasticity is measured.



$$e_p = \frac{\text{Change in quantity}}{\text{Average Quantity}} \div \frac{\text{Change in Price}}{\text{Average Price}}$$

$$e_p = \frac{Q_1 - Q_2}{(Q_1 + Q_2)/2} \div \frac{P_1 - P_2}{(P_1 + P_2)/2}$$

$$e_p = \frac{\Delta Q}{Q_1 + Q_2} \div \frac{\Delta P}{P_1 + P_2}$$

(B) Income Elasticity

It is the degree of responsiveness of demand to the change in income.

$$e_y = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in income}}$$

$$e_y = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta Y}{Y}}$$

For luxuries, $e_y > 1$

For necessities, $e_y < 1$

For inferior goods, income elasticity is negative. The consumption of inferior goods decrease with a rise in income for they are replaced by the superior substitutes at higher levels of income.

(C) Cross Elasticity

It is the degree of responsiveness of demand to the change in the price of related commodities. The relationship between two commodities x and y may be substitutive or complementary.

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

$$e_c = \frac{\frac{\Delta Q_x}{Q_x}}{\frac{\Delta P_y}{P_y}}$$

If two commodities are substitutes, e_c will be positive.

If they are complementary, e_c will be negative.

If the commodities are unrelated, e_c will be zero.

Applications of Elasticity of Demand

1. Taxation: The finance minister will tax those commodities with inelastic demand to ensure a stable revenue. As a result of the tax, even when price increases people will continue to purchase the commodity.
2. Determination of employee salary: Salaries are likely to be high in places where the demand for workers is inelastic.
3. International Trade: If the demand for a country's exports is elastic, its trade will always be under pressure and the terms of trade may turn unfavorable.
4. Poverty in Plenty: The concept of elasticity explains the paradox of poverty in the midst of plenty since demand is inelastic for perishable agricultural products. A rich harvest may actually fetch less money to the farmer.
5. Monopoly price: A monopolist often has an inelastic demand for his product and is able to charge a high price.

1.11 Supply

Supply refers to the quantity of a product that will be offered for sale at a particular price at a certain time. The main factor influencing supply is price.

Determinants of supply

1. Production Costs: If the cost of production increases due to an increase in the price of raw materials, supply will decrease.
2. Production Technology: Improvements in technology lowers the cost of production and increases supply.
3. Number of producers of the product.
4. Improvement in transport facilities

5. Mass Production: If products are mass produced in factories, production costs will be lower and more will be supplied into the markets as companies try to sell all of the output.
6. Taxation: A higher rate of taxes on output will result in less being produced by the manufactures.
7. Other Factors: Many factors like political instability, war, climatic factors and natural calamities reduce supply.
8. International Trade: If a country encourages trade more of various products are likely to be available.

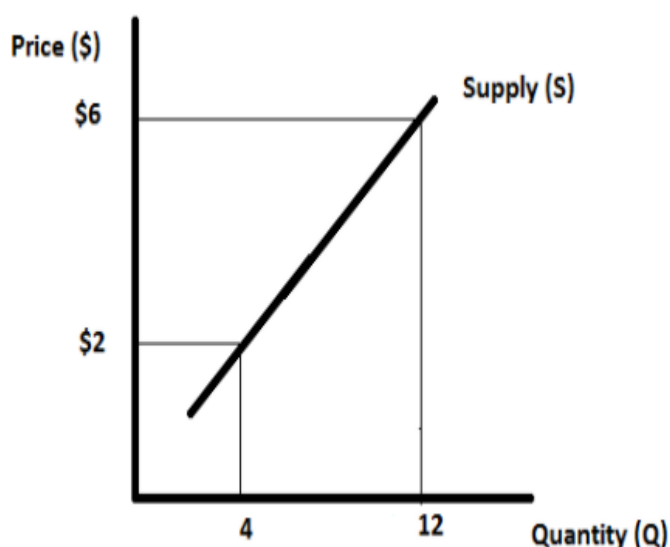
Supply schedule

The supply schedule relates the quantity supplied of a commodity to its market price. It shows the various quantities of a commodity that will be offered for sale at different prices.

Price of X (\$)	Quantity of X (units)
1	2
2	4
4	8
5	10
6	12

Supply curve

The supply curve is the graphical representation of the supply schedule. It is positively sloped showing that the price of a product and its quantity supplied is directly related.



It is seen that at a price of \$2 the supply is 4 units and when price increases to \$6 the quantity supplied also increases to 12 units.

