

Chapter 2

CONSUMER BEHAVIOUR

Never ask of money spent
Where the spender think it went
Nobody was ever meant
To remember or invent
What he did with every cent.

Robert Frost

Broadly speaking, there are two basic economic activities; **production** of goods or services and **consumption** of goods or services. In a way, consumption is more basic and important. Consumption is the ultimate objective of all economic activity. People work and produce something only to obtain goods and services for consumption. Personal consumption expenditures form the largest part of national product. (For example in Pakistan, people spend more than 86% of their incomes on consumer items and save less than 14%). Every society tries to produce only those goods which people want to consume.¹ **Consumption means the use of goods or services for direct satisfaction.**

Consumer Behaviour

The behaviour of the people with regard to selection, purchase and consumption of goods and services for satisfaction of their wants is known as **consumer behaviour**.

According to modern economics, there are definite principles which a consumer consciously or unconsciously follows.² He does not roam about the market and buy whatever is available there at any price. Rather before every purchase, he takes many things into consideration. *First of all* he makes an idea of what commodities he would like to consume. For this purpose, he compares the satisfaction or utility he expects from each commodity. He would do so in the light of his tastes. Since he knows that he cannot get everything he desires, he puts the desired commodities in order of preference. *Secondly*, he makes an estimate of the available money, which he can spend. It is a universal truth that money can never be enough to buy everything one wants. **Scarcity compels choices**. Finally, the consumer takes into consideration market prices of goods. When he realizes that the available money cannot get all he wants, he shortens the list by selecting only those goods that promise greater utility. Then he proceeds to buy commodities in quantities he can afford. Every consumer tries to attain a higher and higher level of satisfaction. **The desire to increase satisfaction to the maximum is called the rationale behind consumer's behaviour.**

We can prove that to achieve his aim of maximum utility, the consumer must distribute the available money according to the principle of equi-marginal. The principle explains that total utility of a given amount is maximum only when the marginal utility of money from all commodities is equal.

¹ The motivations and behaviour of consumers are of interest not only to economists, but also to sociologists, psychologists, advertisers and just about everyone who owns or manages a business. Theories of consumer demand help to produce reliable forecasts of consumer behaviour.

² **Households:** Because most of the decisions about consumption of goods are joint in the family, we may use the term household in place of the word consumer. Household in economics means a consuming unit. It may consist of an individual or a group of several members of the family.

4/10 Important UTILITY G.T

Goods are demanded because they have utility. We can define it as:
'Utility is the satisfaction that a person gets from consumption of a good or service.'³ (See characteristics of utility in the previous chapter.)

MARGINAL UTILITY, TOTAL UTILITY AND THEIR RELATION

Utility is the satisfaction derived from use of a good or service. People buy ice cream because it has utility. But the question arises why they stop buying at some point. Even those who love ice cream and can afford to buy more don't eat endlessly. To answer this question we have to learn about the concept of total and *marginal* utility.

Total utility is the total amount of satisfaction a person derives from consuming some good.

Marginal utility is the change in total utility due to consumption of one more unit of a good.⁴ It is the utility of the last unit consumed. For example according to table 2.1 if the consumer eats only 4 apples, marginal utility is 2. It is zero when he eats 5 apples.

Zero utility (point of satiation) Zero utility means the consumer has no further desire for the commodity. In the table when he eats 5 apples, utility is zero i.e. he has no desire for another apple⁵.

Total utility and marginal utilities of a commodity have a definite relation to each other.

- (1) Marginal utility is found from total utility.
- (2) Marginal utility is the rate of change of total utility.
- (3) If total utility is increasing it means that marginal utility is positive. In the given table, up to 4th apple total utility increases so marginal utility is positive

Apples	Total Utility (TU)	Marginal Utility (MU)
0	0	-
1	8	8 (= 8-0)
2	14	6 (= 14-8)
3	18	4
4	20	2
5	20	0
6	18	-2

- (4) When total utility is maximum, marginal utility is zero, which means that by consuming an extra unit no change occurs in TU. This is the stage when 5 apples are consumed.
- (5) When total utility decreases, marginal utility is negative. At 6th apple, total utility starts diminishing, therefore marginal utility is negative.
- (6) Marginal utility of n units = Total utility of n units - total utility of (n - 1) units.

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

In the above table, if we assume n = 4, then marginal utility of 4 apples is equal to total utility of 4 apples minus total utility of 3 apples.

$$\text{TU of 4 apples} = 20$$

$$\text{TU of 3 apples} = 18 \quad (MU_4 = TU_4 - TU_3)$$

³ Utility is also termed as 'value in use'

⁴ MU is the addition to total satisfaction from an extra unit or $MU = \Delta TU / \text{Change in quantity}$.

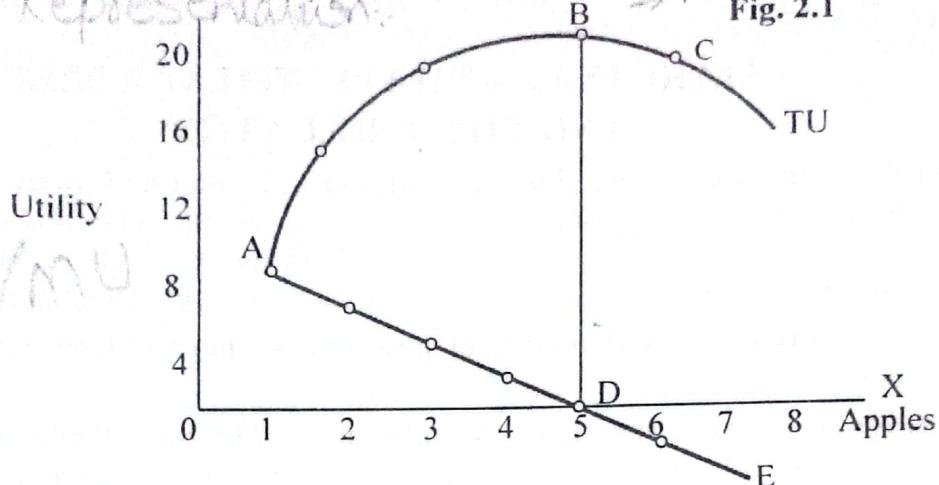
⁵ Negative utility means dissatisfaction or displeasure.

MU of 4 apples = $20 - 18 = 2$

Total and marginal utilities can be shown graphically. The relation of total utility and marginal utility becomes clear if we look at figure 2.1 (or figure 2.2).

