

LAW OF DIMINISHING MARGINAL UTILITY

The change in the total utility resulting from one unit change in the consumption of a commodity per unit of time is called marginal utility. The marginal utility of a commodity diminishes as the consumer gets larger quantities of it.

According to Alfred Marshall

"The additional benefits which a person derives from an increase of his stock of a thing diminishes with every increase in the stock that he already has".

Definition

"Other things remaining same when a person takes successive units of a commodity or service, the marginal utility diminishes constantly".

Assumptions:

These are the assumptions of the Law of diminishing Marginal Utility.

1. Cardinal measurement

The utility is measurable and a person can express the utility derived from a commodity in quantitative terms such as 2 util, 4 util, 7 util etc.

2. Rationality

A rational consumer aims at the maximization of his utility by consuming successive units of a commodity.

3. Constant marginal utility of money

It is a necessary assumption that a standard unit of measurement is money and its marginal utility is assumed to be constant.

4. Continuous use

A commodity is being taken continuously. Any gap between the consumption of a commodity should be suitable.

- 6. **A definite quantity of a commodity**
There should be proper units of a commodity consumed by the consumer.
- 7. **Homogeneity of units of a commodity**
We have assumed that various units of the commodity are homogeneous in characteristics i.e. label, brand, quality, quantity etc.
- 8. **Taste remains same**
The taste of the consumer is assumed to be constant during the consumption of successive units of a commodity.
- 9. **Constant Income**
Income of the consumer remains constant during the operation of this law.
- 10. **Divisibility**
It is assumed that a commodity is divisible which a consumer takes its units successively.
- 11. **No Change in Fashion**
This law is proved to be correct if there is no change in fashion. For example, if there is a fashion of fitted shirt, then there will be no utility of open shirts.
- 12. **No change in prices of substitutes**
It is assumed in the law of diminishing MU that the prices of substitutes remain constant otherwise the utility of other things can affect the law. For example, the demand of CNG increases due to rise in the prices of petroleum and these prices effect the utility of C.N.G.

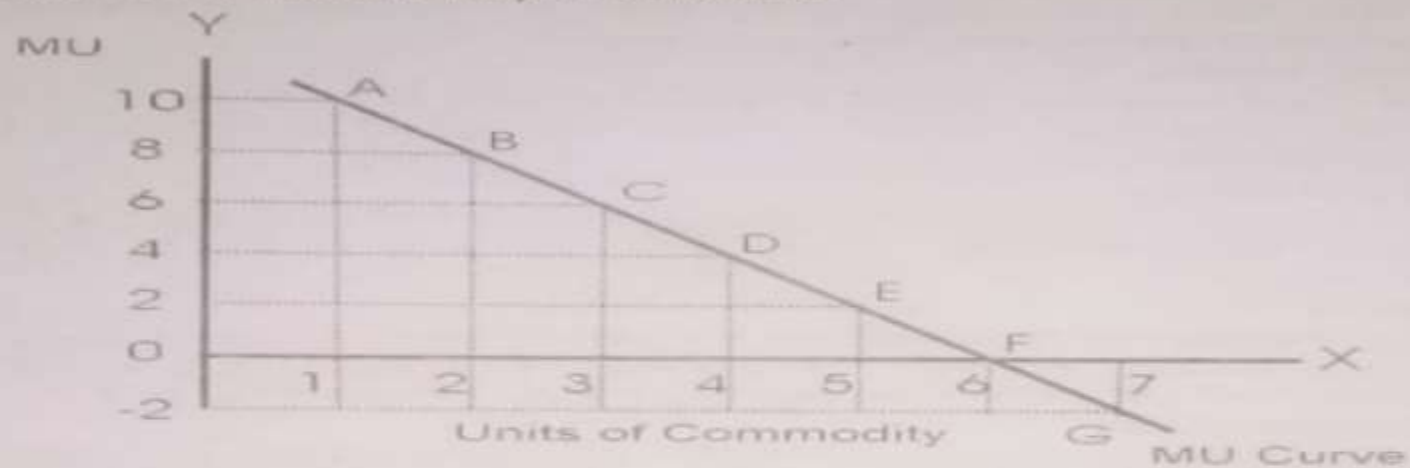
Explanation of the law

Other things remaining same, the more we have of a good, the less we want still more of that. In other words, "other things remaining same, marginal utility becomes smaller and smaller the more of a commodity a person has". We assume that a man is very thirsty. He takes the glasses of water successively. The marginal utility of the successive glasses of water decreases, ultimately, he reaches the point of satiety. After this point the marginal utility becomes negative, if he is forced further to take a glass of water. This behaviour of the consumer is indicated in the schedule.

