Indifference Curve Analysis

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Indifference Curve Analysis

- The utility is a psychological phenomenon; that implies the satisfying power of a good or service. It differs from person to person, as it depends on a person's mental attitude.
- The two principal theories for the utility are cardinal utility and ordinal utility.
- **Cardinal utility** concept: utility is measured quantitatively
- **Ordinal utility** concept: expresses the utility of a commodity in terms of 'less than' or 'more than'.
- Ordinal Utility is propounded by the modern economists, J.R. Hicks, and R.G.D. Allen, which states that it is not possible for consumers to express the satisfaction derived from a commodity in absolute or numerical terms. However, a person can introspectively express whether a good or service provides more, less or equal satisfaction when compared to one another.
- In this way, the measurement of utility is ordinal, i.e. qualitative, based on the **ranking of preferences** for commodities. **For example**: Suppose a person prefers tea to coffee and coffee to milk. Hence, he or she can tell subjectively, his/her preferences, i.e. tea > coffee > milk.

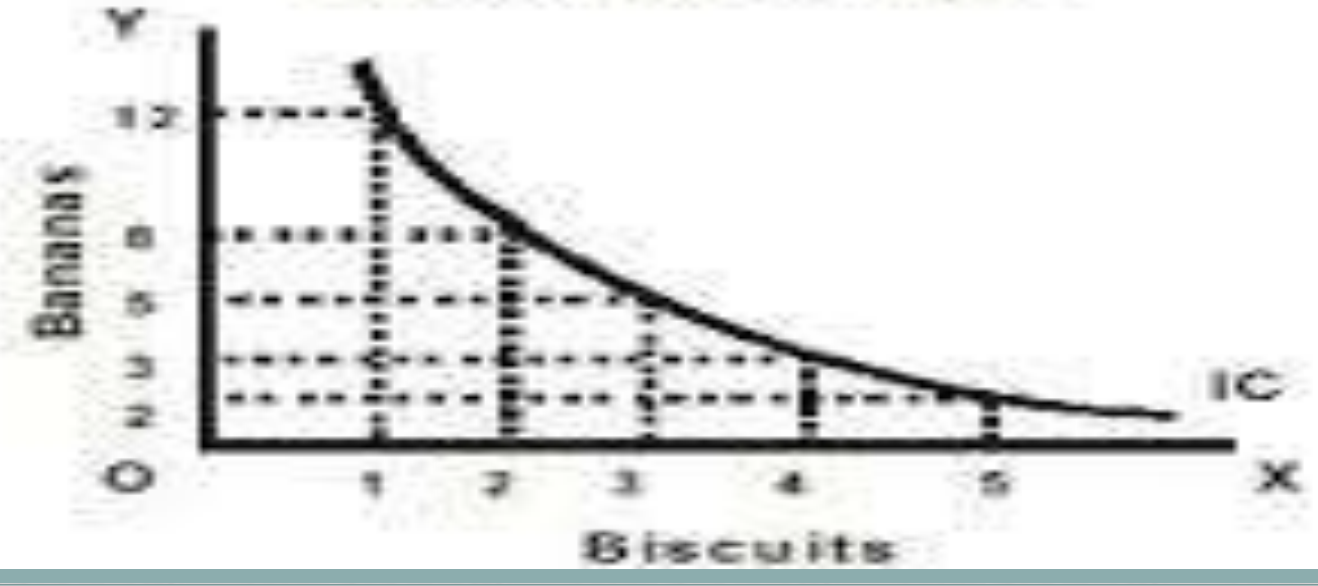
Indifference Schedule and Indifference Curve

- Indifference Schedule: list of various combinations of two commodities which yield the same level of satisfaction to the consumer.
- Indifference Curve: graphical representation of indifference schedule
- It is a locus of all combinations of two goods which yield the same level of satisfaction (utility) to the consumers.
- Since all the combinations give the same amount of satisfaction, the consumer prefers them equally
- Also known as ‘equal satisfaction curve’ or ‘iso-utility curve’.

