MODULE-3 THEORY OF CONSUMER BEHAVIOR

Consumer equilibrium

When consumers make choices about the quantity of goods and services to consume, it is presumed that their objective is to **maximize total utility.** In maximizing total utility, the consumer faces a number of **constraints**, the most important of which are the consumer's income and the prices of the goods and services that the consumer wishes to consume. The consumer's effort to maximize total utility, subject to these constraints, is referred to as the **consumer's problem.** The solution to the consumer's problem, which entails decisions about how much the consumer will consume of a number of goods and services, is referred to as **consumer equilibrium.**

Determination of consumer equilibrium.

Consider the simple case of a consumer who cares about consuming only two goods: good 1 and good 2. This consumer knows the prices of goods 1 and 2 and has a fixed income or budget that can be used to purchase quantities of goods 1 and 2. The consumer will purchase quantities of goods 1 and 2 so as to completely exhaust the budget for such purchases. The actual quantities purchased of each good are determined by the condition for consumer equilibrium, which is

$$\frac{\text{marginal utility of good 1}}{\text{price of good 1}} = \frac{\text{marginal utility of good 2}}{\text{price of good 2}} = \cdots = \frac{\text{marginal utility of good } N}{\text{price of good } N}$$

This condition states that the marginal utility per dollar spent on good 1 must equal the marginal utility per dollar spent on good 2. If, for example, the marginal utility per dollar spent on good 1 were higher than the marginal utility per dollar spent on good 2, then it would make sense for the consumer to purchase more of good 1 rather than purchasing any more of good 2. After purchasing more and more of good 1, the marginal utility of good 1 will eventually fall due to the law of diminishing marginal utility, so that the marginal utility per dollar spent on good 1 will eventually equal that of good 2. Of course, the amount purchased of goods 1 and 2 cannot be limitless and will depend not only on the marginal utilities per dollar spent, but also on the consumer's budget.

An example. To illustrate how the consumer equilibrium condition determines the quantity of goods 1 and 2 that the consumer demands, suppose that the price of good 1 is $2 per unit and the price of good 2 is $1 per unit. Suppose also that the consumer has a budget of $5. The marginal utility (MU) that the consumer receives from consuming 1 to 4 units of goods 1 and 2 is reported in Table . Here, marginal utility is measured in fictional units called utils, which serve to quantify the consumer's

additional utility or satisfaction from consuming different quantities of goods 1 and 2. The larger the number of utils, the greater is the consumer's marginal utility from consuming that unit of the good. Table also reports the ratio of the consumer's marginal utility to the price of each good. For example, the consumer receives 24 utils from consuming the first unit of good 1, and the price of good 1 is $2. Hence, the ratio of the marginal utility of the first unit of good 1 to the price of good 1 is 12.

TABLE 1 Illustration of Consumer Equilibrium. Price of good 1 = $2, Price of good 2 = $1, Budget = $5

Units of good 1	*MU* of good 1	*MU*/price of good 1	Units of good 2	*MU* of good 2	*MU*/price of good 2
1	24	12	1	9	9
2	18	9	2	8	8
3	12	6	3	5	5
4	6	3	4	1	1

The consumer equilibrium is found by comparing the marginal utility per dollar spent (the ratio of the marginal utility to the price of a good) for goods 1 and 2, subject to the constraint that the consumer does not exceed her budget of $5. The marginal utility per dollar spent on the first unit of good 1 is greater than the marginal utility per dollar spent on the first unit of good 2(12 utils > 9 utils). Because the price of good 1 is $2 per unit, the consumer can afford to purchase this first unit of good 1, and so she does. She now has $5 − $2 = $3 remaining in her budget. The consumer's next step is to compare the marginal utility per dollar spent on the second unit of good 1 with marginal utility per dollar spent on the first unit of good 2. Because these ratios are both equal to 9 utils, the consumer is indifferent between purchasing the second unit of good 1 and first unit of good 2, so she purchases both. She can afford to do so because the second unit of good 1 costs $2 and the first unit of good 2 costs $1, for a total of $3. At this point, the consumer has exhausted her budget of $5 and has arrived at the consumer equilibrium, where the marginal utilities per dollar spent are equal. The consumer's equilibrium choice is to purchase 2 units of good 1 and 1 unit of good 2.

Marginal utility – Law of diminishing marginal utility

The law of diminishing marginal utility states that commodities become less valuable as more of them are acquired. The British economist Alfred Marshall explained the law as such: "During the course of consumption, as more and more units of a commodity are used, every successive unit gives utility with a diminishing rate, provided other things remaining the same; although, the total utility increases."