Graphical Representation:

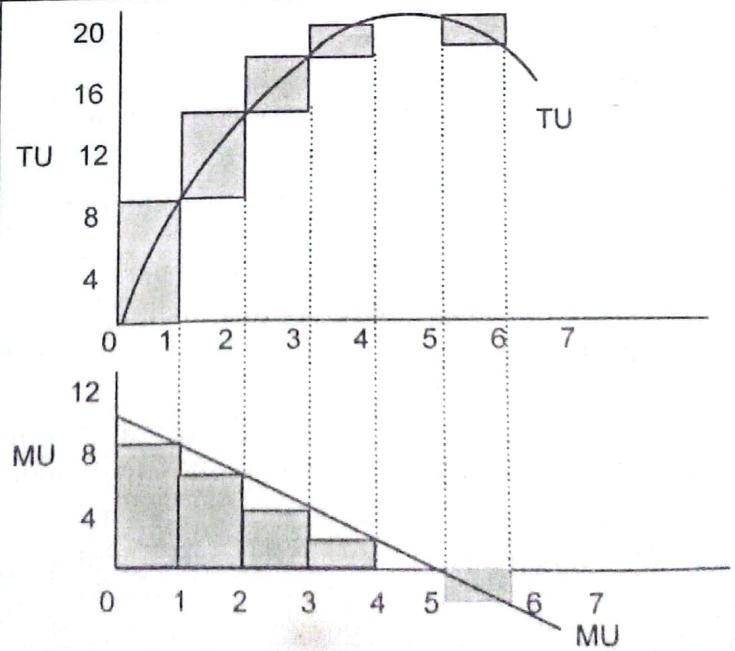
Fig. 2.1



Apples are measured along x-axis and utility along y-axis. The curve ABC shows total utility while curve AE shows marginal utility. Starting from point A, when the consumer eats more apples, total utility curve rises. Marginal utility in this stage is positive but decreasing. So MU curve is falling. At point B total utility reaches the maximum height, which means marginal utility is zero (point D). After reaching the highest level, if the consumer still continues eating apples, total utility starts falling. Decrease in total utility means negative marginal utility – shown by line from point D to E. (Rise of total utility curve at first and then fall is a universal pattern true for every economic good and every consumer even though people have different tastes. Similarly, falling marginal utility is a universal truth.)

Fig.2.2

The relation between TU and MU can be shown by making rectangles for utility of each unit.



S1Q

VALUE AND PRICE

Value and price are two different but closely related concepts.

VALUE

The word value is used in two meanings:

- (i) Value in use.
- (ii) Value in exchange.

Value in use means utility of a commodity. In common language, a more 'valuable' good is that which has more utility or is more useful. However,

In economics, value means 'value in exchange'.

'Value of a commodity is the amount of other goods and services, which is obtained in exchange for it'.

Example If we can get two chairs for one radio, then, the two chairs are the value of that radio. Similarly, if one pen is exchangeable for 3 notebooks, these notebooks are the value of the pen.

Value is a relative term. It changes with persons, places and time. One person may exchange a shirt for two ties while some other may demand three. Thus, the value of the shirt for the first person is two ties and for the second it is three ties. Similarly, a kilo of apples may be exchanged for two kilos of wheat in Swat but for four kilos in Islamabad.

Determinants of Value

Value of a commodity depends upon **three factors**.

- (i) **It must have utility** A good with greater utility will have higher exchange value.
- (ii) **It must be scarce** Free goods have no value e.g. air. The scarcer a good is, the higher will be its value in exchange. Gold is found in small quantity than iron. Therefore, value of gold is higher.
- (iii) **It must be transferable** from one person to another. Suppose a person is allotted a house by the government on the condition that he can live there but cannot sell it; and neither can give on rent. The house then has utility but no exchange value for that person. If a student is given a motor cycle on the condition that he can use it but can not sell, then since motor cycle is not transferable, it has utility but no exchange value.

PRICE

Value of a commodity expressed in terms of money is called its price.

In modern economic systems we rarely exchange goods directly against goods. We use money as medium of exchange. So we are interested to know the 'prices of goods' in money units and not value in the terms of goods. If a pair of shoes is exchangeable for Rs. 800, then this amount is the price of shoes. A doctor charges Rs. 1000 for consulting him. This fee is the price of his services.

Prices of goods are determined by the forces of demand and supply acting in the market. A higher demand for a commodity raises its price⁷. Market value of something is its market price⁸

Scarce
↓
Demand is
greater than
Supply

⁶ **Opportunity cost.** We can also say that value is measured in terms of opportunity cost. Opportunity cost means the best alternatives forgone in order to obtain something.

⁷ Sometimes, price may change without affecting value. For example, if prices of all goods double, then, the value of goods remains the same. It would simply mean that the value of money has fallen.

INCOME

Income is the amount or reward, which a person receives for his personal services or the services of his property. People receive incomes from various sources. They may get *rent* of their land or property. They may get *interest* on the money lent. They may earn *wages* by working themselves or may receive *profit* from some business. These are different forms of income. Income may be individual income or national income. National income is the sum of all individual incomes of the people of a country.

If a person sells a commodity then the whole amount received by him may not be income. Cost of production and expenditure on raw materials has to be deducted. Thus the income of a bus owner (from the bus only) is found by deducting the wages of driver and conductor, the fuel bill, the taxes and depreciation estimate of the bus. Similarly, if a person sells a chair for Rs. 1000, his income from chair is found by subtracting from this amount every cost paid by him for materials and hired labour.⁹

Income can be divided into two parts: earned income and unearned income.

Earned income or labour income is the money paid to people for the work they do e.g. salary of a driver and wages of a hairdresser

Unearned income is money gained from owning assets or wealth e.g. rent received for a building or interest received on deposits in a bank.

Income and Transfer Payments

Income is the payment, which is received for taking part in the production of goods and services. If a person receives some payment without providing any productive service; in economics, it is not called income but transfer payment. Zakat, alms, pension, gift and unemployment allowance are transfer payments. The person receiving Zakat is never asked to do some work against it, while a wage earner must do some work to deserve payment of wages.

National Income

The total annual income of all residents of a country is called national income. We know that income is generated only when goods and services are produced. The value of goods produced and total incomes of the persons who help in the production of these goods are always equal. So we can define in another way.

"National income is the total money value of all final goods and services produced in a country during one year".