Table Indifference Schedule

Combination (Good X)	Biscuits (Good Y)	Bananas
A	1	12
B	2	8
C	3	5
D	4	3
E	5	2

Indifference Curve



Indifference Map

An Indifference Map is a set of Indifference Curves

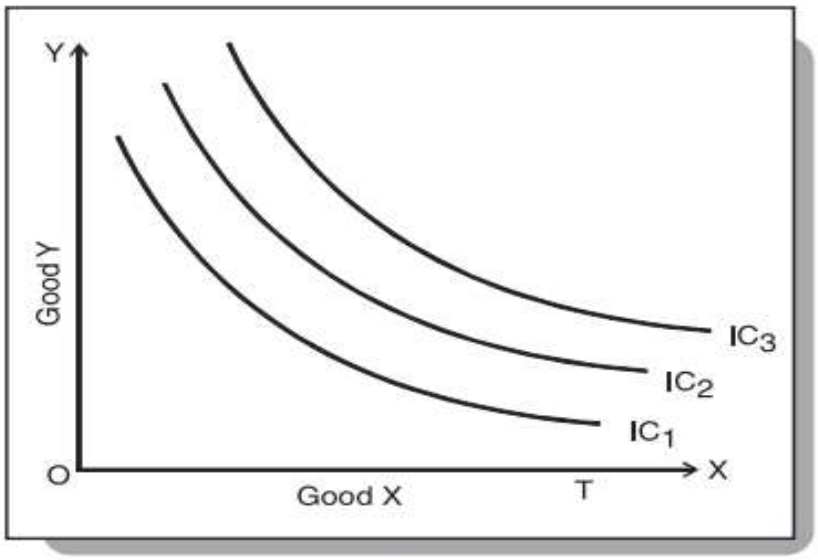


Fig. 2 : Indifference Map

•It is important to note that he prefers the combinations on the higher indifference curves to those on the lower ones.

•This is because a higher indifference curve implies a higher level of satisfaction.

•Therefore, all combinations on IC1 offer the same satisfaction, but all combinations on IC2 give greater satisfaction than those on IC1.

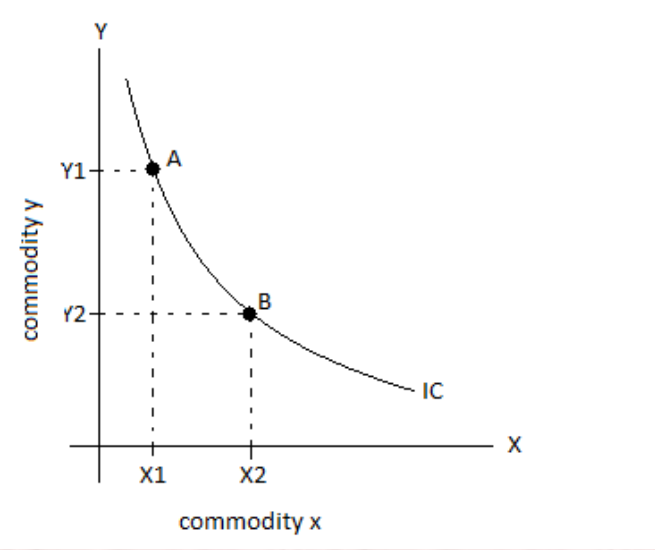
Assumptions of Indifference Curve Analysis

- **Two commodities**: It is assumed that the consumer has fixed amount of money, all of which is to be spent only on two goods. It is also assumed that prices of both the commodities are constant.
- **Non satiety:** Satiety means saturation. And, indifference curve theory assumes that the consumer always tends to move to a higher indifference curve seeking for higher satisfaction.
- **Ordinal utility:** This theory assumes that a consumer can express utility in terms of rank. Consumer can rank his/her preferences on the basis of satisfaction yielded from each combination of goods.
- **Diminishing marginal rate of substitution:** marginal rate of substitution is the rate at which a consumer is ready to give up one good in exchange for another good while maintaining the same level of utility. As indifference curve theory is based on the concept of diminishing marginal rate of substitution, an indifference curve is convex to the origin.
- **Rational consumers:** According to this theory, a consumer always behaves in a rational manner, i.e. a consumer always aims to maximize his total satisfaction or total utility.
- **Transitivity:** E.g. if consumer prefers A combination to B combination and B combination to C combination, then he will definitely prefer A combination to C combination.