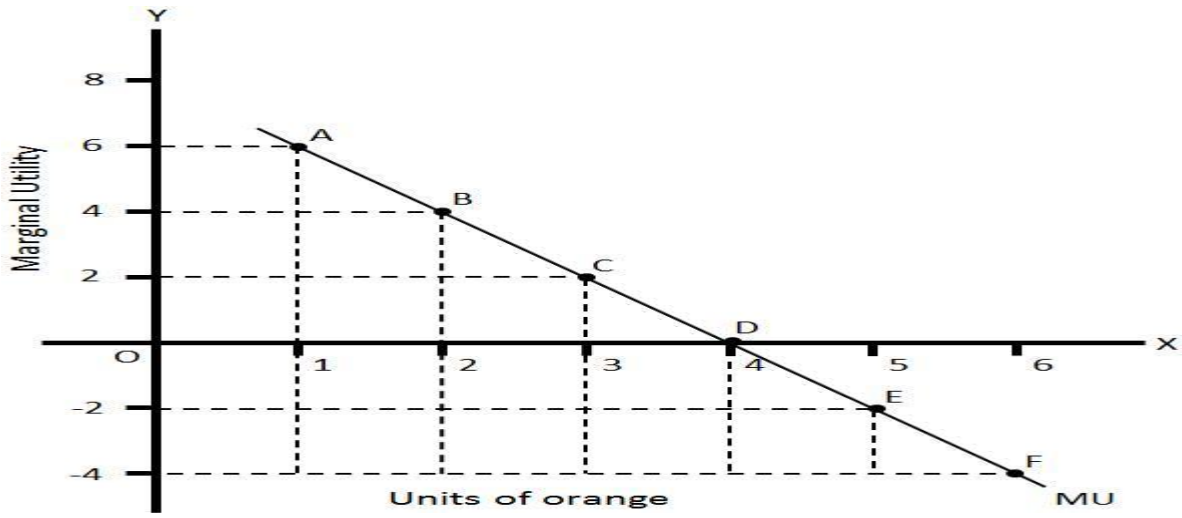
Example to Demonstrate Law of Diminishing Marginal Utility

This law can be illustrated with the help of a table shown below:

Units of Orange	Marginal Utility
1	6
2	4
3	2
4	0
5	-2
6	-4

The table shows that when a consumer consumes 1st unit of orange he derives the marginal utility equal to 6utils. As the consumer consumes 2nd and 3rd units of orange, the marginal utility is declined from 4utils to 2utils respectively.
When he consumes 4th unit of orange the marginal utility becomes zero, which is called the point of satiety. Similarly, from the consumption of 5th and 6th units of orange, the marginal utility becomes negative, i.e., he gets disutility instead of utility from these units of consumption.
Thus, the table shows that a consumer consumes more and more units of a commodity at a certain period of time, the marginal utility declines, becomes zero and even negative.

This law can be further explained with the help of a diagram:



In the figure, X-axis represents units of orange and Y-axis represents utility. MU is the marginal utility curve which slopes downward from left to right. It means that as a consumer consumes more and more units of a commodity, the marginal utility he derives from the additional unit of consumption goes on declining, becomes zero(at point D) and even negative(at point E and F.)

Indifference curve and Properties

An indifference curve is a graph showing combination of two goods that give the consumer equal satisfaction and utility. Each point on an indifference curve indicates that a consumer is indifferent between the two and all points give him the same utility.

Description: Graphically, the indifference curve is drawn as a downward sloping convex to the origin. The graph shows a combination of two goods that the consumer consumes.

An indifference curve is a curve that represents all the combinations of goods that give the same satisfaction to the consumer. Since all the combinations give the same amount of satisfaction, the consumer prefers them equally. Hence the name indifference curve.

Here is an example to understand the indifference curve better. Peter has 1 unit of food and 12 units of clothing. Now, we ask Peter how many units of clothing is he willing to give up in exchange for an additional unit of food so that his level of satisfaction remains unchanged.