⁸ **Role of Prices. (Price Mechanism).** In a free market economy (capitalism), it is the mechanism of prices, which runs, directs and guides the economy. The resources of the economy are allocated through prices e.g. if price of some product is rising, then resources like land, labour and capital will be attracted to that business. The buyers also decide the quantity to be purchased on the basis of prevailing prices. So **modern economies are actually price-economies**. Actions of producers, consumers, wage earners, businessmen etc. are affected by changes in prices.

⁹ **Money Income and Real Income:** Money income is also called nominal income. **Money income** is the amount received by a person by doing some labour or by providing services of land and capital. **Real income** is the quantity of goods and services purchasable by spending money income. When general price level rises while money incomes remain constant, real incomes fall. **Living standard** of the people depends upon real income; not on money income. Real incomes change inversely with changes in general price level.

WEALTH

Wealth means all those things, which are used by the people and are not free.

In ordinary language, wealth means money, gold, silver or jewellery. But in economics wealth has a broader meaning. Wealth includes all things such as houses, land, cattle, machinery, gold, money, clothes, furniture, books, and shares of companies.¹⁰

Characteristics

Anything counted as wealth has three essential characteristics.

- Utility** Utility means the power of a good to satisfy a human want. People try to get various goods only because they have utility. A stray dog in a street is not wealth, but a watchdog in a house is wealth since it has utility.
- Scarcity** Scarcity means that a good is not available in unlimited quantities. If a good is not free, it is called scarce. For example, air is found in unlimited quantity and is a free good. So it is not wealth.
- Transferability** Only those goods are included in wealth which can be transferred from one person to another or can be exchanged for some other good.

(In nutshell, anything, which has value, is wealth.)

Kinds

Wealth is of four kinds.

- Individual Wealth**/Private Wealth. This includes all material things which a person possesses e.g. land, house, jewellery, cattle, watch, books etc.
- Public Wealth** or Social Wealth These are the assets created for the benefit of the general public and are the common property of the whole society. e.g. government buildings, roads, railways, public parks etc.
- National Wealth** natural resources of a country e.g. rivers, forests, minerals plus all public and private wealth like houses, machinery and roads is called national wealth.
Private wealth + Social wealth = National wealth
- International Wealth** includes all such goods or natural resources which jointly belong to all mankind and can be used by all countries e.g. air, oceans, higher space.¹¹

LAW OF DIMINISHING MARGINAL UTILITY

Law of diminishing marginal utility is a fundamental law of economics. Many economic theories are based on it. *Marginal utility represents the increase in total utility when one more unit is consumed.* It is our common experience that when a person has strong desire for a good, its use gives him a lot of satisfaction. In economics, we say that the good has great utility for him. But as the quantity consumed of the good is increased, it becomes less attractive. Every new unit of it has less utility. This universal fact about utility is known as law of diminishing marginal utility. We can define:

"If other things do not change and a consumer increases the use of a commodity, the utility of every new unit of the commodity will be less than the utility of the previous unit".

¹⁰ A commodity, which is wealth at one place, may not be considered so at some other place.

¹¹ Some countries are trying to establish colonies on moon. We can say that moon is international wealth.

Second Statement:

OR
"Other things being equal, a successive increase in the stock of a commodity with a consumer diminishes (decreases) its marginal utility".

Other things being equal means that the quality of the commodity and taste of the consumer do not change.

Explanation:

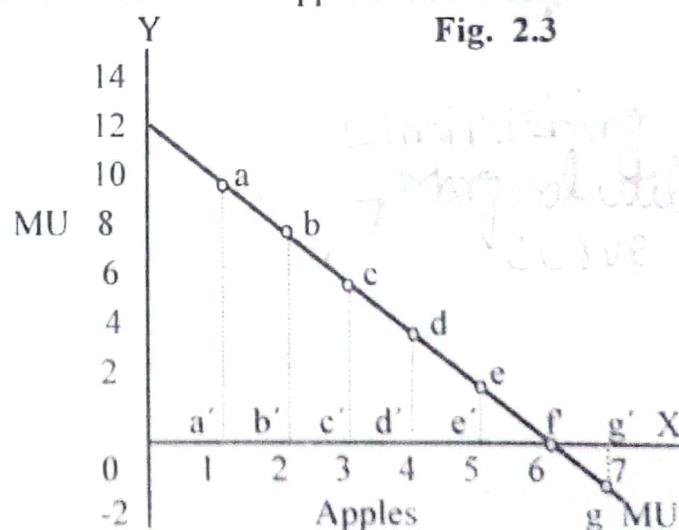
Law of diminishing marginal utility can be explained with the help of a simple example. Utility is not directly measurable but for the purpose of illustration we assume that we can measure it. (Sometimes economists use imaginary units called 'utils' for this purpose). Suppose a person starts eating apples. He gets utility as follows:

Table 2.2

Number of Apples	Marginal Utility (MU) (units)	Total utility (TU)
1	10	10
2	8	18
3	6	24
4	4	28
5	2	30
6	0	30
7	-2	28

We see that the first apple gives the consumer 10 units of utility. When he gets two apples, total utility goes to 18. Thus, second apple has increased total utility by 8 ($18 - 10 = 8$). This is marginal utility. Similarly, when the consumer eats third apple, marginal utility is 6. As the consumer goes on eating more and more apples marginal utility goes on decreasing (and TU grows at a slower and slower rate). It may fall to zero or even become negative. In the above table, 7th apple has negative utility i.e. dis-utility (e.g. upsetting of stomach). The consumer would not like to eat 7th apple even if free.

Fig. 2.3



Law of diminishing marginal utility can also be explained in a graphical form.

Apples are measured along x-axis and marginal utility along y-axis. First apple gives 10 utility. This is shown by the line aa'.

Similarly, utility of other apples is shown by line bb', cc', dd', ee', ff' and gg'. Utility of each new apple decreases so the lines get shorter and shorter. When we joint the end points of lines, we get marginal utility curve. It is downward sloping.

Assumptions

The law of diminishing marginal utility is true only with the following assumptions:

1. **Nature of the commodity** should not change otherwise the law will not apply.¹²
Example: Suppose a person purchases a second pen which is quite superior to the first. Because quality of the two pens is not same, utility of the second pen may not be less than the first.
2. **Suitable unit** If units of consumption are not of normal size, the law may not prove true. If a thirsty person drinks water by spoons, marginal utility may rise in the beginning.
3. **Continuous Consumption** e.g. A person drinks one glass of water in the morning and another at noon. Because of long interval between drinking of two glasses of water, the utility of second may not be less than the first's.
4. **Taste and Attitude of the consumer remains the same** A person eats one mango and has no desire for more. Meanwhile a doctor tells him that mangoes are useful for his health. This may change his attitude and he may get more utility from second mango than from the first.
5. **Income of the consumer does not change** otherwise this law will fail.