Units of Commodity.	Marginal Utility	Total Utility
1st glass	10	10
2nd glass	8	18
3rd glass	6	24
4th glass	4	28
5th glass	2	30
6th glass	0	30
7th glass	-2	28

On taking the 1st glass of water, the consumer gets 10 utils of utility, because he is very thirsty. When he takes 2nd glass of water his marginal utility goes down to 8 utils of utility because his thirst has been partly satisfied. This process goes on until the marginal utility drops down to zero which is the saturation point. By taking the 7th glass of water, the marginal utility becomes negative.

The law of diminishing marginal utility can be explained by the following diagram drawn with the help of schedule.



In the figure, the marginal utility of different glasses of water is measured on Y-axis and the units (glasses of water) of commodity are measured on X-axis. With the help of schedule, the points A, B, C, D, E, F and G are derived by the different combinations of the units of the commodity (glasses of water) and the marginal utility gained by different units of commodity. By joining these points, we get the marginal utility curve, which has downward with negative slope and it intersects the X-axis at the point of 6th unit of the commodity. At this point "F" the marginal utility becomes zero. When the MU curve goes beyond this saturation point, the MU becomes negative. So there is an inverse functional relationship between the units of a commodity and the marginal utility of that commodity.

So that we conclude that when the MU decreases, the TU increases at decreasing rate. When the MU is zero, The TU is maximum and when the MU becomes negative, the TU decreases.

LAW OF EQUI-MARGINAL UTILITY

It is known by various names i.e. law of substitution, law of maximum satisfaction, law of indifference etc.

According to Lipsey

"The household maximizing the utility will so allocate the expenditure between commodities that the utility of the last penny spent on each item is equal".

In other words,

"A consumer spends his income or money on different goods in such a way that the marginal utilities of different goods are equal. In this way, he gets maximum total utility.

Deviating from this law a rational consumer can not get maximum total utility. Therefore, he is bound to spend his limited resources by applying this law to maximize his total utility.

Assumptions:

The assumptions of this law are as below:

1. Rationality

The consumer is rational. He aims at maximization of his total utility and nothing else.

2. Limited income

The money income is given i.e. Y , which a consumer wants to spend on different goods at particular time.

3. Application of law of diminishing MU

It is assumed that the law of diminishing marginal utility is applicable on the commodities consumed by the consumer.

4. Substitution of goods

It is assumed that goods are naturally substitutes of each other. The result of the substitution will be that the MU of one commodity will fall and that of another commodity will rise.

5. Awareness of market.

It is assumed that consumer has much awareness of market.

6. Divisibility

It is assumed that goods which are substitutes of each other are divisible into small units.

Explanation of the law

It is assumed that the given money income Y of the consumer, i.e. Rs. and he wants to purchase good "A" and good "B". In view of the above assumptions the law of equi-marginal utility is explained with the help of the following table:

Units of money	MU of "A" Good	MU of "B" Good
1	10	8
2	8	6
3	6	4
4	4	2
5	2	0
Rs.5	Total utility = 30	TU=20

A rational consumer can spend Rs.5.00 in three ways:

1. Rs.5.00 may be spent on good "A" to get TU=30 unit.
2. Rs.5.00 may be spent on good "B" to get TU=20 units.
3. Some rupees would be spent on the purchase of good "A" and some on the purchase of good "B".

By adopting the third method and obeying the rule of equi-marginal utility, he spends Rs.3.00 on good "A" and

$$MUA = 6 \text{ units}$$

$$TU \text{ gained from good A} = 10+8+6 = 24 \text{ units}$$

Then he spends remaining Rs.2.00 on good "B" and

$$MUB = 6 \text{ units}$$

$$TU \text{ gained from good B} = 8+6 = 14 \text{ units}$$

$$\text{The TU of the consumer} = 24+14 = 38 \text{ units}$$

In this way the TU of the consumer is greater than either TU gained from method 1 or method 2 as mentioned above.