Peter agrees to give up 6 units of clothing for an additional unit of food. Hence, we have two combinations of food and clothing giving equal satisfaction to Peter as follows:

1. 1 unit of food and 12 units of clothing
2. 2 units of food and 6 units of clothing

By asking him similar questions, we get various combinations as follows:

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

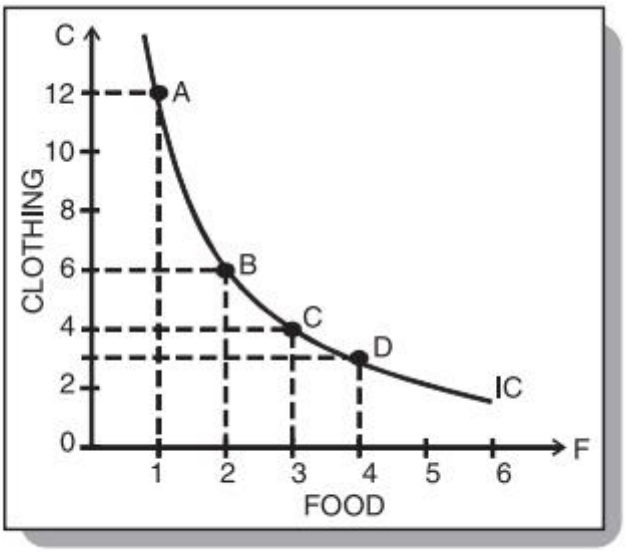


Fig. 1 : A Consumer's Indifference Curve

the diagram shows an Indifference curve (IC). Any combination lying on this curve gives the same level of consumer satisfaction.

Budget line

A budget line is a straight line that slopes downwards and consists of all the possible combinations of the two goods which a consumer can buy at a given market price by allocating all his/her income. It is an entirely different concept from that of an indifference curve, though they are both are essential for consumer equilibrium

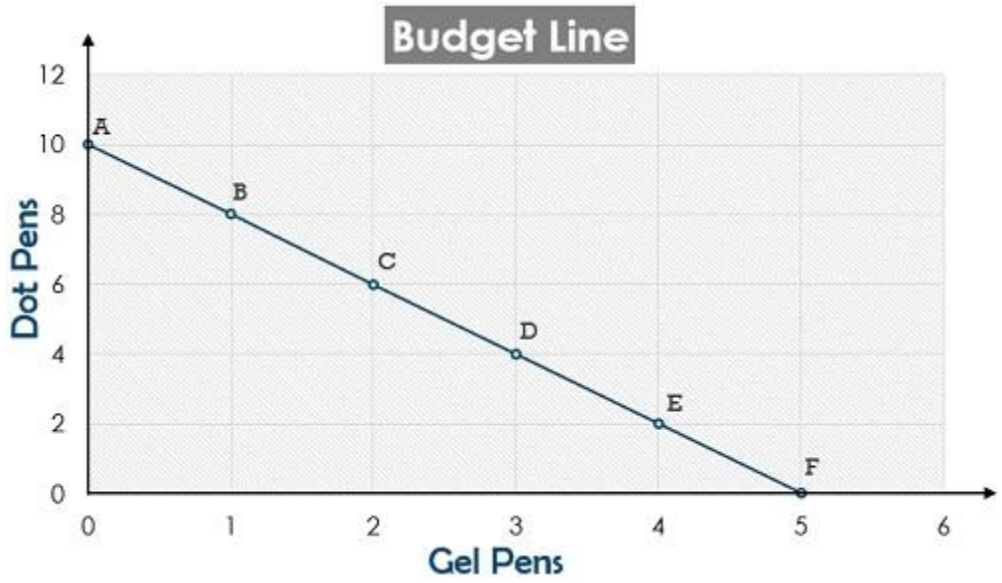
The two **essential components** of a budget line are:

- The purchasing power of a consumer, i.e. his/her income;
- The market price of both commodities.

Example: A person has 50/- for buying pens. He/She has the following options for allocating his/her amount such that he/she derives the maximum utility from limited income:

Budget Schedule			
Combination	Gel Pens (@ 10/- Per Pen)	Dot Pens (@ 5/- Per Pen)	Budget Allocation
A	0	10	10*0+ 5*10 = 50
B	1	8	10*1+ 5*8 = 50
C	2	6	10*2+ 5*6 = 50
D	3	4	10*3+ 5*4 = 50
E	4	2	10*4+ 5*2 = 50
F	5	0	10*5+ 5*0 = 50

The above Budget schedule can be plotted on a graph to obtain the appropriate budget line for this instance;



Income – Price – Substitution effect

Changes in Price and Shift in Budget Line:

Now, what happens to the price line if either the prices of goods change or the income changes. Let us first take the case of the changes in prices of the goods. This is illustrated in Fig. 8.16. Suppose the budget line in the beginning is BL, given certain prices of the goods X and Y and a certain income. Suppose the price of X falls, the price of Y and income remaining unchanged.

Now, with a lower price of X the consumer will be able to purchase more quantity of X than before with his given income. Let at the lower price of X, the given income

purchases OL' of X which is greater than OL. Since the price of Y remains the same, there can be no change in the quantity purchased of good Y with the same given income and as a result there will be no shift in the point B. Thus, with the fall in the price of good X, the consumer's money income and the price of Y remaining constant, the price line will take the new position BL'.