Properties of indifference curve

- **Indifference curve slope downwards to right**

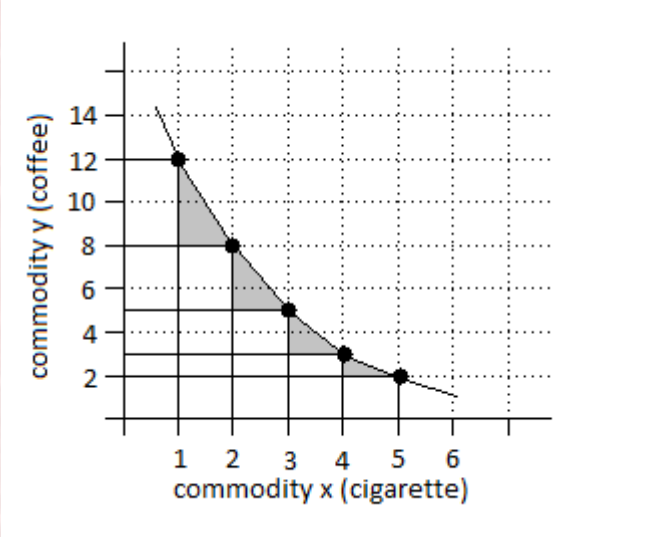
  The indifference curves must slope downward from left to right. As the consumer increases the consumption of X commodity, he has to give up certain units of Y commodity in order to maintain the same level of satisfaction.



In the above diagram, IC is an indifference curve, and A and B are two points which represent combination of goods yielding same level of satisfaction.

- **Indifference curve is convex to the origin**

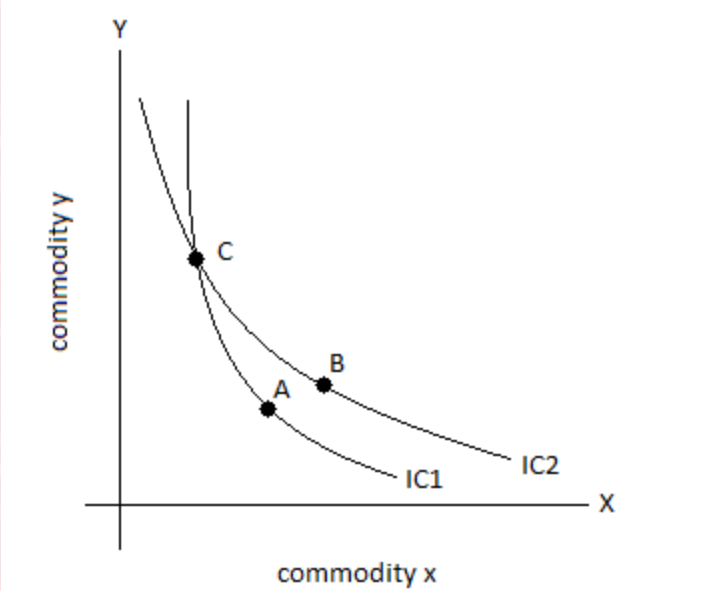
  The Slope of the curve is referred as the Marginal Rate of Substitution. As the consumer substitutes commodity X for commodity Y, the marginal rate of substitution diminishes . Thus, indifference curve is always convex (neither concave nor straight).



- If the indifference curve is concave, MRSxy increases. It violets the fundamental feature of consumer behaviour.
- If commodities are almost perfect substitutes then MRSxy remains constant. In such cases the indifference curve is a straight line at an angle of 45 degree with either axis.
- If two commodities are perfect complements, the indifference curve will have a right angle.
- In reality, commodities are not perfect substitutes or perfect complements to each other. Therefore MRSxy usually diminishes.

