

Laxmi Narain Dubey College, Motihari

(a constituent unit of B.R.A. Bihar University, Muz.)

NAAC Accredited 'B+'

Department of Economics



Topic: Indifference Curve Analysis

Paper-I: MICROECONOMICS

Part-I

B.A. (Hons.)

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Indifference Curve Approach

- Hicks and Allen have analysed the consumer's behaviour through indifference curves.
- An indifference curve depicts the various combinations of two goods, which give the same level of satisfaction or utility to the consumer.

Assumptions of Indifference Curve

- Utility is assumed to be ordinal. Thus, a consumer can rank his preferences but cannot express the utility derived from any good in quantitative terms. He can give his scale of preferences between two goods, x and y, such that
 - He prefers x to y.
 - He prefers y to x.
 - He is indifferent between x and y.
- It is assumed that the consumer is rational. He is assumed to have complete knowledge about the conditions prevailing in the market.
- Given his money income and the prices of the goods x and y, the consumer aims at maximising his total utility.
- The tastes and habits of the consumer remains the same.
- The marginal rate of substitution is diminishing. (*The marginal rate of substitution of good x for good y is the amount of y that the consumer is willing to give up in order to increase his consumption of good x by one unit, while total utility remains the same. The marginal rate of substitution of good x for good y is assumed to decrease as the quantity of good x with the consumer increases.*)
- The preferences of the consumer are assumed to be **transitive**. If he is indifferent between goods **a** and **b** and between goods **b** and **c**, then he is indifferent between goods **a** and **c**. Similarly, if he prefers good **a** to good **b** and good **b** to good **c**, then he prefers good **a** to good **c**.
- As far as his choice of goods and services are concerned, the consumer is assumed to be **consistent**. This implies that if in one period the consumer shows a preference for good **a** as compared with good **b** then he will not prefer good **b** to good **a** in another period.
- The consumer will not be reached to a situation of complete saturation in consuming a good. Hence, he will always prefer more of a good to less of a good.

The Indifference Curve

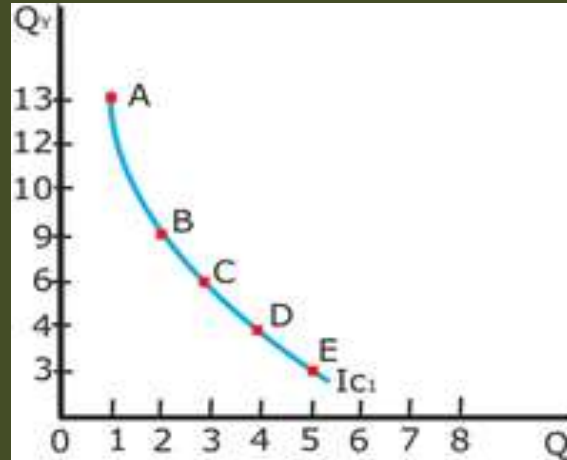
- An indifference curve depicts the various combinations of two goods, which give the same level of satisfaction or utility to the consumer. It is also called an equal utility curve or [iso-utility curve](#).
- The table shows an ***indifference schedule***. A, B, C, D, and E are the different combinations of the quantities of goods x and y, which give the same level of utility to the consumer. The consumer is indifferent between combinations A, B, C, D, and E.