Examples: A person purchases one electric fan. He thinks that a second one has less utility. Meanwhile he comes to know that he has won a big prize on a prize-bond. Second fan may now appear to him quite attractive. Its utility may not be less than the first's.

Limitations

Sometimes, it appears that the law of diminishing utility does not apply to the following conditions. However, if we deeply think we find that such doubt arises because the assumptions and conditions of the law are ignored. Otherwise the law is universally applicable.

- (i) **Knowledge** If a person acquires more and more knowledge, his appetite for knowledge increases. Utility of further study rises.
However if a person reads the same book again and again with no interval, marginal utility will certainly fall.
- (ii) **Wealth and Money** Some people argue that since money can be used to purchase every good, marginal utility of money does not fall. Similarly, to a miser each addition in his wealth gives more utility.
Actually, money and wealth are no exception. If income of a person increases and he becomes rich, he is ready to spend more money on a commodity, which he previously thought not worthwhile.
- (iii) **Drugs and Narcotics** If a person is addicted to smoking, drinking or drugs, the more he uses these, the greater urge he feels. But we should remember that if he goes on using the commodity without any break, his desire for more will diminish.
- (iv) **Rare articles** (and antiques) Some people say that those who are collecting rare articles of historical importance, get increasing satisfaction with new additions to their collection. But it is not true. Suppose a person has two coins of Emperor Akbar's period. Now if he gets a third identical coin, he will not be as much pleased as he felt on finding the first coin.
- (v) **Articles of Fashion** for articles purchased just out of fashion or to show one's wealth, the marginal utility may increase instead of decreasing. But in this case too, the law is valid, provided we consider only one commodity. A person certainly loses interest in a commodity if he gets more of it.

Practical Importance

This is a basic law of economics with great practical importance.

1. **It explains why demand curve falls from left to right** When people get more quantity of a commodity, its marginal utility falls. It does not appear to them as attractive as before. They purchase additional quantity only when price is lowered.

¹² The commodity must be homogeneous i.e. all units are of same quality.

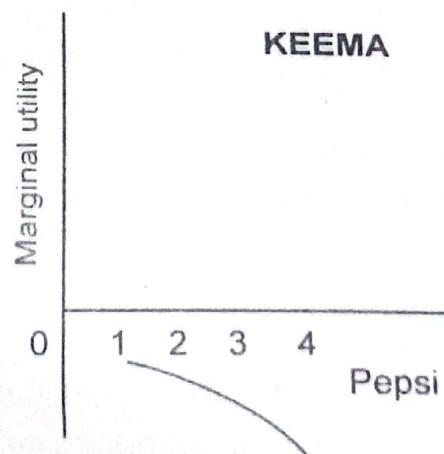
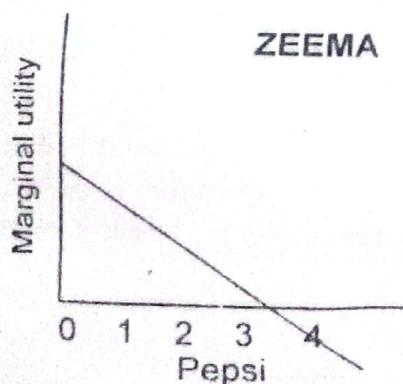
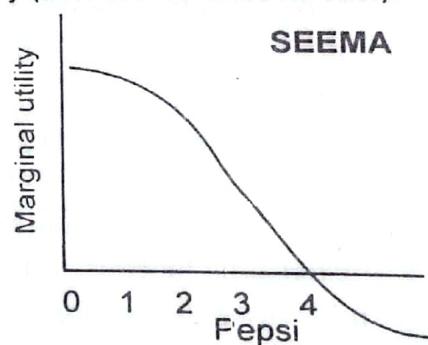
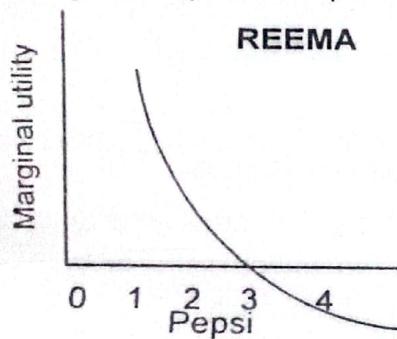
- 2. It provides basis for progressive taxation.** Progressive tax means that rate of a tax is higher for higher incomes. When income of a person increases MU of money falls. If the person with high income has to pay tax at the same rate as a poor person, he feels less burden. Therefore to do justice, rate of tax should be higher for the rich people.
- 3. It indicates the need for redistribution of wealth.** The socialists advocate equal distribution of wealth on the ground that marginal utility of money for the rich is lower than for the poor. They say that if some wealth is taken away from the rich and distributed among the poor, total utility of the community increases.
- 4. It explains how a consumer gets maximum utility.** In order to get maximum possible utility out of his income, a consumer should spend the amount in such a way that per rupee marginal utility of all commodities purchased becomes equal. Total utility is maximum when the following equation holds.

$$\frac{MU_A}{P_A} = \frac{MU_B}{P_B} = \dots = \frac{MU_N}{P_N}$$

Where MU_A is marginal utility of commodity A. And P_B shows its price.

Marginal utility for different persons and Shape of Marginal utility curve

The law of diminishing marginal utility states that as a person consumes more and more of a given commodity, the marginal utility eventually falls. However the law does not say that all people experience the same marginal utilities. The fig. below illustrates this point. Four girls' experience about drinking Pepsi is shown. Marginal utility curve for each one is downward sloping, yet each is quite different from others. Ms. KEEMA curve shows that from the very first Pepsi, she experiences disutility (because her throat is sour).



UTILITY MAXIMIZATION PRINCIPLE OR LAW OF EQUI-MARGINAL UTILITY

A very important fact of human life is the scarcity of resources and insufficient incomes. We cannot find a single person who feels that his income is enough to satisfy all of his wants. Thus, it is natural that people want to avoid wastage and try to spend their incomes in such a way that they get maximum total utility. For this purpose they have to compare the utilities of various commodities and use them according to the principle of *Equi-Marginal*. This principle¹³ or law can be defined as:

Statement: "Total utility from a given amount is maximum when it is spent on various goods in such a way that marginal utility of money spent on each good becomes equal". OR

OR

"Total utility of a given amount of money is maximum when it is spent on the principle of

$$\frac{MU_A}{P_A} = \frac{MU_B}{P_B} = \dots = \frac{MU_N}{P_N}$$

where MU_x represents marginal utility of commodity A and P_x is the price of A."

