

Laxmi Narain Dubey College, Motihari

(a constituent unit of B.R.A. Bihar University, Muz.)

NAAC Accredited 'B+'

Department of Economics

Topic: Law of Returns to Scale

Paper-I: MICROECONOMICS

Part-I

B.A. (Hons.)

Instructor

Durgesh Mani Tewari

Assistant Professor

dmtewari@gmail.com

THE LAW OF RETURNS TO SCALE

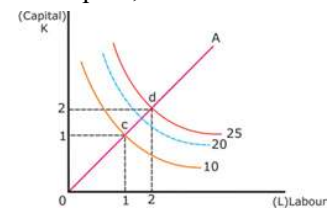
- ✓ We have analysed the law of variable proportions that occurs in the short run and where, to increase production, only one of the factors of production is increased while the others are kept fixed. Hence, there occurs a change in the factor proportions.
- ✓ Let's examine how output changes in the long run, when all the factors of production are variable.
- ✓ Suppose that the firm has two factors of production, capital and labour.
- ✓ The long-run production function can be written as: $X = f(L, K)$
- ✓ There is a change in the scale of operations when all the factors of production change simultaneously in the same proportion. The law that operates in the long run is the law of returns to scale.

STAGES OF LAW OF RETURNS TO SCALE

1. Increasing Returns to Scale

- ✓ Increasing returns to scale occur when all the factors of production are increased simultaneously in the same proportion and there is an increase in the output, which is more than the proportionate.
- ✓ Given is an instance where a firm uses two factors of production, labour and capital, in a ratio of 1:1 to produce a good.

| Labour (Units) | Capital (Units) | Total Product (Units) |
|----------------|-----------------|-----------------------|
| 1 | 1 | 10 |
| 2 | 2 | 25 |



- ✓ The figure shows that one unit of labour and one unit of capital produce 10 units of the good. When there is a doubling of the factor units to two units of labour and two units of capital, respectively, there is an increase in the output to 25 units, which is more than proportionate. This is depicted by a movement from point c to d along the ray OA.

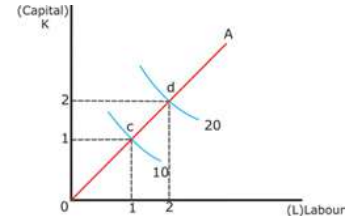
Why do increasing returns to scale occur?

- ✓ A firm experiences increasing returns to scale because of economies of scale.
- ✓ **Economies of scale:** When a firm increases its output by changing its scale of operations, the benefits that it experiences are called economies of scale.
- ✓ Economies of scale include the following:
 - a) **Labour economies:** When production is on a large scale, each worker specialises and is involved in doing the work they are most suited for. Thus, their efficiency increases and there is an increase in production.
 - b) **Technical economies:** These include the following:
 - i. *Economies of superior technology*, where, because of its large size, a firm can purchase bigger and specialised machinery, which may be utilising the latest technology and thus may be cost-reducing.
 - ii. *Economies of linked processes*, where, due to an increase in its size, a firm can go for backward integration (manufacture its inputs) and forward integration (market its product).
 - iii. *Economies in the use of its wastes to manufacture a by-product*.
 - c) **Marketing economies:** A large firm is in a position to buy the raw materials that it needs and the other factors of production at concessional rates because it purchases in bulk. Similarly, as far as selling the product is concerned, it is able to reap the economies of scale in its advertising, sales promotion, and other functions.
 - d) **Financial economies:** Due to its large asset base and credit worthiness in the market, a large firm can raise finance more easily and at cheaper rates than smaller firms.
 - e) **Risk-bearing economies:** Large firms are better equipped to bear risks compared to small firms because they have a diversified portfolio of products and also because they sell their products in a number of markets.

2. Constant Returns to Scale

- ✓ Constant returns to scale occur when all the factors of production are increased simultaneously in the same proportion and there is an increase in the output, which is in the same proportion.
- ✓ The table and the figure here show an example where a firm uses two factors of production, labour and capital, in a ratio of 1:1 to produce a good.
- ✓ The figure shows that one unit of labour and one unit of capital produce 10 units of the good. When there is a doubling of the factor units to two units of labour and two units of capital, there is an increase in the output to 20 units, which is in the same proportion. This is depicted by a movement from point c to point d along the ray OA.

| Labour (Units) | Capital (Units) | Total Product (Units) |
|----------------|-----------------|-----------------------|
| 1 | 1 | 10 |
| 2 | 2 | 20 |



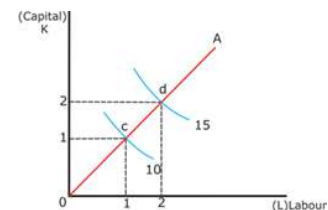
Reasons for constant returns to scale

- ✓ When the economies of scale have reached their limit while diseconomies of scale have not yet appeared, the returns to scale become a constant.
- ✓ This occurs when the firm has exhausted the economies of scale and no further benefits can be derived from it.
- ✓ At the same time, diseconomies of scale are yet to make an appearance and cause a fall in output.

3. Decreasing Returns to Scale

- ✓ Decreasing returns to scale occur when all the factors of production are increased simultaneously in the same proportion and there is an increase in the output, which is less than proportionate.
- ✓ The table and the figure depict an example where a firm, to produce a good, uses two factors of production, labour and capital, in a ratio of 1:1.
- ✓ The figure shows that one unit of labour and one unit of capital produce 10 units of the good. When there is a doubling of the factor units to two units of labour and two units of capital, there is an increase in the output to 15 units, which is less than proportionate. This is shown by a movement from point c to point d along the ray OA.

| Labour (Units) | Capital (Units) | Total Product (Units) |
|----------------|-----------------|-----------------------|
| 1 | 1 | 10 |
| 2 | 2 | 15 |



Reasons for decreasing returns to scale

- ✓ A firm experiences decreasing returns to scale because of diseconomies of scale.
- ✓ **Diseconomies of scale:** When a firm increases its output beyond its optimum capacity by changing its scale of operations, the disadvantages that it experiences are called the diseconomies of scale.
- ✓ They include the following:
 - Managerial diseconomies:** When production is undertaken on a large scale, it becomes difficult for the manager to maintain coordination among the workers and there is also the problem of lack of control.
 - Technical diseconomies:** Technical diseconomies are observed when a firm expands beyond its optimum limit due to increase in its maintenance cost and other costs.
 - Financial diseconomies:** These occur when a firm raises finance beyond an optimum limit.