The Law of Equi-Marginal Utility

The law of diminishing marginal utility is applicable only to the want of a single commodity. But in reality, wants are unlimited and these wants are to be satisfied. Hence, to analyze such a situation, the law of diminishing marginal utility is extended and is called "Law of Equi- Marginal Utility". It is also called the "Law of Substitution", "The Law of Consumers Equilibrium", "Gossen Second Law" and "The Law of Maximum Satisfaction".

Definition

Marshall states the law as, "If a person has a thing which he can put to several uses, he will distribute it among these uses in such a way that it has the same marginal utility in all. For, if it had a greater marginal utility in one use than another he would gain by taking away some of it from the second use and applying it to first".

Assumptions

1. The consumer is rational in the sense that he wants to get maximum satisfaction.
2. The utility of each commodity is measurable in cardinal numbers.
3. The marginal utility of money remains constant.
4. The income of the consumer is given.
5. There is perfect competition in the market
6. The prices of the commodities are given.
7. The law of diminishing marginal utility operates.

Explanation

The law can be explained with the help of an example. Suppose a consumer wants to spend his limited income on Apple and Orange. He is said to be in equilibrium, only when he gets maximum satisfaction with his limited income. Therefore, he will be in equilibrium, when,

$$\frac{\text{Marginal utility of Apple}}{\text{Price of Apple}} = \frac{\text{Marginal utility of Orange}}{\text{Price of Orange}} = K$$

$$\text{i.e.,} = \frac{MU_A}{P_A} = \frac{MU_O}{P_O} = K$$

Eg. $^{50}/_{10} = {}^{20}/_{4} = 5$

K- Constant Marginal Utility of Money

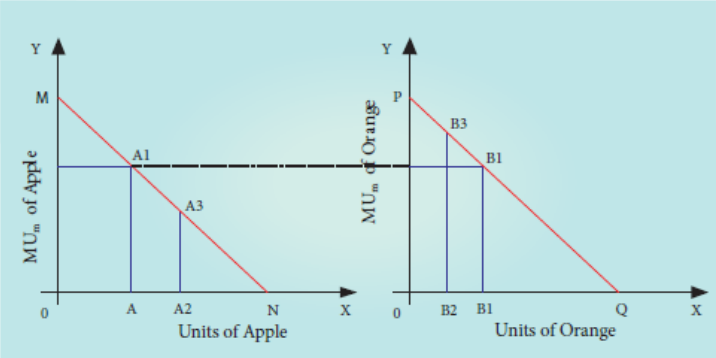
In views of this equilibrium, this Law is also called the "Law of Consumers Equilibrium".

In case $\frac{MU_A}{P_A}$ is less than $\frac{MU_O}{P_O}$

He would transfer the money from Apple to Orange till it is equal. This process of substitution gives him maximum satisfaction both from Apple and Orange. Hence, this Law is also called "Law of

Table 2.2 The Law of Equi-Marginal Utility

Units of Commodities	Apple			Orange		
	Total Utility	Marginal Utility	$\frac{MU_A}{P_A}$	Total Utility	Marginal Utility	$\frac{MU_O}{P_O}$
1.	25	25	25/2 = 12.5	30	30	30/1 = 30
2.	45	20	20/2 = 10	41	11	11/1 = 11
3.	63	18	18/2 = 9	49	8	8/1 = 8
4.	78	15	15/2 = 7.5	54	5	5/1 = 5
5.	88	10	10/2 = 5	58	4	4/1 = 4
6.	92	4	4/2 = 2	61	3	3/1 = 3



Substitution". Eg. For Apple ⁵⁰⁄₂₅; for Orange ²⁰⁄₄. In such situation, spending more money on orange is wiser.

Illustration

This Law can be illustrated with the help of table 2.2. Let us assume that the consumer has a given income of ₹14. He wants to spend this entire income (i.e., ₹14) on Apple and Orange. The price of an Apple is ₹2 and the price of an Orange is ₹1. This law can be illustrated with the help of Table 2.2 If the consumer wants to attain maximum utility, he should buy 5 units of apples and 4 units of oranges, so that he can get (88+54) 142 units.

Here $\frac{MU_A}{P_A} = \frac{MU_o}{P_O}$ ie, $\frac{10}{2} = \frac{5}{1} = 5$

$A_2 A_3$ and $B_2 B_3$ lines have not been used for explanation.