In order to achieve maximum possible utility, the consumer tries to balance the utilities at the margin. If he feels that by withdrawing a rupee from one good and spending on some other he can increase total utility, he will certainly do so. Since he substitutes goods of greater utility for goods of lesser utility, the law of equi-marginal utility is also called law of substitution. When a consumer succeeds in getting maximum utility, he is fully satisfied and has no desire to make any change in his purchase plan. So it is called consumer's equilibrium¹⁴. Take an example of a student who is preparing five subjects for his examination. He has distributed his time among these subjects. Now if he feels that by taking away one hour daily from English and spending it on Economics, he has the chance to lose 5 marks in English and add 20 marks in Economics, he will change the time distribution. On the other hand if he feels that by such change in time he will lose 10 marks in English and gain equal marks in Economics, he will not do it. In this situation he is in equilibrium.¹⁵

Explanation For its explanation, we make the following assumptions:

- (i) The consumer has a fixed amount to spend, say, 7 rupees.
- (ii) He can purchase only two goods (say, apples and bananas).
- (iii) The marginal utilities of the two goods are as given in the following table.
- (iv) Price of apple and banana is Re. 1 per unit.

¹³ Principle is general Here we are explaining the Principle of Equi-Marginal with reference to spending of money only. In fact this is a general principle. Whenever we have a limited amount of something compared to the needs, this principle will apply. Since time, money, land, capital, electricity and goods are all scarce, so to make best use of anything we will act upon principle of Equi-marginal.

¹⁴ Equilibrium: It represents a situation where there is no tendency to change.

¹⁵ Equilibrium for one product: See explanatory notes at the end of the chapter.

UTILITY MAXIMIZATION PRINCIPLE OR

LAW OF EQUI-MARGINAL UTILITY

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Quantity of Apples	Marginal Utility of Apples	Quantity of Bananas	Marginal Utility of Bananas
1	20	1	10
2	15	2	8
3	10	3	6
4	5	4	4
5	0	5	2

¹³ Principle is general Here we are explaining the Principle of Equi-Marginal with reference to spending of money only. In fact this is a general principle. Whenever we have a limited amount of something compared to the needs, this principle will apply. Since time, money, land, capital, electricity and goods are all scarce so to make best use of anything we will act upon this principle.

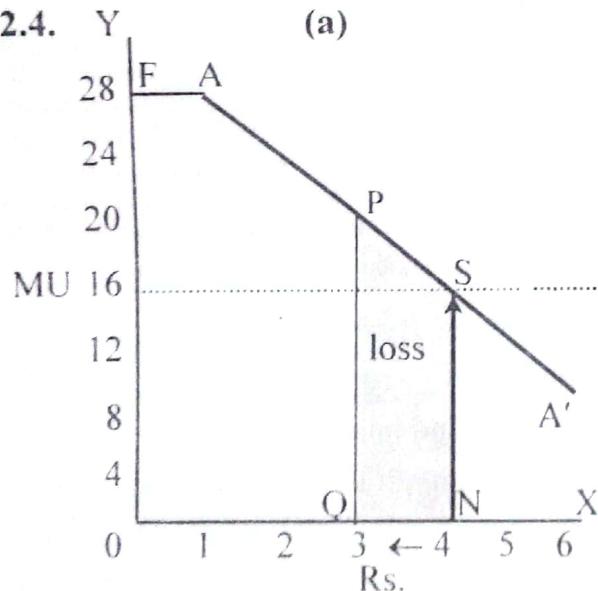
From the table we see that initially the consumer should spend on commodity A because its marginal utility is greater. When he has spent three rupees on A he finds that it is now better to spend on B. In this way by comparing the marginal utilities of the two commodities, he goes on spending the amount. When he has spent four rupees on A and three rupees on B the marginal utilities become equal and total utility is 142 which is maximum possible. If the consumer spends the income in any other way, then

marginal utilities become unequal and total utility is less than 142. For example, if he purchases the combination of 3 apples and 4 bananas, the marginal utilities are not equal and total utility is only 140. Thus, we see that total utility of the amount spent is maximum only when marginal utilities of both goods purchased are equal.

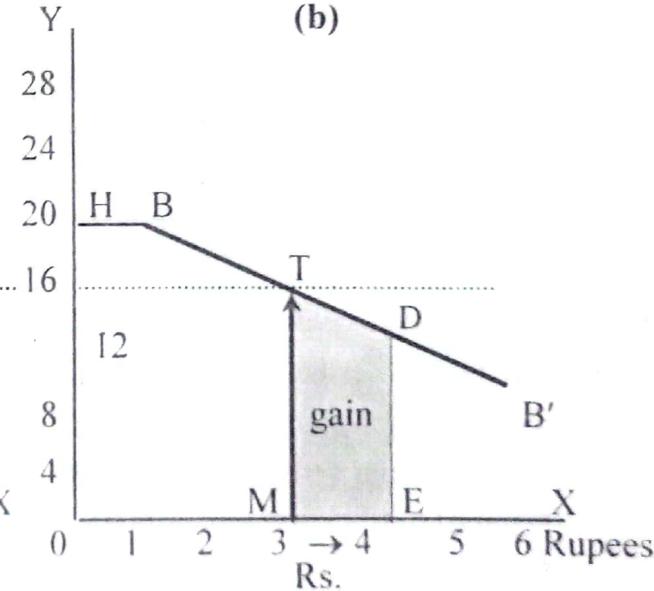
Graphic Method

The principle of EQUI-MARGINAL utility can also be explained in a diagram:

Fig. 2.4. (a)



(b)



In figures 2.4 (a) AA' represents marginal utility curve of apples while in figure 2.4. (b) BB' is the marginal utility curve of bananas. When the consumer spends ON rupees on A and OM rupees on B the marginal utilities from the two commodities are equal i.e. $SN = MT$. Total utility is equal to area OFASN + area OHBTM. If the consumer spends the amount in some other way, two results will follow:

- (a) Marginal utilities become unequal
- (b) Total utility decreases

Suppose the consumer takes away one unit of money (QN) from commodity A to commodity B. This increases MU of A to PQ and decreases MU of B to DE. The

marginal utilities are now unequal i.e. $PQ \neq DE$. By this transfer of money the decrease in total utility from A is area SNQP. While increase from B is area MTDE. Since the decreases in total utility is more than the increase, we reach the conclusion that total utility will be maximum only when marginal utilities of two goods purchased are equal.