An Indifference Schedule

Combinations of Goods x and y	Good x	Good y
A	1	13
B	2	9
C	3	6
D	4	4
E	5	3

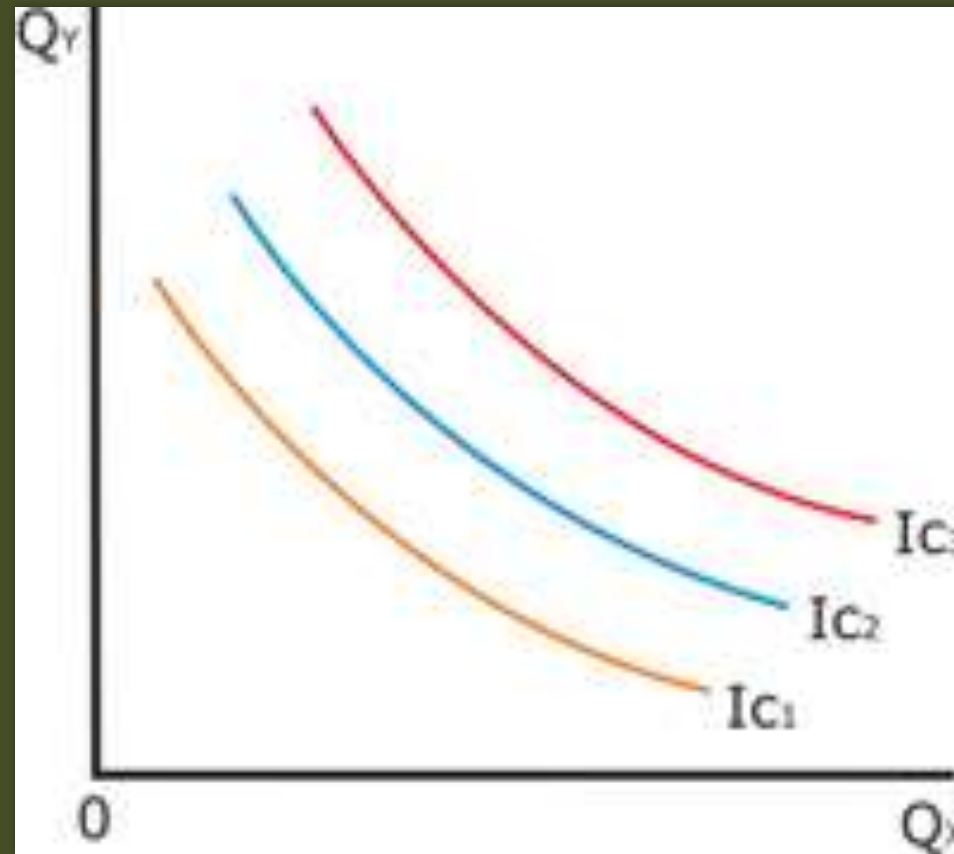
- When the table is plotted graphically, it yields a curve as in the figure. This curve is the indifference curve, IC_1 , along which the combinations A, B, C, D, and E yield the same level of utility to the consumer.

Indifference Curve



- Hence, the consumer is indifferent between these combinations of goods x and y.
- In the second figure, a set of indifference curves represents an **indifference map**.
- A higher indifference curve depicts a larger amount of satisfaction than a lower one because it represents a greater quantity of good x or y or more of both x and y.
- In the figure, all the combinations on indifference curve IC_3 represent the same level of utility and thus are preferred equally. But all combinations on IC_3 are preferred to the combinations on IC_1 and IC_2 , which represent a lower level of utility than IC_3 . Similarly, all combinations on IC_2 are preferred to the combinations on IC_1 , which represent a lower level of utility than IC_2 .

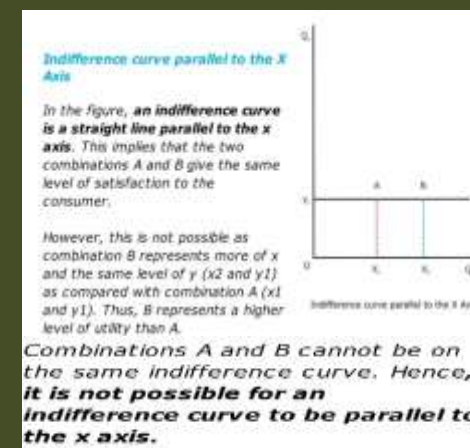
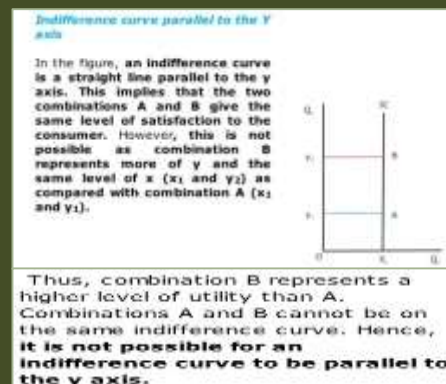
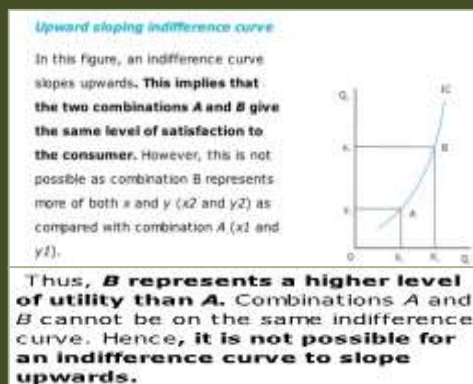
An Indifference Map



