Law of Equi-Marginal Utility

In the real world, a consumer may purchase more then one commodity. Let us assume that a consumer purchases two goods X and Y. How does a consumer spend his fixed money income in purchasing two goods so as to maximize his total utility?

The law of equi-marginal utility tells us the way how a consumer maximizes his total utility.

Before elaborating this law, let us assume:

- a. The consumer acts rationally.
- b. Tastes and preferences, money income, prices of goods, etc., remain constant.

- The equi-marginal principle is based on the law of diminishing marginal utility. The equi-marginal principle states that a consumer will be maximizing his total utility when he allocates his fixed money income in such a way that the utility derived from the last unit of money spent on each good is equal.
- Meaning It is the second important **law** of the **utility** analysis. The **law** states that in order to get maximum satisfaction, a consumer should spend his limited income on different commodities in such a way that the last rupee spent on each commodity yields him **equal marginal utility**.

Explanation

- Suppose a man purchases two goods X and Y whose prices are P_X and P_Y, respectively. As he purchases more of X, his MU_X declines while MU_Y rises. Only at the margin the last unit of money spent on X has the same utility as the last unit of money spent on Y and the person thereby maximizes his satisfaction.

- Only when this is true, the consumer will not be distributing his money in buying good X and Y, since by reallocating his expenditure he cannot increase his total utility.

This condition for a consumer to maximize utility is usually written in the following form:

- $MU_X/P_X = MU_Y/P_Y$
- So long as MU_Y/P_Y is higher than MU_X/P_X, the consumer will go on substituting Y for X until the marginal utilities of both X and Y are equalized.
- The marginal utility per rupee spent is the marginal utility obtained from the last unit of good consumed divided by the price of good (i.e., MU_X/P_X or MU_Y/P_Y). A consumer thus gets maximum utility from his limited income when the marginal utility per rupee spent is equal for all goods.

Example

- This equi-marginal principle or the law of substitution can be explained in terms of an arithmetical example. In Table 2.6, we have shown marginal utility schedule of X and Y from the different units consumed. Let us also assume that prices of X and Y are Rs. 4 and Rs. 5, respectively.

Table 2.6: Marginal Utility Schedules

Number of units consumed	MU_X	MU_Y
1	40	55
2	36	50
3	32	30
4	28	20
5	24	15
6	20	5

- MU_X and MU_Y schedules show diminishing marginal utilities for both goods X and Y from the different units consumed. Dividing MU_X and MU_Y by their respective prices we obtain weighted marginal utility or marginal utility of money expenditure. This has been shown in Table 2.7.

Table 2.7: MU_X / P_X and MU_Y / P_Y Schedules

Number of units consumed	MU_X / P_X	MU_Y / P_Y
1	10	11
2	9	10
3	8	6
4	7	4
5	6	3
6	5	1

- MU_X/P_X and MU_Y/P_Y are equal to 6 when 5 units of X and 3 units of Y are purchased. By purchasing these combinations of X and Y, the consumer spends his entire money income of Rs. 35 (= Rs. 4 x 5 + Rs. 5 x 3) and, thus, gets maximum satisfaction [10 + 9 + 8 + 7 + 6] + [11 + 10 + 6] = 67 units. Purchase of any other combination other than this involves lower volume of satisfaction.

Example:2

We assume that

- The consumer has Rs.5 to spent.
- He has to spend his income on two goods A and B.
- The price of each good is Rs.1 per unit.

THE FOLLOWING TABLE WILL MAKE THE LAW OF EQUITY MARGINAL UTILITY MORE CLEAR.

Units of Money	MU of A	MU of B
Rs.1	10	8
Rs.2	8	6
Rs.3	6	4
Rs.4	4	2
Rs.5	2	0
Total Utility	30	20

FROM THE ABOVE TABLE,

- There are three columns in the above table. First column measures the Unit of Money, second MU of A and third column measures MU of B.
- To get maximum satisfaction a consumer will spend Rs. 3/- on A and Rs. 2/- on B. Because in this way the total amount of utility will be maximum.
- When a consumer will spend Rs. 3/- on A he will get = 10 + 8 + 6 = 24 by spending two rupees on B he will get = 8 + 6 = 14 Total amount of satisfaction will be 24 + 14 = 38.
- If he will adopt any other method, he would not get such amount of utility. So we find that when the marginal utilities (6 = 6) are equal the total utility is maximum.
- No other combination will give him more satisfaction except this one.

LIMITATIONS OF THE LAW

- 1. Immeasurable Concept: The concept of utility is immeasurable so it is very difficult to behave according to the law.
- 2. Carelessness: Sometimes due to ignorance people do not obtain the maximum advantage by equating the marginal utilities.
- 3. Indivisible Units: If the unit of expenditure is indivisible then this law will not operate.
- 4. Customs: People are slave of customs and traditions, so they use the goods like gold even there is less utility.
- 5. Freedom of choice: If there is no perfect freedom to choose between various commodities, then the law will not operate.