10.1 Meaning of Returns to Scale

Returns to scale refers to the increase in output when all inputs are increased in the same proportion. Hence, to increase production, a firm has to increase all the factors, such as – the factory premises, machinery, labour, capital, organisational capacity, etc. in order to satisfy the long-run demand for a commodity.

When all inputs are changed in the same proportion, we call this as change in scale (or input scale) of production. *The way total output changes due to change in the scale of production (i.e., scale inputs) is known as the 'law of returns to scale'.*

10.2 Types of Returns to Scale

When all the inputs increase in the same proportion, total product may increase at an increasing rate, at a constant rate or at a diminishing rate. Accordingly, there may be three types of returns to scale :

(i) Increasing returns to scale

(ii) Constant returns to scale, and

(iii) Diminishing returns to scale.

10.3 Explanation

The law of returns to scale also has three stages which are shown as under :

Table 5.5 : Production Function : Returns to Scale

	Scale of Inputs		Output Units TP	Returns to Scale MP	
	Units of Labour	Land (in Acres)			
A	2	1	5	5	Increasing
B	4	2	11	6	
C	6	3	18	7	
D	8	4	26	8	Constant
E	10	5	34	8	
F	12	6	42	8	
G	14	7	49	7	Diminishing
H	16	8	55	6	

Three types of returns to scale are shown as under :

- **Increasing Returns to Scale :** The law of increasing returns to scale operates when percentage increase in the total product is more than the percentage increase in all the factor inputs employed in the same proportion. For example, if labour and capital are increased by 100 per cent and the total product increases by 120 per cent, the law of increasing returns to scale operates.

  In table 5.5, from A to D there are increasing returns to scale. For example, in combination A, 2 units of labour and 1 acre of land produce 5 units of output. Compared to A, the combination B has double the amount of each input, but output (equal to 11 units) is more than double of the output at combination A.

  Similarly from B to C, inputs increase by 50% but output increases by more than 50% as 18 is more than 50% higher than 11. Increasing returns to scale occur upto combination D.

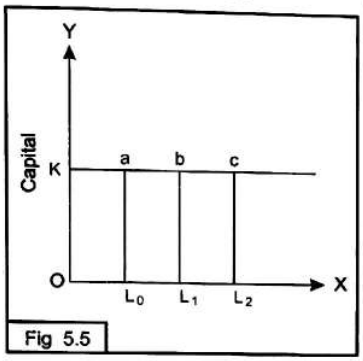
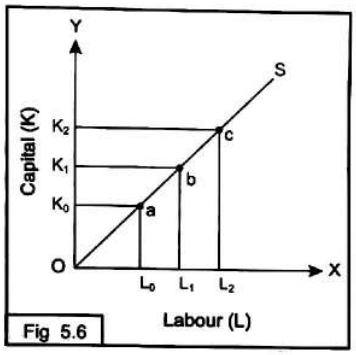
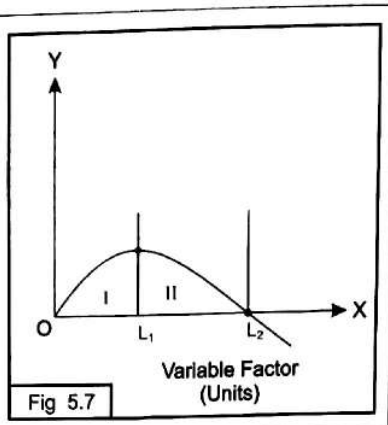
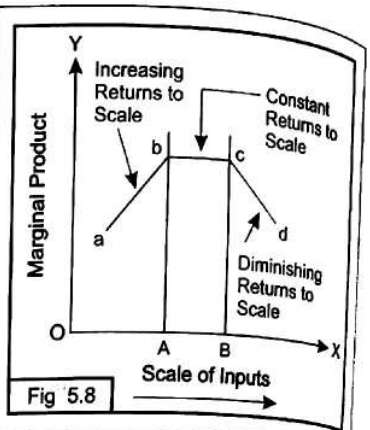
- **Constant Returns to Scale :** The law of constant returns to scale operates when a given percentage increase in all factor inputs in the same proportion causes equal percentage increase in total output. For example, 50 per cent increase in all factor inputs leads to 50 per cent increase in total output, it is called a situation of constant returns to scale.