Law of Supply

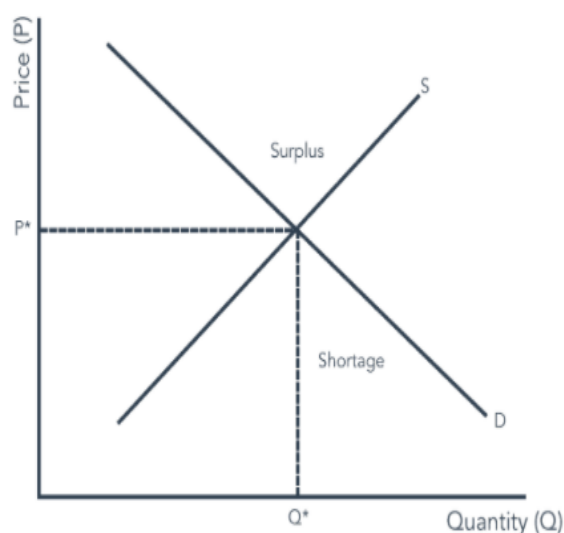
The law of supply states that less of a product will be supplied at a lower price and more of it at a higher price, other things remaining the same. It establishes a direct relationship between price and supply.

1.12 Equilibrium (Determination of equilibrium price in the market)

Consumers purchase a product because it gives them utility and will try to buy it at the lowest possible price. Manufacturers sell a product to maximize their profit and will try to sell at the highest possible price. Thus, the two opposing forces of demand and supply interact to bring about an equilibrium price.

The market equilibrium comes at that price and quantity where the forces of demand and supply are in balance. At the equilibrium price, the amount that buyers want to buy is exactly equal to the amount that sellers want to sell and there is no tendency for the price to rise or fall. The equilibrium price is also called the market clearing price.

Price (Rs)	Demand (units)	Supply (units)	Market Status
30	100	300	Surplus
20	200	200	Equilibrium
10	300	100	Shortage



The market is in equilibrium at the point at which the demand and supply curves intersect. Suppose price is increased to Rs.30. At this price there is a surplus of the product

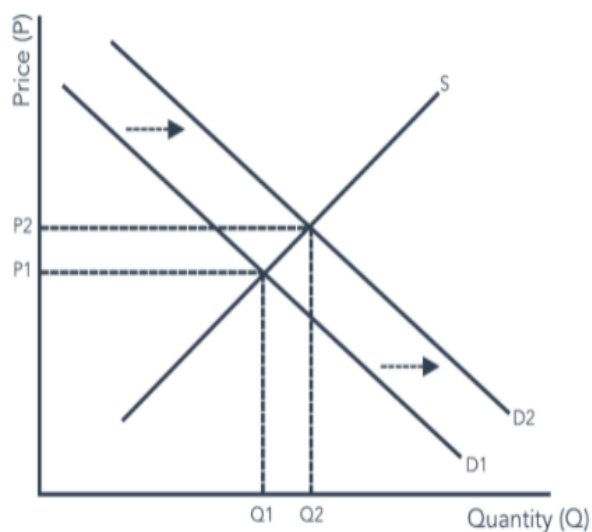
and price has the tendency to fall. If price is decreased to Rs.10, there is a shortage of the product and price has the tendency to rise. The market is in equilibrium at a price of Rs.20 when quantity supplied becomes equal to quantity demanded. Neither the seller nor the buyer has any tendency to change the price.

1.13 Changes in demand and supply and its effects

1. Rise in Demand

A rise in demand will cause the demand curve to shift upwards and to the right resulting in higher prices. It may occur due to:

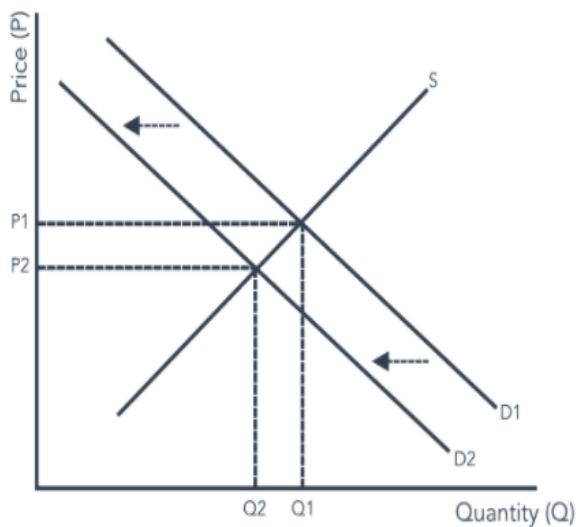
1. Increase in the price of substitutes.
2. Decrease in the price of complementary goods.
3. Increase in the level of income.
4. Changes in taste and preferences in favour of the product.
5. Expectation of future scarcity.