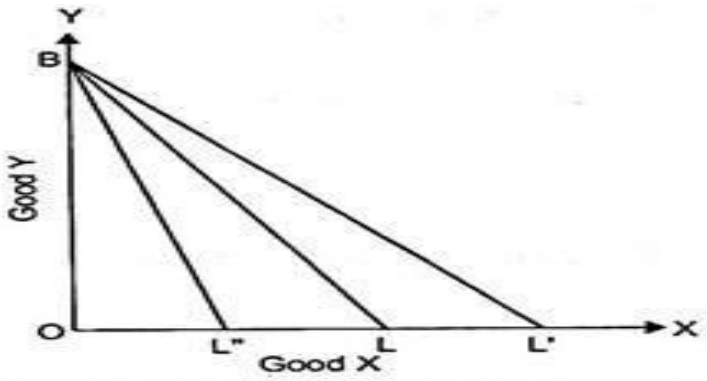


Fig. 8.16. Changes in Budget Line as a Result of Changes in Price Good X

Now, what will happen to the budget line (initial budget line BL) if the price of good X rises, the price of good Y and income remaining unaltered. With higher price of good X, the consumer can purchase smaller quantity of X, say OL", than before. Thus, with the rise in price of X the price line will assume the new position BL".

Fig. 8.17 shows the changes in the price line when the price of good Y falls or rises, with the price of X and income remaining the same. In this the initial budget line is BL.

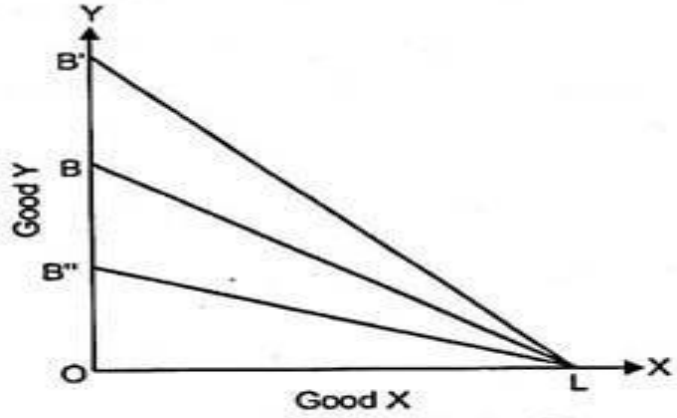


Fig. 8.17. Changes in Price Line as a Result of Changes in price of Good Y

With the fall in price of good Y, other things remaining unchanged, the consumer could buy more of Y with the given money income and therefore budget line will shift to LB'. Similarly, with the rise in price Y, other things being constant, the budget line will shift to LB".

Changes in Income and Shifts in Budget line:

Now, the question is what happens to the budget Y line if the income changes, while the prices of goods remain the same. The effect of changes in income on the budget line is shown in Fig. 8.18. Let BL be the initial budget line, given certain prices of goods and income.' If the consumer's income increases while the prices of both goods X and Y remain unaltered, the price line shifts upward (say, to B'L') and is parallel to the original budget line BL.

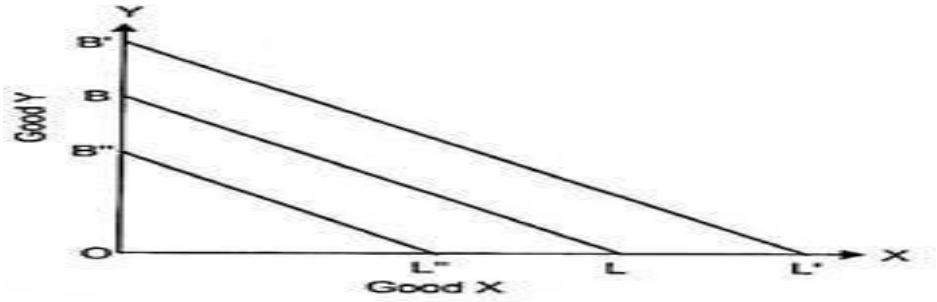


Fig. 8.18. Shifts in Budget Line as a Result of Changes in Income

This is because with the increased income the consumer is able to purchase proportionately larger quantity of good X than before if whole of the income is spent on X, and proportionately greater quantity of good Y than before if whole of the income is spent on Y. On the other hand, if the income of the consumer decreases, the prices of both goods X and remaining unchanged, the budget line shifts downward (say, to B"L") but remains parallel to the original price line BL. This is because a lower income will purchase a proportionately smaller quantity of good X if whole of the income is spent Changes in Income on X and proportionately smaller quantity of good Y if whole of the income is spent on Y.