We have seen that maximum satisfaction is obtained only when marginal utility of last rupee spent on one good is the same as marginal utility of the last rupee spent on the other. In general when the consumer is faced with many goods, he will make the best choice if follows the rule¹⁶.

$$\frac{MU_1}{P_1} = \frac{MU_2}{P_2} = MU \text{ of last rupee spent on any product}$$

Limitations

Following limitations make it difficult to apply it in practical problems.

- Incomes of the consumers, prices of goods and tastes are always changing.** But human beings are not calculating machines to constantly make calculations.¹⁷
- Indivisible goods** Many goods are not divisible into smaller units. It becomes impossible to substitute a little of one commodity for another. For example, a car cannot be purchased in parts.
- Custom and fashion** Some times people purchase goods just out of fashion or custom. They do not care to equalise marginal utilities.
- Time Problem** Many goods last long. It is difficult to compare their utilities; e.g. it is difficult to compare utility of a table lamp with that of chicken roast.
- Utility is not measurable** It is not possible to add utilities of different goods to find maximum utility. This fact makes the basis of the principle very weak.

Practical Importance

In spite of some limitations, Law of equi-marginal utility has practical importance.

- Consumer behaviour:** Every consumer, consciously or unconsciously tries to act according to this principle and spend his income in such a way that total satisfaction is maximum. He compares utilities and buys those commodities first which can give more satisfaction.
- Production planning** Every producer tries to use the most economical combination of factors. He achieves this goal when he **makes the marginal productivity of factors equal.**¹⁸ If the marginal product of a factor is relatively higher than that of another, the entrepreneur substitutes it for the other.
- Rewards of factors of production**, i.e. rent of land, interest of capital, wages of labour, all are determined according to their marginal productivity.
- Exchange of goods is also done according to this principle** People exchange a commodity of low utility for a commodity of high utility. Exchange of goods stops when marginal utilities become equal.

¹⁶ If price of sugar is Rs. 50/- and utility of one kg of sugar is 150, then per rupee utility is $MU/p = 150/50 = 2$.

¹⁷ **Hardships of Accounting** "Never ask of money spent..." See quotation at the beginning of the chapter.

¹⁸ He substitutes more productive factor for less productive one. This way he increases his profit.

Formula for Consumer's Equilibrium Or UTILITY-MAXIMISING RULE

To achieve the aim of maximisation of total utility from our resources, we compare the utilities of commodities, which we want to buy. In this effort, we face two problems.

Firstly, we need per rupee utilities. *Direct comparison of utilities, in most cases, is not possible.* Commodities have different units of measurement and different prices. For example, milk is available in **litres** and sugar in **kilograms**. How to compare their utilities? To make utilities comparable, we find their per rupee utilities. Suppose utility of 1 kg of sugar is 100 units and its price is Rs.20 per kg. Utility of 1 litre of milk is 60 and price is Rs.10 per litre. Per rupee utility from sugar will be (utility/price) = $100/20 = 5$ units. Per rupee utility of milk is $60/10 = 6$. Per rupee MU of milk is greater, so we spend the amount to buy milk.

Secondly, MU of commodities goes on falling We start buying milk because initially it has higher per rupee utility. When we have bought some milk, we find that its per rupee MU has become lower than per rupee MU of sugar. In order to get maximum total utility of our money, we must now spend on sugar.

From the above discussion we conclude that while spending money on various items, we must act as follows.¹⁹

(a) If $\frac{\text{MU of sugar}}{\text{Price of sugar}} > \frac{\text{MU of milk}}{\text{Price of milk}}$ i.e. $(\frac{\text{MU}_S}{P_S} > \frac{\text{MU}_M}{P_M})$
We should spend more on sugar and less on milk.

(b) If $\frac{\text{MU of sugar}}{\text{Price of sugar}} < \frac{\text{MU of milk}}{\text{Price of milk}}$ i.e. $(\frac{\text{MU}_S}{P_S} < \frac{\text{MU}_M}{P_M})$
We should spend more on milk and less on sugar.

(c) If $\frac{\text{MU of sugar}}{\text{Price of sugar}} = \frac{\text{MU of milk}}{\text{Price of milk}}$ i.e. $(\frac{\text{MU}_S}{P_S} = \frac{\text{MU}_M}{P_M})$
Neither we need to divert money from sugar to milk, nor from milk to sugar.

We are in equilibrium and are getting maximum possible utility.

We can generalise the above conclusion by including more than two commodities in the **Utility-maximising Rule** as

$$\frac{\text{MU}_A}{P_A} = \frac{\text{MU}_B}{P_B} = \dots = \frac{\text{MU}_N}{P_N}$$

Where MU_A = Marginal utility of commodity A and P_A = Price of A.

Example: We can explain the principle of utility maximising rule in a table. Suppose

Total amount for spending = Rs. 100

Price of sugar (P_S) = Rs. 20 Price of milk (P_M) = Rs. 10

Marginal utilities of the commodities are given in second and third columns.

¹⁹ Per rupee marginal utility is also called weighted marginal utility

Units of commodity	MU _S	MU _M	$\frac{MU_S}{P_S}$	$\frac{MU_M}{P_M}$
1	100	60	5	6
2	80	50	4	5
3	60	40	3	4
4	40	30	2	3
5	20	20	1	2
6	0	10	0	1

If the consumer spends Rs. 60 on sugar to get 3 k.g. and Rs. 40 on milk to get 4 litres, per rupee marginal utilities are equal i.e.

$$\frac{MU_S}{P_S} = \frac{60}{20} = 3 \quad \text{and} \quad \frac{MU_M}{P_M} = \frac{30}{10} = 3$$

$$\text{From 3 units of sugar } TU_S = 100 + 80 + 60 = 240$$

$$\text{From 4 units of milk } TU_M = 60 + 50 + 40 + 30 = 180$$

$$\text{Total utility} = 420$$

To prove our point let us try another combination. Spend Rs. 80 to get 4 kg of sugar. So, its MUs/P_S=2. Spend the remaining Rs. 20 on milk to get 2 litres of it. MU_M/P_M = 5. It means,

$$\frac{MU_S}{P_S} < \frac{MU_M}{P_M}$$

In the new situation,

$$TU_S = 100 + 80 + 60 + 40 = 280$$

$$TU_M = 60 + 50 = 110$$

$$\text{Total utility} = 390$$

We find that our new combination, in which per rupee marginal utilities are not equal, gives less total utility. We can try many other combinations but total utility will always be less than 420 because per rupee marginal utilities will not be equal. Hence the result: total utility of an amount is maximum when