2. Fall in Demand

A fall in demand will cause the demand curve to shift downwards and to the left resulting in lower prices. It may occur due to:

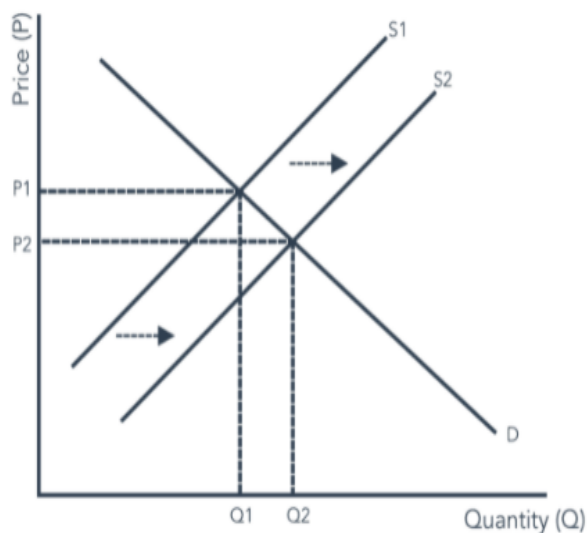
1. Decrease in the price of substitutes.
2. Increase in the price of complementary goods
3. Decrease in the level of income
4. Changes in taste and preferences against the product.
5. Expectation of future surpluses.



3. Rise in Supply

A rise in supply will cause the demand curve to shift downwards and to the right resulting in lower prices. It may occur due to:

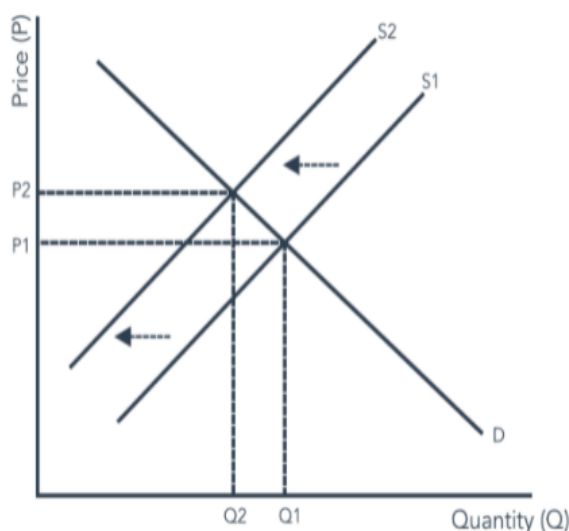
1. Decrease in the price of related goods.
2. Decrease in the cost of production.
3. Increase in the level of technology and skill.
4. Favourable unplanned factors like good weather conditions.



4. Fall in Supply

A fall in supply will cause the demand curve to shift upwards and to the left resulting in higher prices. It may occur due to:

1. Increase in the price of related goods.
2. Increase in the cost of production.
3. Unfavourable unplanned factors like bad weather conditions.

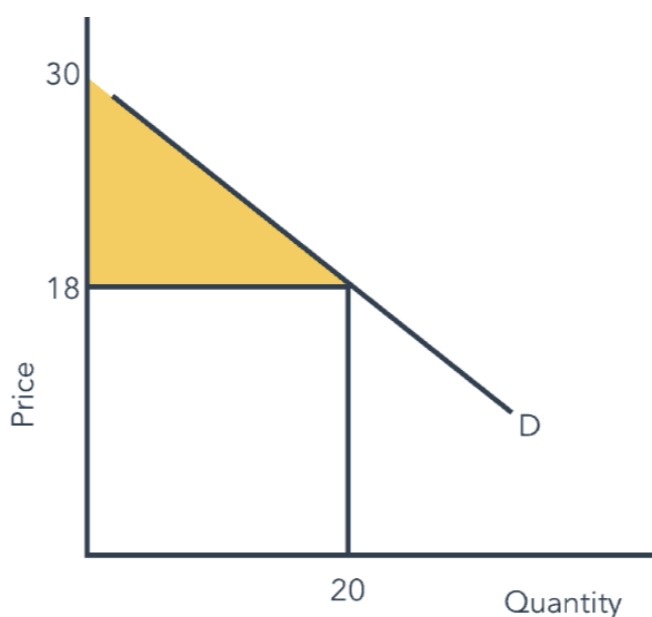


1.14 Consumer surplus

Consumer surplus is the amount a buyer is willing to pay for a good minus the amount the buyer actually pays for it. It is the gap between the utility of a good and its market value. The surplus arises because the consumer receives more value than he pays for.

