Cost Analysis

When an entrepreneur decides to produce a commodity, he has to pay the price for inputs which he uses in production. When he employs labour, he pays wages to them and pays money when buys raw materials, fuel and power, rent for the factory building and so on. All these are included in cost of production.

Cost Determinants

The cost of production of goods and services depends on various input factors used by the organization and it differs from firm to firm. The major cost determinants are:

1. **Price of input factors:** A rise in the cost of input factors will increase the total cost of production.
2. **Productivities of factors of production:** When the productivity of the input factors are high then the cost of production will fall.
3. **Size of plant**: The cost of production will be low in large plants due to mass production with mechanization.
4. **Lot size:** Larger the size of production per batch then the cost of production will come down because the organizations enjoy economies of scale.
5. **Laws of returns:** The cost of production will increase if the law of diminishing returns applies in the firm.
6. **Levels of capacity utilization:** Higher the capacity utilization, lower the cost of production
7. **Technology:** When the organization follows advanced technology in their process then the cost of production will be low.
8. **Supply chain and logistics:** Better the logistics and supply chain, lower the cost of production.
9. **Government incentives:** If the government provides incentives on input factors, then the cost of production will be low.

1. ## Opportunity. Cost and Actual Cost:

 Actual cost is all paid out costs of the business firms to take the advantage of the best opportunity available to them. The opportunity cost is the opportunity lost for lack of resources. The opportunity cost may be defined as the returns expected from the second best use of the resources foregone due to the scarcity of resources. The opportunity cost is also called alternative cost. Had the resource available to a person, a firm or a society been unlimited, there would be no opportunity cost.

2. ## Explicit and implicit costs:

Explicit costs are those expenses that involve cash payments. These are the actual or business costs that appear in the books of accounts. These costs include payment of wages and salaries, payment for raw-materials, interest on borrowed capital funds, rent on hired land, Taxes paid etc.

Implicit costs are the costs of the factor units that are owned by the employer himself. These costs are not actually incurred but would have been incurred in the absence of employment of self – owned factors. The two normal implicit costs are depreciation, interest on capital etc. A decision maker must consider implicit costs too to find out appropriate profitability of alternatives.

3. Fixed and variable costs:

Fixed cost is that cost which remains constant for a certain level to output. It is not affected by the changes in the volume of production. But fixed cost per unit decrease, when the production is increased. Fixed cost includes salaries, Rent, Administrative expenses depreciations etc.

Variable is that which varies directly with the variation is output. An increase in total output results in an increase in total variable costs and decrease in total output results in a proportionate decline in the total variables costs. The variable cost per unit will be constant. Ex: Raw materials, labour, direct expenses, etc.

4. Total, average and marginal costs:

Total cost is the total cash payment made for the input needed for production. It may be explicit or implicit. It is the sum total of the fixed and variable costs.

Average cost is the cost per unit of output. If is obtained by dividing the total cost (TC) by the total quantity produced (Q)

$$AC = \frac{TC}{Q}$$

Marginal cost is the additional cost incurred to produce and additional unit of output or it is the cost of the marginal unit produced.

5. Short – run and long – run costs:

Short-run is a period during which the physical capacity of the firm remains fixed. Any increase in output during this period is possible only by using the existing physical capacity more extensively. So short run cost is that which varies with output when the plant and capital equipment in constant.

Long run costs are those, which vary with output when all inputs are variable including plant and capital equipment. Long-run cost analysis helps to take investment decisions.

6. Incremental and Sunk costs:

Incremental cost also known as different cost is the additional cost due to a change in the level or nature of business activity. The change may be caused by adding a new product, adding new machinery, replacing a machine by a better one etc. Sunk costs are those which are not altered by any change – They are the costs incurred in the past. This cost is the result of past decision, and cannot be changed by future decisions. Investments in fixed assets are examples of sunk costs.

Cost Function

A proper understanding of the nature and behaviour of costs is a must for regulation and control of cost of production. The cost of production depends on money forces and an understanding of the functional relationship of cost to various forces will help us to take various decisions. Output is an important factor, which influences the cost.

The cost-output relationship plays an important role in determining the optimum level of production. Knowledge of the cost-output relation helps the manager in cost control, profit prediction, pricing, promotion etc. The relation between cost and its determinants is technically described as the cost function.

$$C= f (S, O, P, T ….)$$

Where;
C= Cost (Unit or total cost)
S= Size of plant/scale of production
O= Output level
P= Prices of inputs
T= Technology

Considering the period, the cost function can be classified as (a) short-run cost function and (b) long-run cost function.

Cost-Output Relation in the short-run:

The cost concepts made use of in the cost behaviour are total cost, Average cost, and marginal cost. Up to a certain level of production total fixed cost i.e., the cost of plant, building, equipment etc, remains fixed. But the total variable cost i.e., the cost of labour, raw materials etc., Vary with the variation in output.

The total of average fixed cost (TFC/Q) keep coming down as the production is increased and average variable cost (TVC/Q) will remain constant at any level of output. In the short-run there will not be any change in total fixed cost. Hence change in total cost implies change in total variable cost only.

Units of Output Q	Total fixed cost	Total variable cost	Total cost (TFC + TVC)	Average variable cost (TVC / Q)	Average fixed cost (TFC / Q)	Average cost (TC/Q)	Marginal cost MC
0	-	-	60	-	-	-	-
1	60	20	80	20	60	80	20
2	60	36	96	18	30	48	16
3	60	48	108	16	20	36	12
4	60	64	124	16	15	31	16
5	60	90	150	18	12	30	26

The above table represents the cost-output relation. The table is prepared on the basis of the law of diminishing marginal returns. The fixed cost Rs. 60 May include rent of factory building, interest on capital, salaries of permanently employed staff, insurance etc. The table shows that fixed cost is same at all levels of output but the average fixed cost, i.e., the fixed cost per unit, falls continuously as the output increases. The expenditure on the variable factors (TVC) is at different rate. If more and more units are produced with a given physical capacity the AVC

will fall initially, as per the table declining up to 3rd unit, and being constant up to 4th unit and then rising. It implies that variable factors produce more efficiently near a firm's optimum capacity than at any other levels of output.

