

Producer Behaviour

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1. **Production Function** : It shows the functional relation between physical inputs and physical output of a good. It can be expressed as $Q = (f_1, f_2, f_3, \dots, f_n)$.

Where Q = Physical output of a good; $f_1, f_2, f_3, \dots, f_n$ = Physical inputs.

2. **Production is creation of utility.**

3. **Types of Production Function:**

There are two types of Production Function.

1. **Short-run Production Function** : In this production function one factor of production is variable and all others are fixed. So, law of return to a factor is applied. It is also called variable proportion type of production function.

It is a time period which is not enough to make change in all inputs. In this level of production can be changed by changing the variable factors.

2. **Long-run Production Function** : In this production function all the factors of production are variable. So, law of returns to scale is applied. It is also called constant proportion type of production function.

It is a time period which is enough to make change in all inputs, all inputs are variable in the long run. In this level of production can be changed by changing all inputs.

4. **Total product or Total physical product** refers to total quantity of a goods and services produced by a firm in a given period of time.
5. **Average production** is the per unit production of variable factor.

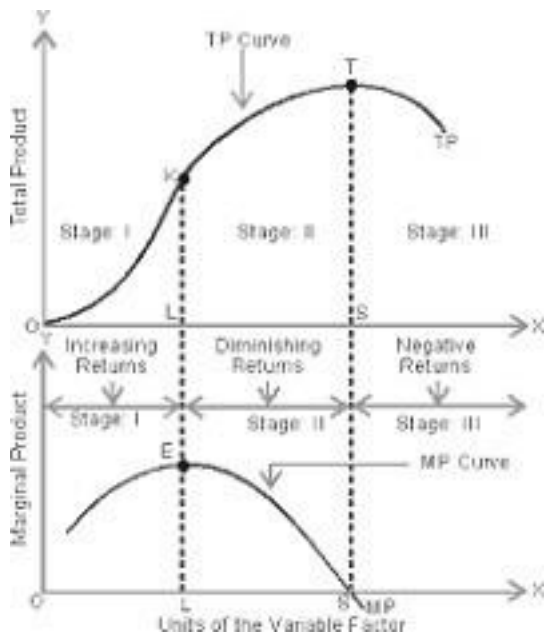
Relation between Total, Average and Marginal Product

1. When TP increases at an increasing rate, MP also increases.
2. When TP increases at a diminishing rate, MP declines.
3. When TP is maximum, $MP=0$.
4. When TP begins to decline, MP becomes negative.

6. **Returns to a factor** : It refers to the behaviour of output when only one variable factor of production is increased in short run and fixed factors

remain constant.

7. **Law of variable proportion :** The law states that when more and more units of variable factors are employed to increase the output, initially output increases at an increasing rate and finally falls.



Stage I (Stage of Increasing Return to factor): TP Increases at increasing rate: In the initial phase as more and more units of variable factors are employed with fixed factor total physical production increases at increasing rate, MP increases.

Cause for increasing return: (a) Underutilization of fixed factor (b)

Indivisibility of factor (c) Increased efficiency of variable factor

Stage II (Stage of Diminishing Return to factor): TP increases at decreasing rate :As more and more units of variable factors are employed with fixed factors then total product increases at diminishing rate, MP decreases but is positive. At the end of this phase TP maximum and MP becomes zero.

Cause of diminishing return: (a) optimal use of fixed factor (b) imperfect factor substitutability

Stage III (Stage of negative return to factor) : TP falls :As more and more units of variable factors are employed with fixed factors, total production starts decreasing and marginal product becomes negative.

Cause of negative return: (a) Poor co-ordination between fixed factor and variable factor. (b) Over utilization of fixed factor