- **Indifference curve cannot intersect each other**

Each indifference curve is a representation of particular level of satisfaction. The level of satisfaction of consumer for any given combination of two commodities is same for a consumer throughout the curve. Thus, indifference curves cannot intersect each other.



In the above image, IC1 and IC2 are two indifference curves and C is the point where both the curves intersect. According to indifference curve theory, satisfaction at point C = satisfaction at point A

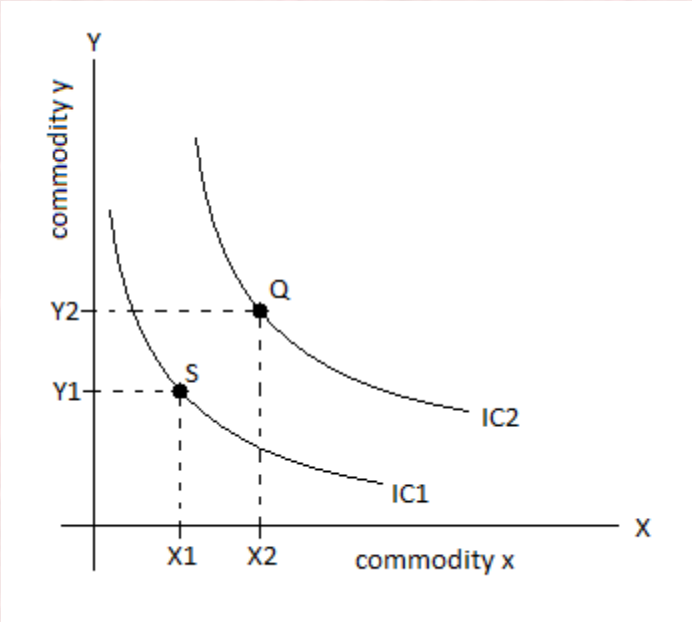
Also, satisfaction at point C = satisfaction at point B

But, satisfaction at point B ≠ satisfaction at point A.

Therefore, two indifference curves cannot intersect. Yet, two indifference curves need not be parallel to each other.

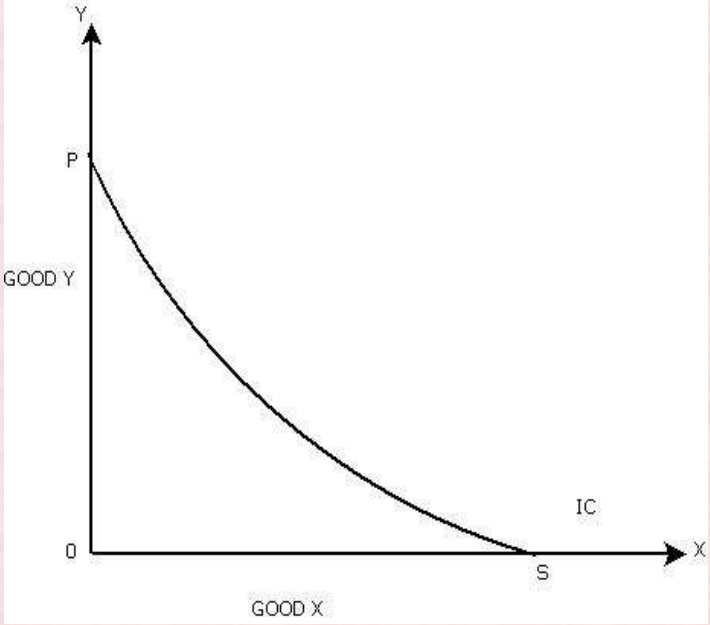
- **Higher indifference curve represents higher level of satisfaction**

  Higher the indifference curves, higher will be the level of satisfaction.