Consumer surplus can be measured using the demand curve. The demand curve measures the price buyers are willing to pay for the good. The difference between this willingness and the market price is each buyer's consumer surplus. The total area below the demand curve and above the price measures the consumer surplus of all buyers in the market.

In the example, the price of the good is Rs.18. All the buyers who were willing to buy at prices above Rs. 18 are better off because they now pay only Rs.18 for the good. The total consumer surplus is given by the shaded area.

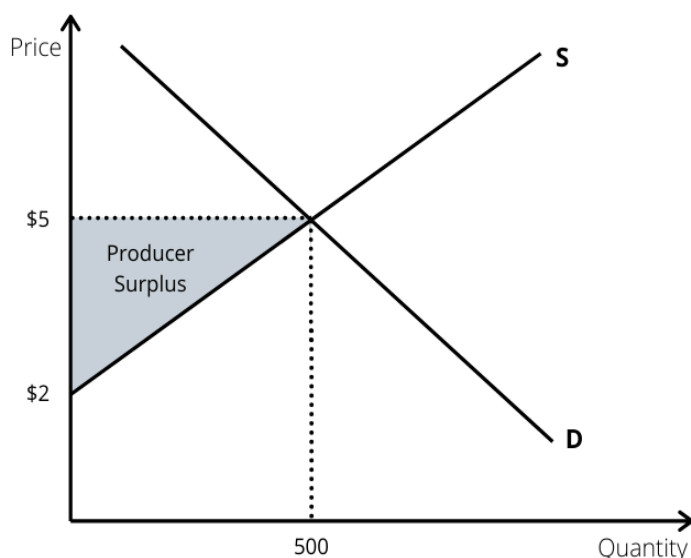


Applications of Consumer Surplus

1. The concept of consumer surplus is useful in evaluating many government projects. A toll-free road or a bridge should be built if its consumer surplus is more than its costs.
2. This concept points to the enormous privileges enjoyed by citizens in modern times. Each person enjoys a wide variety of enormously valuable goods that are purchased at very low prices.
3. It is a measure of the economic wellbeing of a society. A larger consumer surplus provides buyers with immense benefits.
4. It is used in evaluating the loss to the consumer from taxes.
5. It is used to evaluate the gain from subsidies.

1.15 Producer surplus

Producer surplus is the amount a producer is paid for a good minus the producer cost. It measures the benefit that sellers of a product receive. It is the area above the supply curve but under the price line. Here the price of the good is \$5 while producers are willing to supply it from \$2 onwards. The total producer surplus is shown by the shaded area.



1.16 Taxation

A tax is a compulsory contribution imposed upon persons to meet the expenses of the government. All countries impose different types of taxes to generate revenue. In most poor countries, taxes are the major source of income for the government. The money thus collected is utilized for running the government and for developmental activities.

In the words of Prof. Dalton, a tax is a compulsory contribution imposed by the public authority, irrespective of the service rendered to the taxpayer, in return for which no specific and direct *quid pro quo* is rendered to the payer.

The State has the right to tax. Refusal to pay the tax is punishable. The phrase 'without *quid pro quo*' means the absence of any direct and proportional benefit to the taxpayer from the government.

Direct and Indirect taxes

Taxes can broadly be classified into

- a. Direct taxes
- b. Indirect taxes

Direct taxes

A direct tax is one whose burden is borne by the person on whom it is levied. The relation between the tax-payer and the revenue authorities is direct and personal. The burden of the tax cannot be transferred to some other person. In such a tax the impact and incidence of the tax is on the same person.

Impact of taxation refers to the immediate burden of the tax. It refers to the person who has to pay the tax to the authorities. Impact is on the person who is responsible for the payment of the tax.

Incidence of taxation refers to the ultimate burden of the tax. It refers to the person on whom the burden of the tax ultimately falls. It is the final resting place of the tax burden.

In the case of a direct tax like income tax the impact and incidence of the tax is on the same person. He cannot transfer the tax to some other person.