It is clear from above that the budget line will change if either the prices of goods change or the income of the consumer changes.

Substitution effect:

Indifference curve along the income consumption curve as if his money income had been increased, prices of X and Y remaining unchanged. Thus, a given change in price can be thought of as an equivalent to an appropriate change in income.

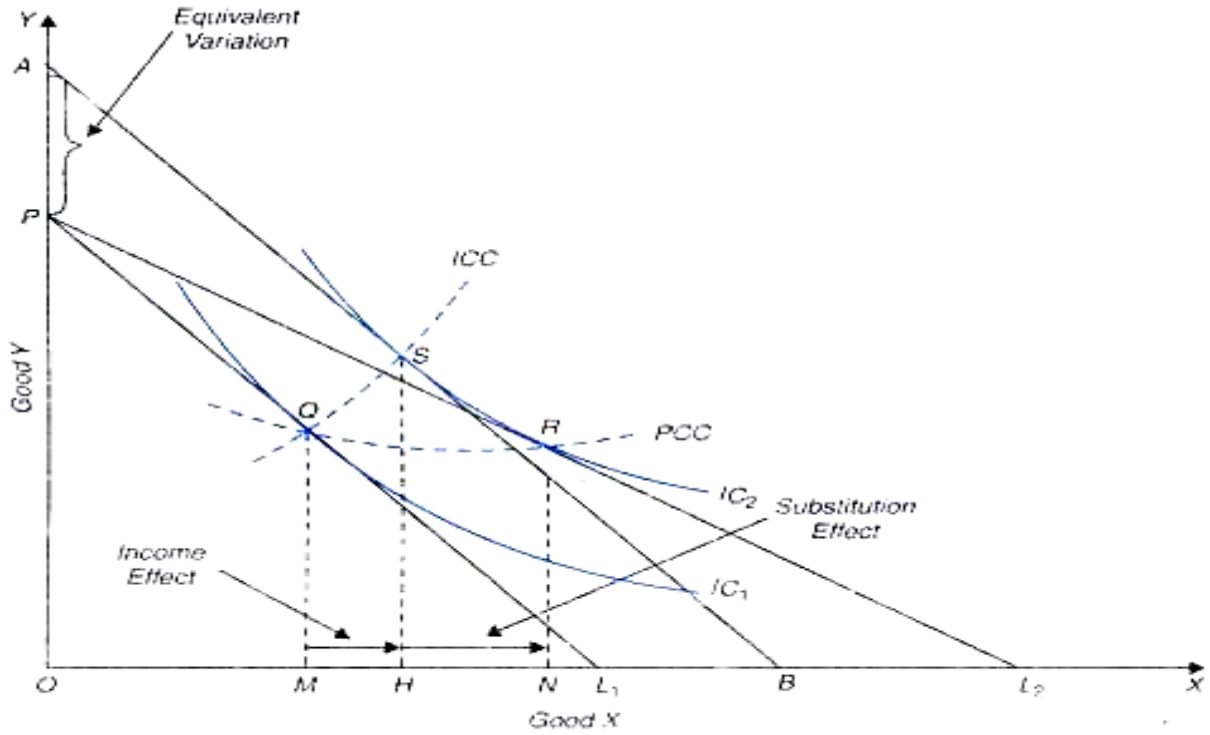


Fig. 8.44. *Price Effect Split Up into Income and Substitution Effects through Equivalent Variation Method*

It will be seen from Fig. 8.44 that with price line PL_1, the consumer is in equilibrium at Q on indifference curve IC_1. Suppose price of good X falls, price of Y and his money income remaining unaltered, so that budget line is now PL_2. With budget line PL_2, he is in equilibrium at R on indifference curve IC_2. Now, a line AB is drawn parallel to PL_1 so that it touches the indifference curve IC_2 at S.

It means that the increase in real income or purchasing power of the consumer as a result of the fall in price of X is equal to PA in terms of Y or L_1B in terms of X Movement of the consumer from Q on indifference curve IC_1 to S on the higher indifference curve IC_2 along the income consumption curve is the result of income effect of the price change. But the consumer will not be finally in equilibrium at S.

This is because now that X is relatively cheaper than Y, he will substitute X, which has become relatively cheaper, for good Y, which has become relatively dearer. It will be gainful for the consumer to do so. Thus the consumer will move along the indifference curve IC_2 from S to R. This movement from S to R has taken place because of the change in relative prices alone and therefore represents substitution effect. Thus the price effect can be broken up into income and substitution effects, showing in this case substitution along the subsequent indifference curve.