In the above figure, IC1 and IC2 are two indifference curves, and IC2 is higher than IC1. We can also see that Q is a point on IC2 and S is a point on IC2.
Combination at point Q contains more of both the goods (X and Y) than that of the combination at point S. We know that total utility of commodity tends to increase with increase in stock of the commodity. Thus, utility at point Q is greater than utility at point S, i.e. satisfaction yielded from higher curve is greater than satisfaction yielded from lower curve.

- **Indifference Curves do not Touch the Horizontal or Vertical Axis:** One of the basic assumptions of indifference curves is that the consumer purchases combinations of different commodities. He is not supposed to purchase only one commodity. In that case indifference curve will touch one axis. This violates the basic assumption of indifference curves.



In the above diagram, it is shown that the in difference IC touches Y axis at point P and X axis at point S. At point C, the consumer purchase only OP commodity of Y good and no commodity of X good, similarly at point S, he buys OS quantity of X good and no amount of Y good. Such indifference curves are against our basic assumption

Budget Line / Price Line

The Budget line shows all different combinations of the two commodities that a consumer can purchase given his money income and price of two commodities.

Slope of Price line = Px/Py

Here; Px= price of apples

Py = price of oranges

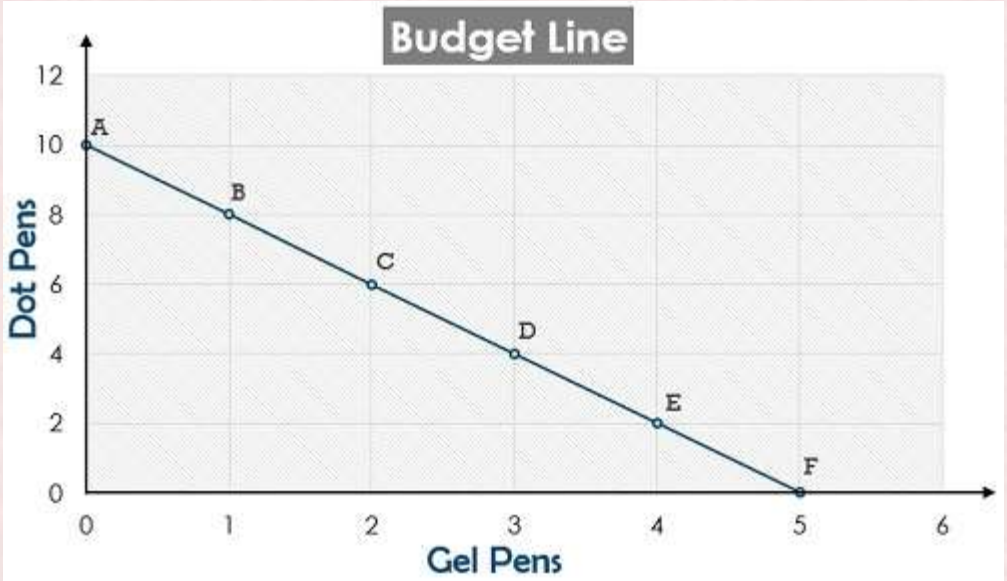
Assumptions of a Budget Line

- **Two Commodities**: It is believed that the consumer will spend all his/her income on purchasing only two goods.
- **Income of the Consumer is Known**: The consumer's income is limited and is known, even the income is wholly allocated for buying only two commodities.
- **Market Price is Known**: The market price of both the goods are known to the consumer.
- **Expenditure is equal to the Income**: We assume that the consumer spends all his/her income

Suppose ; a consumer has: Income = Rs. 50 to be spent on gel pens and dot pens.
Price of gel pen = Rs. 10
Price of dot pen = Rs. 5
the different combinations that a consumer can get of these goods are :

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



Properties of Budget Line

- **Negative Slope**: It slopes downward showing an inverse relationship between the buying of the two goods.
- **Straight Line**: It is a straight line which denotes the constant market rate of exchange at each combination.
- **Real Income Line**: It functions on the principle of income and the spending capacity of a consumer.
- **Tangent to Indifference Curve**: The indifference curve touches the budget line at a point, and this point is known as the consumer's equilibrium.