Characteristics of an Indifference Curve

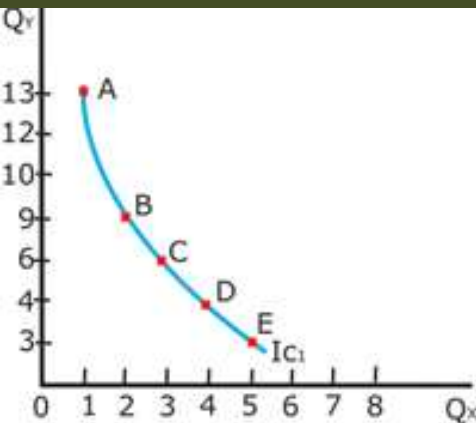
1. An indifference curve is negatively sloped

- This is because if a consumer consumes more of good x , he will have to cut down on his consumption of good y (implying that the two goods can be substituted for each other) if he has to remain on the same indifference curve and his level of utility has to remain the same.
- **Note:** If an indifference curve does not slope downwards, then it can take any other shape.



2. Indifference curve is convex to the origin

- This is because the marginal rate of substitution is diminishing.
- The marginal rate of substitution of good x for good y is the amount of y that the consumer is willing to give up in order to increase his consumption of good x by one unit, while total utility remains the same.
- As the quantity of good x with the consumer increases and that of y decreases, the marginal rate of substitution of good x for good y decreases.
- A consumer is more and more unwilling to part with good y as the quantity of good y with the consumer decreases.

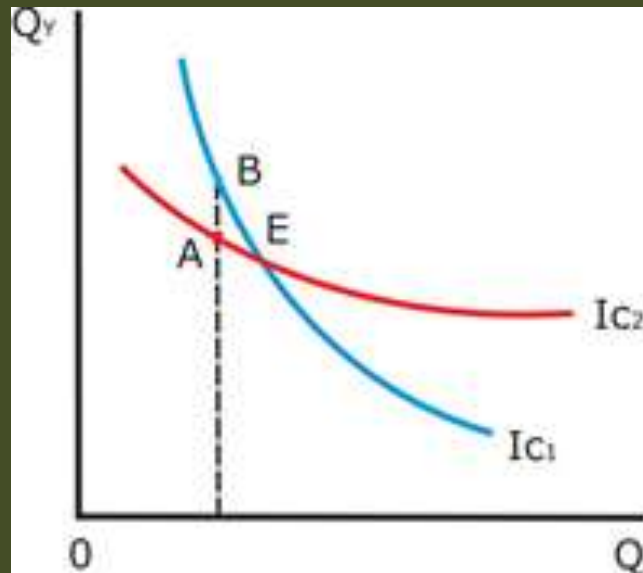


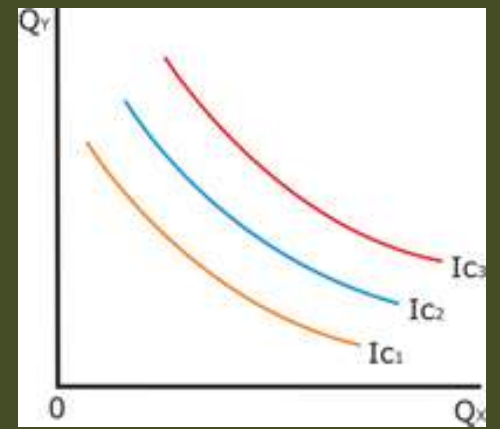
- In the above figure, as the consumer moves down the indifference curve, IC_1 , from combination A(1x, 13y) to B(2x, 9y) to acquire an additional unit of x, he is ready to give up 4 units of y, if he is to remain on the same indifference curve, IC_1 . Thus, to remain at the same level of satisfaction, he has to decrease the consumption of y when he increases his consumption of x. Hence, his marginal rate of substitution of good x for good y, MRS_{xy} , when he moves from A to B, is 4:1.
- As the consumer moves down the indifference curve, IC_1 , from combination B(2x, 9y) to C(3x, 6y) to acquire an additional unit of x, he is ready to give up three units of y. Hence, his MRS_{xy} when he moves from B to C is 3:1.
- Further, as he moves down from combination C(3x, 6y) to D(4x, 4y) to acquire an additional unit of x, he is ready to give up two units of y. Hence, his MRS_{xy} when he moves from C to D is 2:1.
- We have observed that as the consumer moves from A to B to C and so on his MRS_{xy} diminishes.
- It is because of this diminishing MRS_{xy} that the indifference curve is convex to the origin.
- It is important to note that the MRS_{xy} equals the slope of the indifference curve at a point. Thus, it is the slope of the tangent at that point on the indifference curve. It can be written as,

$$MRS_{xy} = \text{Slope of the indifference curve} = \Delta y / \Delta x$$

3. Indifference curves cannot intersect

- The following figure depicts two indifference curves IC_1 and IC_2 , which intersect at point E.
- Since combinations B and E lie on the same indifference curve IC_1 , the consumer would be indifferent between the two combinations.
- Similarly, since combinations A and E lie on the same indifference curves IC_2 , the consumer would be indifferent between the two combinations.
- But given the assumption of **transitivity**, the consumer would then be indifferent between combinations A and B.
- But combination B represents more of good y and the same amount of good x.
- Hence, a consumer will certainly prefer combination B to A.
- Since the result is contradictory, it is obvious that indifference curves cannot intersect.