  Between Combinations D to F, there are constant returns to scale. If the input scale is increased from D to F, marginal returns remain constant. When inputs are increased by the same proportion, the marginal returns from them remain at the same level at 8 units.

- **Diminishing Returns to Scale :** The law of diminishing returns to scale occur when a given percentage increase in all factor inputs in equal proportion causes less than percentage increase in total output. If a 20 per cent increase in all factor inputs causes only 10 per cent increase in total output, it is called a situation of diminishing returns to scale.

  In the third stage (combination E onward), if the scale of inputs increases, then total returns increases only at a diminishing rate.

10.5 Distinction between Returns to Variable Factor and Returns to Scale

Basis	Returns to a Variable Factor	Returns to Scale
1. Meaning	Returns to a factor means the change in output when quantity of one factor is changed, other inputs remaining fixed.	Returns to scale means change in output when quantity of all the factors is increased simultaneously and in the same proportion.
2. Time Period	It is a short run phenomenon.	It is a long run phenomenon.
3. Factor Proportion	Under it, factor proportion goes on changing as more and more units of the variable factor are applied.  Fig 5.5 In the figure, the amount of capital is fixed at OK. As the amount of labour is increased from OL_0 to OL_1 and from OL_1 to OL_2, then the ratio of capital compared to labour goes on decreasing. For example : $\frac{OK}{OL_2} < \frac{OK}{OL_1} < \frac{OK}{OL_0}$	Under it, factor proportion remains unchanged.  Fig 5.6 In the figure, both labour and capital increase in the same ratio along the OS line. So the factor ratio remains constant. That is, $\frac{OK_0}{OL_0} = \frac{OK_1}{OL_1} = \frac{OK_2}{OL_2}$
4. Scale of Production	No change in scale of production.	Scale of production changes.
5. Diagram	 Fig 5.7	 Fig 5.8
6. Cause of Operation	**Phase I** (i) Better utilization of fixed factor. (ii) Division of labour and specialisation.	**Phase I** (i) Indivisibility of some factors. (ii) Division of labour and specialisation.
	Phase II (i) Ideal factor combination is disturbed. (ii) Factors of producing are imperfect substitutes of each other.	**Phase II** (i) Economies of scale become equal to diseconomies of scale.
	Phase III (i) Heavy pressure on fixed factors. (ii) Emergence of managerial problems.	**Phase III** (i) Managerial difficulties. (ii) Fixed supply of fixed factors. (iii) Diseconomies of scale.

Box 5.1 : Economies and Diseconomies of Scales

- **Economies of Scale**

Economies of scale refers to the situation in which on increasing the scale of production, unit cost of production reduces or decreases and output per unit of factor inputs increases. Economies of scale are classified as :

(a) Internal Economies,

(b) External Economies.

Internal Economies are firm specific. They occur with the expansion of firm, i.e., internal economies occur inside the firm. Internal economies are a function of the size of firm. As size of production increases, a firm uses its factors of production more efficiently. Internal economies occur as a result of specialisation and division of labour which decreases long-run average cost.

External Economies of Scale : These economies occur due to expansion of industry. Its benefits are not limited to one or two firm, but to all firms in the industry. These include the following :

(i) Availability of efficient labour at cheap rate.

(ii) Development of transport and communication facility.

(iii) Development of financial institutions, and hence, availability of cheaper credit.

(iv) Easy availability of raw material.

(v) Increase in efficiency of labourers by imparting training.

(vi) Obtaining information related economies by publication of investigation and business magazines.

- **Diseconomies of Scale**

If the production is increased after a certain limit, then economies of scale are converted to 'diseconomies of scale'.

Diseconomies of scale are of two types :

1. Internal Diseconomies,
2. External Diseconomies.

Internal Diseconomies

Internal diseconomies refer to those factors which raise the cost of production of a firm, if its scale of production is increased beyond a point. These include the following :

(i) Management problems

(ii) Technical difficulties

External Diseconomies

External diseconomies are the result of excessive growth of the entire industry of which the individual firms are the members. This may lead to the following problems :

(i) Rise in input prices

(ii) Higher wages

(iii) Costlier transport

2.1 Perfect Competition

Meaning

A perfectly competitive market (popularly known as perfect competition) is defined as a market in which a large number of firms produce and sell similar products. Each individual firm sells the product at the market price. No single buyer or seller can affect the prevailing market price. Therefore, only one price of the commodity prevails in the market.

