

Class B.Com-1.

Subject- Business Economics &
Environment.

Paper : 1

Unit : III

Topic : Technical Marginal Rate of
Substitution

Lecture

Sequence No: 3

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Technical Marginal Rate of Substitution

What is meant by marginal rate of technical substitution.

Meaning :-

The marginal rate of technical substitution (MRTS) can be defined as keeping constant the total output how much input 1 have to decrease if input 2 increases by one extra unit. In other

In other words, it shows the relation between and the trade off amongst them without changing the level of total output. When using common inputs such as capital (K) and labour (L) the MRTS can be obtained using the following formula:

$$MRTS_{KL} = \frac{dL}{dK} = \frac{MP_L}{MP_K} \quad \begin{matrix} (K = \text{capital}) \\ (L = \text{labour}) \end{matrix}$$

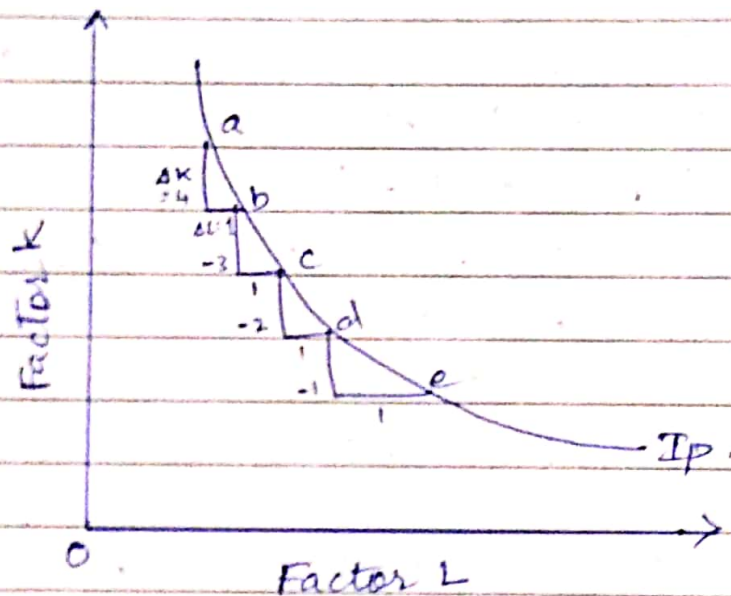
How to calculate the marginal Rate of Technical Substitution MRTS:

The MRTS is the slope of a graph with one factor represented on each other axis. The MRTS slope is an iso-quant or a curve that connects the two input points as long as the output remains the same.

For example, an MRTS graph that has capital (represented with K on its Y axis and labour (represented with L on its X axis) is calculated as dL/dK .

The isoquant shape is dependent upon.

whether input values are exact substitutes which results in a straight line or complements, which creates an L shape when input values are not exact substitutes.



In the fig. shows that when a firm moves down from point (a) to point (b) and it uses one additional unit of labour, the firm gives up 4 units of capital (K) and yet remain on the same isoquant at point (b). So the MRTS is 4. If the firm hires another unit of labour and moves from point (b) to (c) the firm can reduced its capital (K) by 3 units but remains on the same isoquant and the MRTS is 3.

How the MRTS is used:

Producer equilibrium is a concept where all producers strive to generate the maximum amt of profit for the minimum amount of cost. The producer obtains equilibrium by putting together factors of production in a combination that requires the least amount of money. Thus, the producer is responsible for determining the combination of production factors that best achieve this results.

The decision the producer makes involves the MRTS and the principle of substitution. Consider that a producer has only two production factors, factor A and factor B. If factor A can produce a greater amt of output than factor B, with an equal amount of capital being spent on both this would lead to the producer choosing to substitute factor A for factor B.

Difference between Marginal Rate of Substitution and Marginal Rate of Technical Substitution?

	Marginal Rate of Substitution (MRS)	Marginal Rate of Technical Substitution (MRTS)
(*)	MRS at any point of an indifference curve is the negative of the slope	MRTS is the rate at which labour can be substituted for capital.

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of the indifference curve at that point.

by keeping output constant along an isoquant.

(*) It is the rate at which a consumer is willing to trade one good for another to maintain a constant level of utility.

It is the amt by which the quantity of one input has to be reduced when an extra unit of another input is used so that output remains constant.

(*) It is the slope of an Indifference Curve.

It is the slope of an isoquant.

(*) MRS. falls as we move down the indifference curve implying that consumer willingness to give up more units of a good declines as more and more of another good is consumed.

It diminishes as we move down the isoquant curve i.e. as more and more of one input is increased, producer is willing to substitute less and less of other input for any increase in usage of that input.

(*) It focusses on demand side of the consumer theory.

It focusses on prodⁿ side of economic theory.