4. Higher Indifference Curves represent more satisfaction

- In the above diagram IC_2 is higher than IC_1 . Point B on IC_2 represents more units of good x and y than point A on IC_1 curve. Hence point B on IC_2 will give more satisfaction than point A on IC_1 . It is, therefore, that higher the indifference curve, greater the satisfaction it represents.

5. Indifference Curve touches neither x-axis nor y-axis

- In case an indifference curve touches either axis it means that the consumer wants only one commodity and his/her demand for the second commodity is zero.

6. Indifference curves need not be parallel to each other

- Indifference curves may or may not be parallel to each other. It all depends on the marginal rate of substitution. If marginal rate of substitution of different points on two curves diminishes at constant rate, then these curves will be parallel to each other, otherwise they will not be parallel.

7. Indifference curves become complex in case of more than two commodities

- When a consumer desires to have combinations of more than two commodities, say, three commodities, we will have to draw three dimensional indifference curves which are quite complex. If the consumer wants a combination comprising of more than three goods, such a combination cannot be expressed in the form of a diagram. In that case, we will have to take the help of algebra.

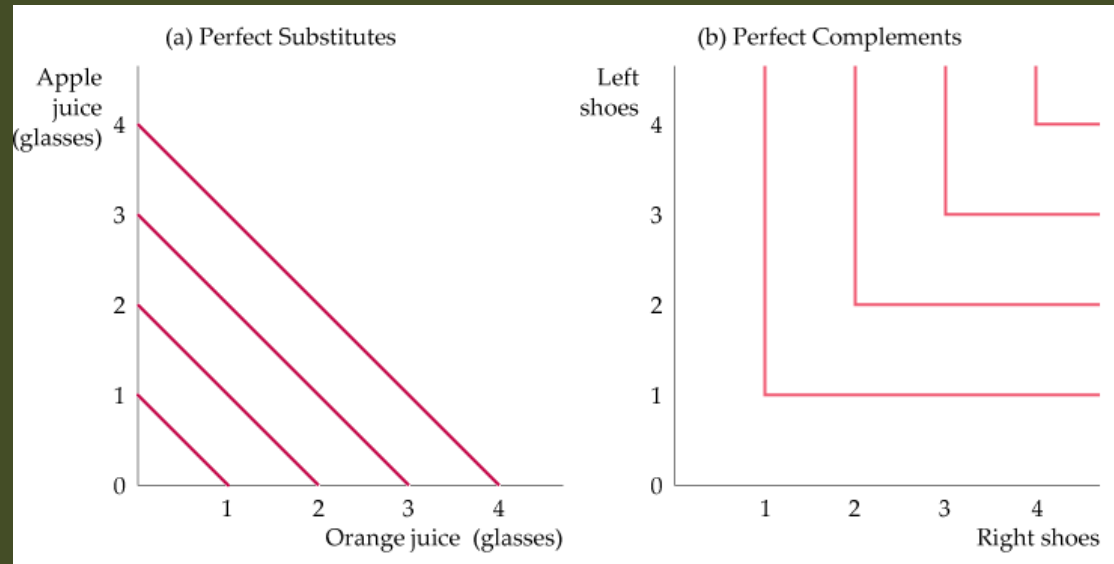
Some Exceptional Shapes of Indifference Curves

1. *Straight Line Indifference Curve* :

If two goods are *perfect substitutes* of each other then their indifference curve may be a straight line with negative slope. It is so because the marginal rate of substitution of such goods remains constant.

2. *Right angled Indifference Curves*:

- Marginal rate of substitution (MRS) of *perfectly complementary* goods is zero.



- In (a), individual A views orange juice and apple juice as perfect substitutes: He is always indifferent between a glass of one and a glass of the other.
- In (b), individual A views left shoes and right shoes as perfect complements: An additional left shoe gives her no extra satisfaction unless she also obtains the matching right shoe.