Features

A perfectly competitive market for a good has the following features :

(1) Very large number of buyers and sellers: There are large number of buyers and sellers of the commodity. The number is so large that none of them can influence the prevailing market price. The word **'large'** number imply that the number of sellers is so large that a single seller's share in total market supply of the product is insignificant. Similarly a single buyer's share in total market demand is negligible.

Implication :

(a) Implication of large number of sellers in the market is that the share of each seller in total market supply is insignificant. Therefore, no single seller can influence the market price by changing his supply. The firm has no option but to sell the product at the price determined by the industry. Therefore, the firm just a price taker.

(b) Similarly the large number of buyers also have the same implication. A single buyer's share in total market demand is also insignificant. No buyer can influence the market price by changing his demand. This makes a single buyer also a price-taker.

(2) Homogeneous/Identical products : All firms sell homogeneous products. Products are identical in all respects like quality, color, size, weight, design etc., in the eyes of their buyers. They are perfect substitutes of one another. Buyers have no preference for a particular seller's product. So purchase of a commodity is a matter of chance instead of choice.

Implication :

(a) The implication of this feature is that all firms have to charge the same price for their products. Any attempt by a firm to sell its product at a higher price will fail. Similarly, buyers are not ready to pay a different price for the product of any firm. Hence, this feature ensures a uniform price for the products of all the firms in the industry (or market).

(b) Firms under perfect competition do not have to spend on advertisement etc. as products are homogeneous.

(3) Freedom of entry and exit : Under perfect competition, there is no restriction on the entry of new firms in the industry or the exit of old firms from the industry which want to leave it. (All firms engaged in the production of a product collectively are called an industry.) There are no artificial (patent rights etc.) and natural (e.g., huge capital requirements, economies of scale) barriers in the way of entry or exit of the firms. This condition must be satisfied especially for long period equilibrium of the industry.

Implication :

This feature ensures that each firm earns just the normal profits in the long run. Normal profits refer to the minimum profits necessary to stay in business. Suppose the existing firms are earning supernormal profits, attracted by the these profits, the new firms will begin to enter the industry. The industry's output, that is, market supply of the good will increase and the price will come down. New firms will continue to enter and hence price will continue to fall till supernormal profits are wiped out. Similarly, if the existing firms are incurring losses, some of the firms will start leaving the industry. The industry's output will decrease and price will start rising. All this continues till losses disappear.

(4) Perfect knowledge of market : The buyers and sellers of products are fully informed about the market. Firms have complete and perfect knowledge about the product market and input market. Buyers also have perfect knowledge about the product market.

Implication :

(a) The implication of perfect knowledge about the product market is that any attempt by any firm to charge a price higher than the prevailing uniform price will fail and also no firm will charge a lower price due to ignorance. Similarly buyers will not pay more due to ignorance.

(b) The implication of perfect knowledge about the input market is that each firm has an equal access to the technology and the inputs used in the technology. No firm has any cost advantage. All the firms have a uniform cost structure. All the firms earn uniform profits.

(5) Perfect mobility : Goods and factors of production are perfectly mobile. This means that factors of production and goods are free to move from the parts of market of lower prices to the parts of market of higher prices.

Implication :

The implication of this feature is that the market supply of the commodity and factors of production is equal in all parts of the market. There cannot exist shortage of the commodity and factors of production in some parts of the market and their abundance in other parts of the market.

Box 10.1 : Why does a single price prevail in Perfect Competition?

In perfect competition, a uniform price of the product prevails throughout the market. The product sells at one single price because of the following reasons :

(i) The product sold by different sellers is homogeneous.

(ii) Both the buyers and the sellers are just price takers.

(iii) Both buyers and sellers have perfect knowledge about the product market. The sellers do not charge a lower price due to ignorance. Similarly, buyers do not pay a higher price due to ignorance.

(6) Absence of transport cost : To ensure uniform price it is assumed that transport costs are zero. Location of different sellers in the market does not affect the price. No seller is close or far off to group of buyers.

Implication : Uniform price of each good and of each factor of production will prevail in the market.