Consumer Equilibrium

Consumer's equilibrium refers to a situation in which a consumer with given income and given prices purchases such a combination of goods and services which gives him maximum satisfaction and he is not willing to make any change in it. It is struck when "what he is willing to buy coincides with what he can buy"

Assumptions:

- Prices of goods are constant.
- Consumer's income is also constant.
- Consumer knows the prices of all things.
- Consumer can spend his income in small quantities.
- Consumer is rational.
- Consumer is fully aware of Indifference map.
- Perfect competition in the market.

Conditions of consumer equilibrium

1) Price line should be tangent to Indifference Curve.

or

Slope of IC = Slope of Price line

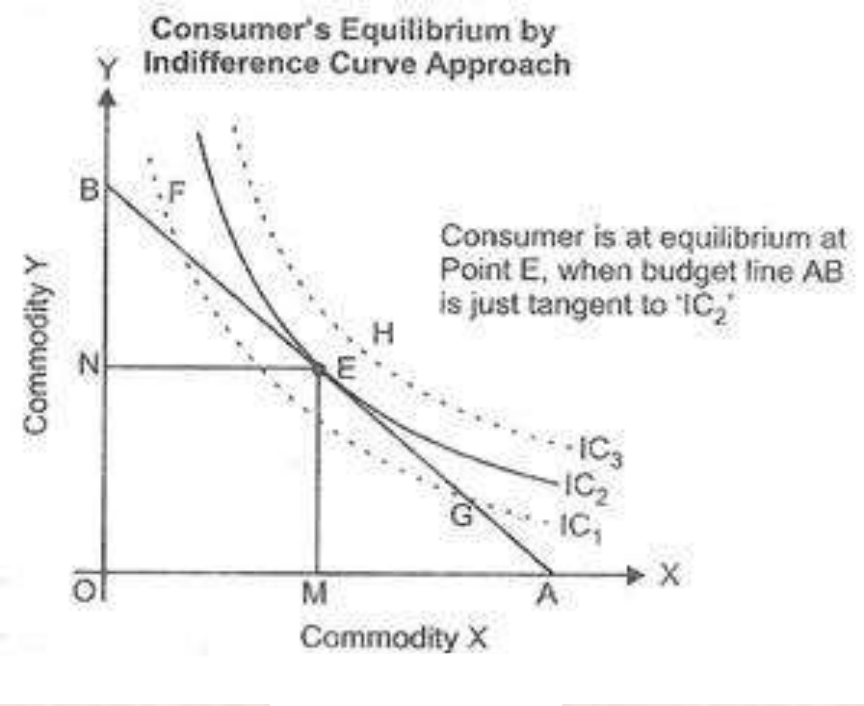
or

MRSxy = Px/Py

a. If $MRS_{XY} > P_X/P_Y$, it means that the consumer is willing to pay more for X than the price prevailing in the market. As a result, the consumer buys more of X. As a result, MRS falls till it becomes equal to the ratio of prices and the equilibrium is established.

b. If $MRS_{XY} < P_X/P_Y$, it means that the consumer is willing to pay less for X than the price prevailing in the market. It induces the consumer to buys less of X and more of Y. As a result, MRS rises till it becomes equal to the ratio of prices and the equilibrium is established.

2) Indifference Curve must be Convex to the Origin.



In Fig. IC_1, IC_2 and IC_3 are the three indifference curves and AB is the budget line. With the constraint of budget line, the highest indifference curve, which a consumer can reach, is IC_2. The budget line is tangent to indifference curve IC_2 at point 'E'. This is the point of consumer equilibrium, where the consumer purchases OM quantity of commodity 'X' and ON quantity of commodity 'Y.

All other points on the budget line to the left or right of point 'E' will lie on lower indifference curves and thus indicate a lower level of satisfaction. As budget line can be tangent to one and only one indifference curve, consumer maximizes his satisfaction at point E, when both the conditions of consumer's equilibrium are satisfied.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