Further, we assume that the consumer does not adopt the law of equi-marginal utility and he spends Rs.4.00 on good "A" and

$$TUA = 10 + 8 + 6 + 4 = 28 \text{ units} \quad MUA = 4 \text{ units}$$

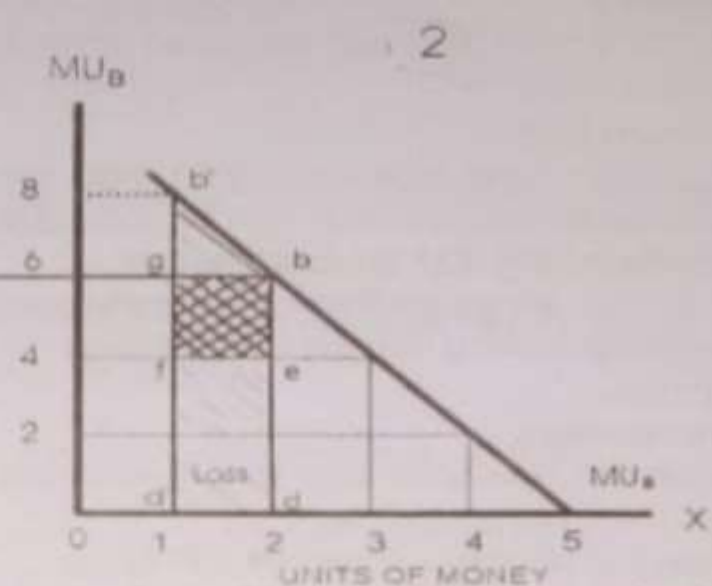
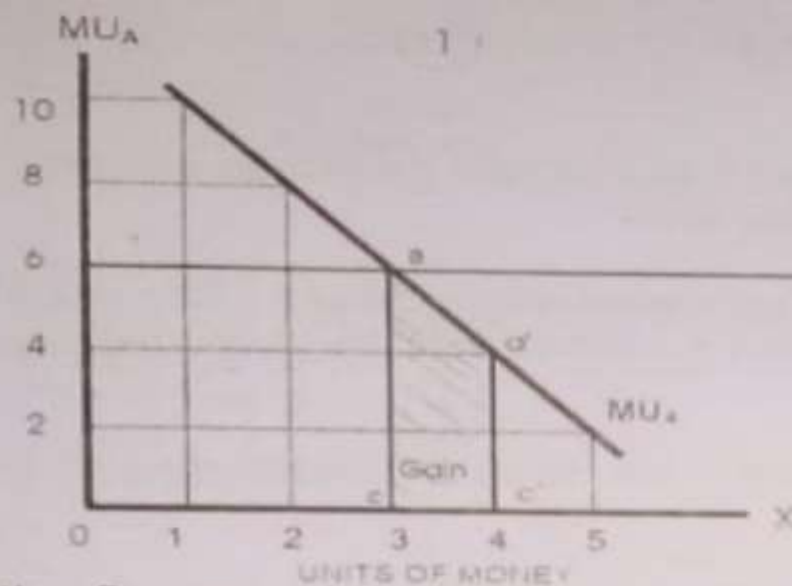
The remaining Rs.1.00 is spent on good "B" then

$$MUB = 8 \text{ units} \quad \text{and} \quad TUB = 8 \text{ units}$$

The marginal utilities of both goods are different. Then

$$TU \text{ of the consumer} = 28+8 = 36 \text{ units}$$

Which is less than the above total utility from his given money spent on different goods to equalize their marginal utilities. The law is explained by the diagram drawn with the help of the above table:



In the figure, units of money are measured on X-axis and marginal utility on Y-axis. With the help of table, the marginal utility curves of good "A" and good "B" are drawn. When the marginal utility derived from the consumption of good "A" and good "B" is equal to 6 units which is shown by the points "a" and "b", the consumer adopts the law of equi-marginal utility and gets maximum TU as shown in diagram (1) and diagram (2) respectively.

Now we assume that consumer spends Rs.4.00 on good 'A' and spends Rs.1.00 on good 'B'. Point 'a' shifts to 'a'' and point 'b' shifts to 'b'' in this way consumer gains total utility equal to (aa'c'c) shaded area in diagram (1) and have a loss of TU equal to (b'bdd') shaded area in diagram (2).

By comparing the loss of TU and gain of TU; the loss is greater than the gain equal to the double shaded area of 'befg'. The consumer is not deriving maximum satisfaction except the combination of expenditure of Rs.3.00 on good "A" and Rs.2.00 on good "B". By so planning of his expenditure that the marginal utility of a rupee spent on one commodity is the same as the marginal utility of a rupee spent on another commodity, he gets maximum satisfaction.