$$\frac{MU_A}{P_A} = \frac{MU_B}{P_B} = \dots = \frac{MU_N}{P_N}$$

Rational people think in terms of margin and arrive at best decisions

CONSUMER THEORY and INDIFFERENCE CURVES

Indifference curve is a technique to explain the behaviour of a consumer in buying of goods and services. Before the introduction of this concept, the economists used to explain the consumer behaviour through utility approach. According to utility analysis, a consumer compares marginal utilities of goods and purchases various goods in such a way that total utility of the amount spent is maximum. When prices of goods or income of a consumer changes, he re-schedules his purchase plan and buys those goods more which become cheaper. Utility approach is useful because it gives us insight into how consumers make decisions. However it has an important drawback i.e. utility is a subjective concept depending upon the personal tastes and feelings of individuals. There is no objective measure to express utility. To overcome this shortcoming of utility analysis,

method of indifference curves is used. In this method, there is no need to directly measure utilities of goods. Rather utilities of bundles of commodities are compared.²⁰

Indifference curves

An indifference curve is a graph which shows all combinations of two goods that give equal satisfaction to the consumer.²¹

Because of equal satisfaction, the consumer is *indifferent*²² among the various combinations on an indifference curve.

To draw an indifference curve, we make a schedule of pairs of two goods which are equally preferred by the consumer. Suppose the consumer can buy two goods x (food) and y (cloth) in different combinations. If he buys 1 unit of x and 15 units of y, he gets a certain level of satisfaction. Now there are many other pairs of x and y, which have the same level of satisfaction. Let these pairs be as shown in the table 2.4

Indifference curve analysis is an approach to the study of consumer behaviour that requires no numerical measure of utility.

Table 2. 4 Indifference Schedule

Our assumption about this schedule is that **all pairs from A to E have the same satisfaction** for the consumer i.e. Pair A (1 x + 15 y) has as much satisfaction as any other pair.

Combinations	Units of food + Units of cloth	
	x	y
A	1	15
B	2	10
C	3	7
D	4	5
E	5	4

When the values of x and y of this table are shown in a graph, we get a downward sloping curve which is called indifference curve. It is shown in the figure.2.5

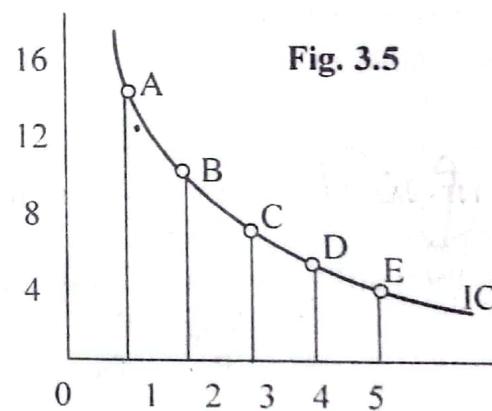


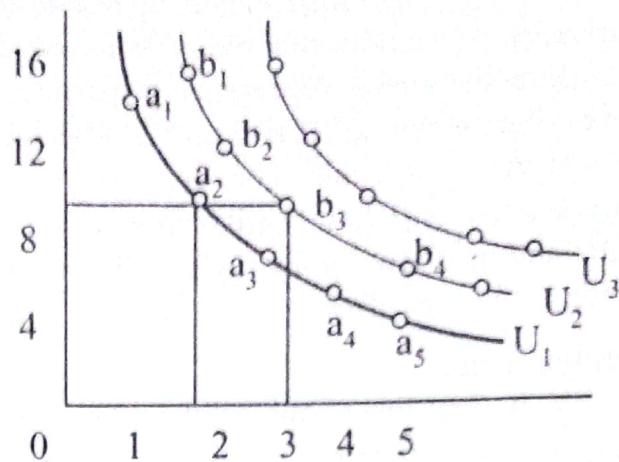
Fig. 3.5

²⁰ In utility approach we assume that utility is measurable in some imaginary units and utilities of goods can be added. This concept is called **cardinal utility**. Indifference curve approach assumes that utilities cannot be added. They can be compared only without measuring in any units. This concept is called **ordinal utility**.

²¹ **Baskets of goods** Instead of two goods we may also say **two baskets of goods** e.g. Basket A may contain 10 units of food plus 30 units of cloth and Basket B may have 12 units of food and 25 units of cloth.

²² Indifference is opposite of preference. An indifferent person finds no difference between various combinations. So he has no preference. All are equally preferred and equally attractive.

If we show many indifference curves, each for a different level of satisfaction, we get a set of indifference curves called **Indifference Map**. A higher indifference curve shows higher level of satisfaction. In the figure, every combination on U_2 curve is preferable to all combinations of U_1 curve. Combination b_3 is clearly preferable to combination a_3 because b_3 contains more of x commodity.



Assumptions

To draw indifference curve, we make some assumptions

- Consumer is rational and aims to maximise utility. As a normal human being he prefers more quantity of a good to less.
- Consumer can tell which combinations of goods he prefers and among which he is indifferent

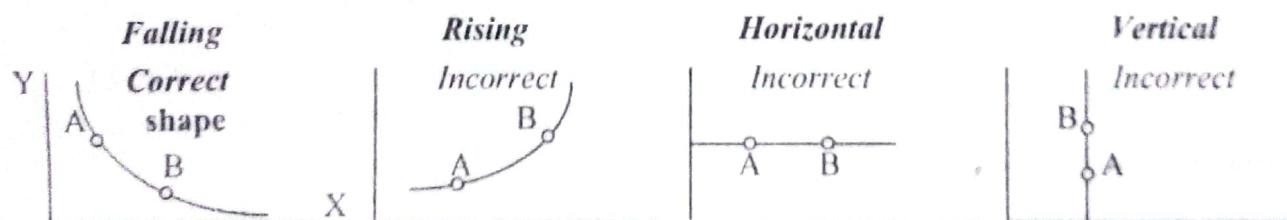
Properties The indifference curves have certain properties.

- They slope downward
- They are convex to the origin
- They do not intersect each other.

