Dr.Alok Kumar Class-B.A Part-I(Subsi.)

Laws Of Returns

Laws of Returns to Scale: Long-Run Analysis of Production:

In the long run expansion of output may be achieved by varying all factors. In the long run all factors are variable. The laws of returns to scale refer to the effects of scale relationships. In the long run output may be increased by changing all factors by the same proportion, or by different proportions. Traditional theory of production concentrates on the first case, that is, the study of output as all inputs change by the same proportion. The term 'returns to scale' refers to the changes in output as all factors change by the same proportion.

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Suppose we start from an initial level of inputs and output

If X* increases less than proportionally with the increase in the factors, we have decreasing returns to scale.

If X* increases more than proportionally with the increase in the factors, we have increasing returns to scale.

Returns to scale and homogeneity of the production function:

Suppose we increase both factors of the function

$X_0 = f(L, K)$

by the same proportion k, and we observe the resulting new level of output X

$X^* = f\,(kL, kK)$

If k can be factored out (that is, may be taken out of the brackets as a common factor), then the new level of output X* can be expressed as a function of k (to any power v) and the initial level of output

$X^* = K^v f\,(L, K)$

$X^* = k^v X_0$

and the production function is called homogeneous. If k cannot be factored out, the production function is non-homogeneous. Thus A homogeneous function is a function such that if each of the inputs is multiplied by k, then k can be completely factored out of the function. The power v of k is called the degree of homogeneity of the function and is a measure of the returns to scale