E.g. Income tax, wealth tax, gift tax, property tax

Advantages

1. They are economical since the cost of collection is low.
2. They are progressive in nature.
3. They are equitable due to the presence of exemption limit.
4. They are certain. The money burden of the tax is known in advance.
5. Direct taxes create civic consciousness. The tax payer feels that he is contributing towards the State expenditure. He tries to ensure that money is not wasted by the government.

Indirect taxes

Here the tax is levied on one individual but the burden falls on another. The tax depends on the value of the particular commodity purchased. There is an indirect relation between the tax-payer and the revenue authorities since the taxes are collected unofficially through the merchants.

In the case of indirect taxes, the impact and incidence are on different persons. For example, the excise duty on cement is paid by the producers but ultimately, they transfer it to the consumer by increasing the price of the product by an amount equal to the tax.

E.g. value added tax, customs duty, service tax etc.

Advantages

1. Indirect taxes are convenient.
2. Tax evasion is not possible.
3. They are socially desirable since harmful products can be taxed at high rates.
4. Taxation of certain commodities will discourage their production. In this way resources used for the production of luxuries can be diverted to the production of necessities.
5. Income from them goes on increasing with increase in industrial output.

1.17 Principles of taxation (Canons of Taxation)

Canons of taxation refer to principles laid down as a direction to the tax authorities. Governments should ensure that their taxes follow the canons.

1. Canon of Equity. Every person will pay taxes according to his ability to pay. It lays the moral foundation of the tax system. There should be equality in the sacrifice of each person who pays the tax.
2. Canon of Certainty. The tax payer should know in advance how much tax he has to pay. The time and manner of payment must also be known. The tax payer should be able to see why he has to pay a particular amount. The government should also be sure of the amount that will be collected as tax so that it can follow its financial programme.
3. Canon of Convenience. Since the tax payer makes a sacrifice at the time of payment, the mode of payment should be made as convenient as possible. Taxes on consumers are convenient. They are paid when purchases are made and consumers make no special arrangement for paying a tax. The price of the product includes the tax also.
4. Canon of Economy. Cost of tax collection should be kept to the minimum. Taxes should also not retard industrial development. If income taxes are high, savings are likely to suffer. Similarly, taxes on raw materials raise the price of the finished products and weaken the competitive power of companies.
5. Canon of Simplicity. Tax payer should understand the details of the tax without the assistance of experts.
6. Canon of diversity. A single tax will not be enough. There should be a wise mixture of direct and indirect taxes so that all persons who can afford to may contribute to the state revenue.
7. Canon of elasticity. The various taxes and their rates must be varied according to the level of income of the people and the requirements of the country.

1.18 Goods & Services Tax

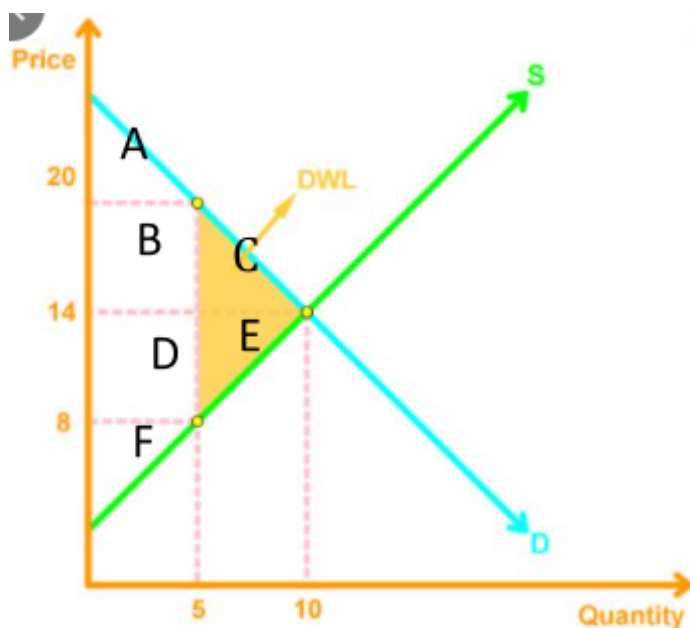
GST is one indirect tax for the whole nation which will make India one unified single market. It is the tax system that is now being followed by several countries around the world. It is an indirect tax reform which aims to remove tax barriers between states and create a single market. It is a tax only on the value added at each stage. This system of input tax credit in GST allows sellers to claim the tax already paid, which reduces the final burden on the end consumer.