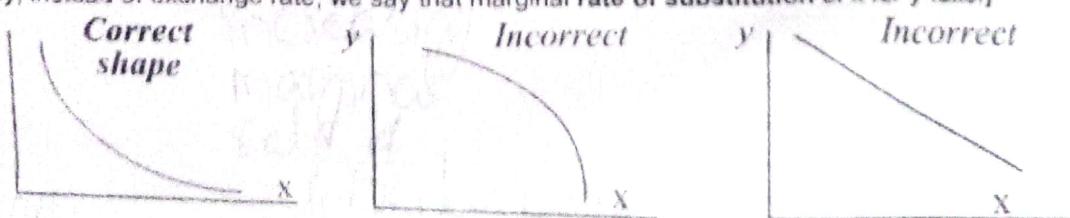
An indifference curve is a graphical picture of consumer's preferences

Let us see why an indifference curve must have these properties.

Firstly, an indifference curve must have a **negative slope**. This is because when we change from pair A to pair B by increasing the quantity of x, then the quantity of y must decrease, otherwise the satisfaction of new pair will not remain equal to the first.



Secondly, As the consumer gets more quantity of x, utility of new units of x falls. So the consumer in order to get an extra x, does not give up the same quantity of y. That is, the exchange rate of y for x goes on falling and he leaves less and less quantity of y for an extra unit of x. This fact makes the indifference curve **convex to the origin**.²³ [Technically, instead of exchange rate, we say that marginal rate of substitution of x for y falls.]



²³ Convex to the origin means the bend is towards origin.

Two indifference curves cannot intersect each other.

Thirdly, any two *indifference curve cannot intersect*. We know that every point on an indifference curve represents a particular level of satisfaction. If two curves intersect, it means that the common point of intersection will have satisfaction equal to satisfaction of two points which lie on two different curves. This is not possible.

Budget Line

A budget line shows all those combinations of two goods x and y which a consumer can buy at given prices of goods, using up all income he wants to spend.

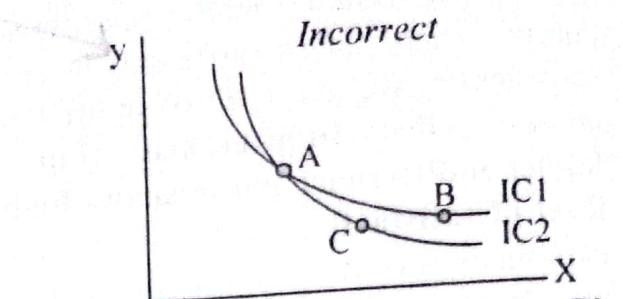
To draw a budget line we need two kind of information

- income to be spent on x and y goods
- prices — price of x and price of y

Example: a consumer has Rs.100 to spend. Price of x is Rs. 20 per unit and price of y is Rs.10. He may buy different combinations as shown in the table.

Table 2.5

x	y	Total amount
0	10	100
1	8	100
2	6	100
3	4	100
4	2	100
5	0	100



Satisfaction of A can be either equal to B's or C's, but not both.

Incorrect

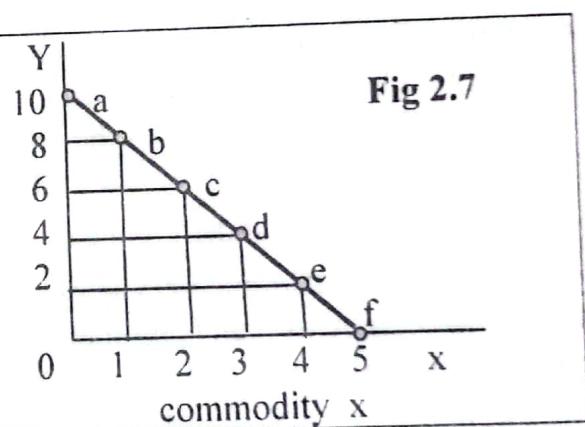


Fig 2.7

The consumer can afford to buy anyone from the combinations a, b, c, d, e and f. However, he will choose that one which gives him highest satisfaction.

Change of Budget Line

The position of budget line depends on two things; income and prices. If there is any increase or decrease in either income or prices, budget line will shift.

Effect of change in income

When income increases, consumer can afford more of the two commodities. So budget line shifts to the right. In case income falls budget line will shift leftwards.

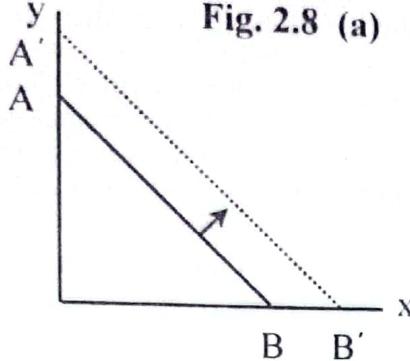


Fig. 2.8 (a)

Effect of change in price

When price changes the budget line changes its **slope** e.g. when price of x falls the consumer can buy more of x so budget line moves right on x -axis.

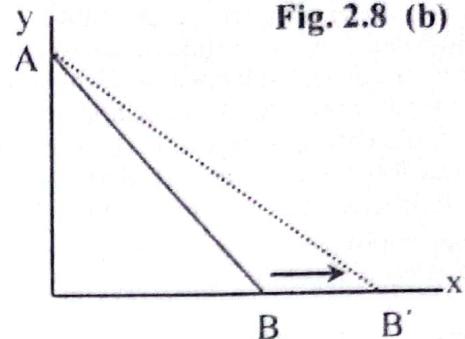


Fig. 2.8 (b)

Consumer equilibrium (Consumer's Choice)

When a consumer has chosen a combination of commodities which he thinks has the highest satisfaction, he is said to be in equilibrium.

An indifference map describes personal **tastes and preference** pattern of the consumer. The budget line shows possible combinations which he *can afford to buy* with given amount. If we know budget line and indifference map we can easily tell what particular combination he would select. Equilibrium of the consumer means that by spending the given amount, the consumer gets maximum possible satisfaction.

Consider fig. 2.9. The consumer can buy any combination like b, e and c on the budget line. But point e is the best, because compared to other points this gives maximum satisfaction. Here IC_2 is tangent to BL. If he chooses combination a, he is not using up the entire amount and he is at lower IC_1 having a lower satisfaction. Similarly b or c points lie on lower IC . So point e is the equilibrium point. The consumer would like to reach higher IC_3 , but he has not enough money for this. He can not go outside BL.

The point where an indifference curve is tangent to budget line is the equilibrium point. This point (combination of x and y) shows the maximum satisfaction which the consumer can get out of his income he has allocated to spend on y and x .

Aim of the Consumer
Every consumer wants to spend the available amount of money in such a way that total utility he derives from goods bought is maximum

Equilibrium of the consumer means that by spending the given amount, the consumer gets maximum possible satisfaction.

Fig. 2.9