Diagrammatic Illustration

In diagram 2.2, X axis represents the amount of money spent and Y axis represents the marginal utility of Apple and Orange respectively. If the consumer spends ₹10 on Apple and ₹4 on Orange, the marginal utilities of both are equal i.e.,AA1=BB1 (5=5). Hence, he gets maximum utility.

Criticisms

1. In practice, utility cannot be measured, only be felt.

2. This Law cannot be applied to durable goods.

Consumer's Surplus

The concept of consumer surplus was originally introduced by classical economists and later modified by Jevons and Jule Dupuit, the French Engineer Economist in 1844. But a most refined form of the concept of consumer surplus was given by Alfred Marshall. This concept is based on the Law of Diminishing Marginal Utility.

Definition

Alfred Marshall defines consumer's surplus as, "the excess of price which a person would be willing to pay a thing rather than go without the thing, over that which he actually does pay is the economic measure of this surplus satisfaction. This may be called consumer's surplus".

Assumptions

1. Marshall assumed that utility can be measured.

2. The marginal utilities of money of the consumer remain constant.

3. There are no substitutes for the commodity in question.

4. The taste, income and character of the consumer do not change.

5. Utility of one commodity does not depend upon the other commodities.

Explanation

The concept of consumer's surplus can be explained with help of an example. Suppose a consumer wants to buy an apple. He is willing to pay ₹4, rather than go without it and the actual price of the apple is ₹2. Hence the consumer's surplus is ₹2(₹4 – ₹2). Thus, consumer's surplus is the difference between the price that a consumer is willing to pay (potential price) and what he actually pays. Therefore,

Consumer's surplus	=	What a person is willing to pay – What he actually pays.
	OR	
Consumer's surplus	=	Potential price– Actual price.

Mathematically,

Consumer's surplus = TU – (P x Q)

Table 2.3 Consumer's Surplus

Units of commodity (Apple)	*Willingness to pay or Potential Price (Marginal Utility)*	*Actual Price*	*Consumer's Surplus = Potential Price – Actual Price*
1	6	2	6 - 2 = 4
2	5	2	5 - 2 = 3
3	4	2	4 - 2= 2
4	3	2	3 - 2 = 1
5	2	2	2-2=0
Total	20	10	10

where,

TU = Total Utility, P = Price and Q= Quantity of the commodity

The measurement of consumer's surplus is illustrated in Table 2.3. In Table 2.3 the consumer is willing to pay rupees 6, 5, 4, 3 and 2 for purchasing the successive units of apples. Hence, he is willing to pay (Potential Price Total Utility) ₹20 for apples. But, he actually pays ₹10 (₹2 x 5)) for getting 5 apples. Hence,

Consumer's Surplus = Total Utility (Actual Price x units of Commodity)

= TU – (P x Q)

= 20 –(2 x 5)

= 20-10 = 10.

The concept of Consumer's Surplus can also be explained with the help of a diagram.

In the diagram 2.3, X axis shows the amount demanded and Y axis represents the price. DD1

shows the utility which the consumer derives from the purchase of different amounts of commodity. When price is OP, the amount demanded is OQ.

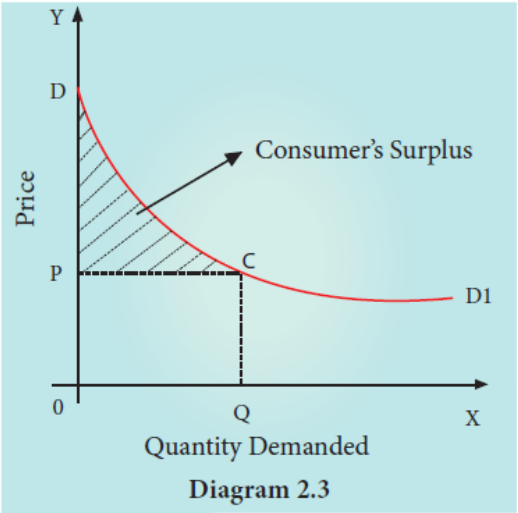


Diagram 2.3

Hence, actual price is OPCQ (OP x OQ).
Potential Price (Total Utility) is ODCQ.

Therefore,

Consumer' Surplus = ODCQ – OPCQ
= 20-10 = 10
= PDC (the shaded area)

Criticism

1. Utility cannot be measured, because utility is subjective.
2. Marginal utility of money does not remain constant.
3. Potential price is internal, it might be known to the consumer himself.