

CLASS NOTES

Class: **XI**

Topic: Law of variable proportions

Subject: **ECONOMICS**

Law of Variable Proportions occupies an important place in economic theory. This law is also known as Law of Proportionality.

Keeping other factors fixed, the law explains the production function with one factor variable. In the short run when output of a commodity is sought to be increased, the law of variable proportions comes into operation.

Therefore, when the number of one factor is increased or decreased, while other factors are constant, the proportion between the factors is altered. For instance, there are two factors of production viz., land and labour.

Land is a fixed factor whereas labour is a variable factor. Now, suppose we have a land measuring 5 hectares. We grow wheat on it with the help of variable factor i.e., labour.

Accordingly, the proportion between land and labour will be 1: 5. If the number of labours is increased to 2, the new proportion between labour and land will be 2: 5. Due to change in the proportion of factors there will also emerge a change in total output at different rates. This tendency in the theory of production called the Law of Variable Proportion

Assumptions:

Law of variable proportions is based on following assumptions:

(i) Constant Technology:

The state of technology is assumed to be given and constant. If there is an improvement in technology the production function will move upward.

(ii) Factor Proportions are Variable:

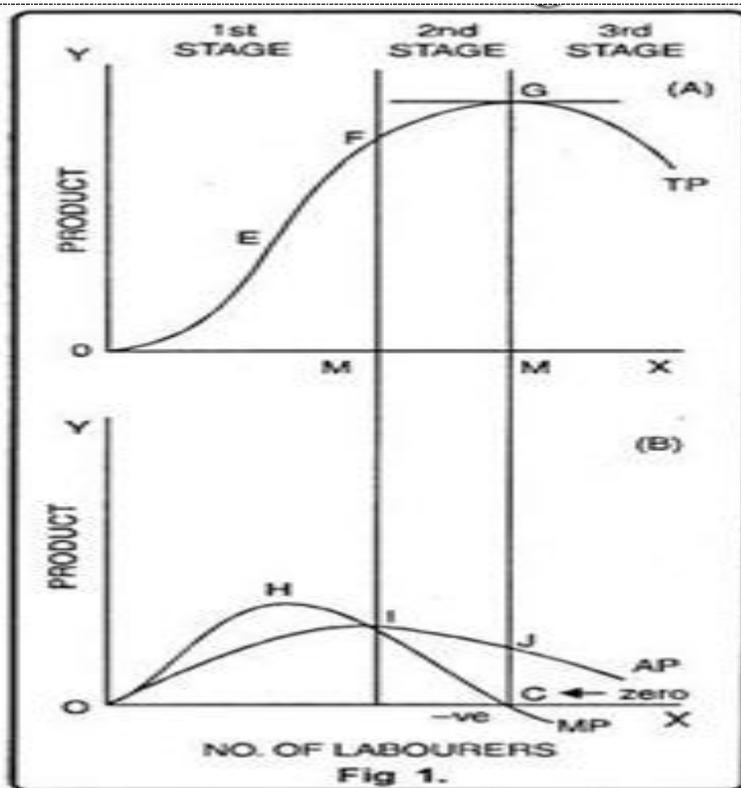
The law assumes that factor proportions are variable. If factors of production are to be combined in a fixed proportion, the law has no validity.

(iii) Homogeneous Factor Units:

The units of variable factor are homogeneous. Each unit is identical in quality and amount with every other unit.

(iv) Short-Run:

The law operates in the short-run when it is not possible to vary all factor inputs.



Three Stages of the Law:

1. First Stage:

First stage starts from point 'O' and ends up to point F. At point F average product is maximum and is equal to marginal product. In this stage, total product increases initially at increasing rate up to point E. between 'E' and 'F' it increases at diminishing rate. Similarly marginal product also increases initially and reaches its maximum at point 'H'. Later on, it begins to diminish and becomes equal to average product at point T. In this stage, marginal product exceeds average product ($MP > AP$).

2. Second Stage:

It begins from the point F. In this stage, total product increases at diminishing rate and is at its maximum at point 'G' correspondingly marginal product diminishes rapidly and becomes 'zero' at point 'C'. Average product is maximum at point 'I' and thereafter it begins to decrease. In this stage, marginal product is less than average product ($MP < AP$).

3. Third Stage:

This stage begins beyond point 'G'. Here total product starts diminishing. Average product also declines. Marginal product turns negative. Law of diminishing returns

firmly manifests itself. In this stage, no firm will produce anything. This happens

because marginal product of the labour becomes negative. The employer will suffer

losses by employing more units of labourers. However, of the three stages, a firm will like to produce up to any given point in the second stage only.

The Stage of Operation:

Now, an important question is in which stage a rational producer will seek to produce.

A rational producer will never choose to produce in stage 3 where marginal product of the variable factor is negative. Marginal product of the variable factor being negative in stage 3, a producer can always increase his output by reducing the amount of the variable factor.

It is thus clear that a rational producer will never be producing in stage 3. Even if the variable factor is free, the rational producer will stop at the end of the second stage where the marginal product of the variable factor is zero.

At the end of the second stage where the marginal product of the variable factor is zero, the producer will be maximising the total product and will thus be making maximum use of the variable factor. A rational producer will also not choose to produce in stage 1 .

A producer producing in stage 1 means that he will not be making the best use of the fixed factor and further that he will not be utilising fully the opportunities of increasing production by increasing quantity of the variable factor whose average product continues to rise throughout the stage 1. Thus, a rational entrepreneur will not stop in stage 1 but will expand further.

Even if the fixed factor is free (i.e., costs nothing), the rational entrepreneur will stop only at the end of stage 1 where the average product of the variable factor is maximum. At the end of stage 1, the producer they will be making maximum use of the fixed factor.

It is thus clear from above that the rational producer will never be found producing in stage 1 and stage 3. Stage 1 and 3 may, therefore, be called stages of economic absurdity or economic non-sense. The stages 1 and 3 represent non-economic regions in production function.

A rational producer will always seek to produce in stage 2 where both the marginal

product and average product of the variable factor are diminishing. At which particular point in this stage, the producer will decide to produce depends upon the prices of factors. The stage 2 represents the range of rational production decisions.