Advantages

1. GST will result in the creation of a common national market.
2. By avoiding the cascading effect of taxes, GST will result in gains for the end consumer.
3. It will result in a reduction in multiplicity of taxes.
4. It will ensure that indirect tax rates are common across the country,
5. It will bring about transparency in the tax system.
6. To traders, it means a simpler tax regime and ease of payment since the payment can be done online.
7. It will improve the collection of taxes and boost the development of Indian economy by removing the indirect tax barriers between the different States in India.
8. By allowing input tax credit, it will reduce the burden of taxes, and this is expected to bring down prices.
9. GST is mainly technology driven, hence chances of malpractices are minimized.

1.19 Deadweight Loss

The fall in consumer and producer surplus that results due to a tax is the deadweight loss. When a new tax is introduced, the price paid by the buyers rises and the price received by sellers falls. There is a loss in the real income of both buyers and sellers. As the price of a good increases due to the introduction of a new tax, buyers reduce their purchases and the sellers are able to sell less of the good than before. Thus, the size of the market shrinks.



In the figure, initially at the equilibrium point, price is Rs.14 and quantity is 10 units. The consumer surplus is shown by A+B+C while producer surplus is D+E+F. A new tax of Rs. 6 is introduced on the buyers and sellers. The effective price of the good is now Rs. 20. Due to the increase in price, the seller is able to sell only 5 units. The effective price received by the seller is now only Rs. 8 since he has to pay a tax of Rs.6. The tax reduces consumer surplus by the area B+C and producer surplus by the area D+E. The tax revenue of the government is given by B+D. Since the fall in producer and consumer surplus exceeds tax revenue, the tax is said to impose a deadweight loss, given by the area C+E.

Problems:-

1. Suppose hotels and homes have the following demand for ornamental lights.

Price	No. Of units purchased by hotels	No. Of units purchased by homes
150	2100	1000
200	2000	800
250	1900	600
300	1800	400

- As the price of tickets rises from 200 to 250, what is the price elasticity of demand for (i) hotels and (ii) homes?
- Why might hotels have a different elasticity than homes?

2. A company had spent Rs. 3 crores on advertisement in the previous year and its sales of mobiles were 150 lakh units in that year. In this year, it increased its outlay on advertisement to 4 crores and sales jumped to 280 lakh units. Calculate the advertising elasticity of the company. Is it profitable for the company to spend more on advertising?
3. When the price of product Y was reduced from Rs.10 to Rs.9, the quantity demanded of X fell from 1000 units to 800 units. Calculate the cross elasticity of demand for X. Are the two products substitutes or complements?
4. The supply equation for selling a product is as follows: $Q = -5 + 2P$. How many units can be sold if the price is Rs.4 per unit? At what price will the manufacturer be no longer willing to sell any unit?
5. The price of a matchbox was Rs. 3 a box, and Mr. X brought 10 boxes. Later, the price went up to 3.75 a box, and he is now willing to buy 8 boxes. Is his demand for matchboxes elastic or inelastic?
6. When the income of a consumer was Rs. 5000 per month, the quantity demanded of a commodity was 25 kgs. When his income increased to 5500, his demand increased to 30 kgs. Calculate the income elasticity of demand.
7. If a consumer's elasticity of demand for coffee is constantly (-) 0.9, and he buys 4 cups when the price is \$1.50 per cup, how many will he buy when the price is \$1.00 per cup?
8. A shopkeeper decides to sell eggs for \$4 a dozen. He sells 50 dozen, and decides that he can charge more. He raises the price to \$6 a dozen and sells 40 dozen. What is the elasticity of demand? Assuming that the elasticity of demand is constant, how many would he sell if the price were \$10 a dozen?
9. Which of the following goods are likely to have elastic demand, and which are likely to have inelastic demand?
 • Cooking oil • Pepsi • Chocolate • Water • Medicine • Wall Painting
 • Text book • Diesel • ultra slim laptops
10. An individual spends all his income for two goods X and Y. If with the rise in the price of good X, quantity demanded of good Y remains unchanged, what is price elasticity of demand for X?
11. Why would a government tax on cigarettes be an ineffective method to decrease consumption of cigarettes?
12. A shop charges \$10 per kilo for chocolates. The elasticity of demand for chocolate in the town is 2.5. If the shop wants to increase its total revenue, what advice will you give and why?
13. A 10 percent increase in income brings about a 15 percent decrease in the demand for a good. Is the good a normal good or an inferior good? Explain your answer.
14. If the cross elasticity of demand between products X and Y is -1.4, then are the two commodities substitutes or complements? Explain your answer.