And later rises. But the rise in AC is felt only after the start rising. In the table 'AVC' starts rising from the 5th unit onwards whereas the 'AC' starts rising from the 6th unit only so long as 'AVC' declines 'AC' also will decline. 'AFC' continues to fall with an increase in Output. When the rise in 'AVC' is more than the decline in 'AFC', the total cost again begins to rise. Thus, there will be a stage where the 'AVC', the total cost again begins to rise thus there will be a stage where the 'AVC' may have started rising, yet the 'AC' is still declining because the rise in 'AVC' is less than the droop in 'AFC'.

Thus, the table shows an increasing return or diminishing cost in the first stage and diminishing returns or diminishing cost in the second stage and followed by diminishing returns or increasing cost in the third stage.
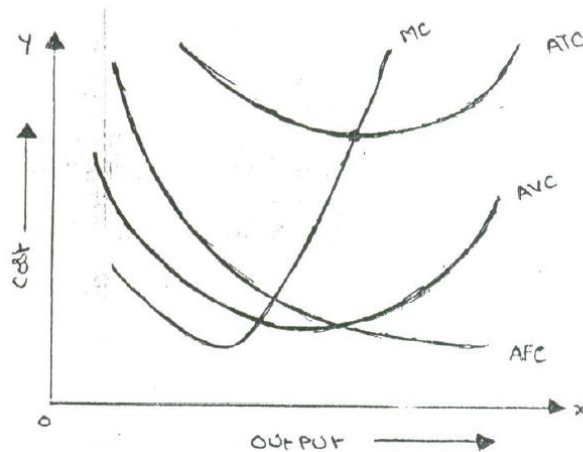
In the above graph the "AFC" curve continues to fall as output rises an account of its spread over more and more units Output. But AVC curve (i.e. variable cost per unit) first falls and than rises due to the operation of the law of variable proportions. The behavior of "ATC" curve depends upon the behavior of 'AVC' curve and 'AFC' curve. In the initial stage of production both 'AVC' and 'AFC' decline and hence 'ATC' also decline. But after a certain

point 'AVC' starts rising. If the rise in variable cost is less than the decline in fixed cost, ATC will still continue to decline otherwise AC begins to rise. Thus the lower end of 'ATC' curve thus turns up and gives it a U-shape. That is why 'ATC' curve are U-shaped. The lowest point in 'ATC' curve indicates the least-cost combination of inputs. Where the total average cost is the minimum and where the "MC' curve intersects 'AC' curve, It is not be the maximum output level rather it is the point where per unit cost of production will be at its lowest.

The relationship between 'AVC', 'AFC' and 'ATC' can be summarized up as follows:

1. If both AFC and 'AVC' fall, 'ATC' will also fall.

2. When 'AFC' falls and 'AVC' rises

a. 'ATC' will fall where the drop in 'AFC' is more than the raise in 'AVC'.

b. 'ATC' remains constant is the drop in 'AFC' = rise in 'AVC'

c. 'ATC' will rise where the drop in 'AFC' is less than the rise in 'AVC'

Cost-Output Relation in the Long-run:

Long run is a period, during which all inputs are variable including the one, which are fixes in the short-run. In the long run a firm can change its output according to its demand. Over a long period, the size of the plant can be changed, unwanted buildings can be sold staff can be increased or reduced. The long run enables the firms to expand and scale of their operation by bringing or purchasing larger quantities of all the inputs. Thus in the long run all factors become variable.

The long-run cost-output relations therefore imply the relationship between the total cost and the total output. In the long-run cost-output relationship is influenced by the law of returns to scale.

In the long run a firm has a number of alternatives in regards to the scale of operations. For each scale of production or plant size, the firm has an appropriate short-run average cost curve. The short-run average cost (SAC) curve applies to only one plant whereas the long-run average cost (LAC) curve takes in to consideration many plants.
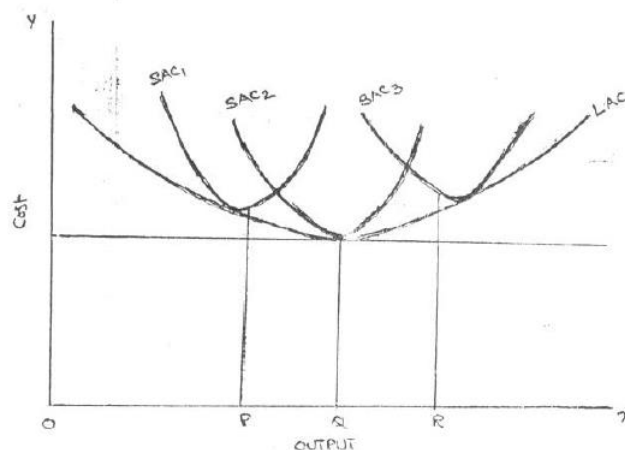
To draw on 'LAC' curve we have to start with a number of 'SAC' curves. In the above figure it is assumed that technologically there are only three sizes of plants – small, medium and large, 'SAC', for the small size, 'SAC2' for the medium size plant and 'SAC3' for the large size plant. If the firm wants to produce 'OP' units of output, it will choose the smallest plant. For an output beyond 'OQ' the firm wills optimum for medium size plant. It does not mean that the OQ production is not possible with small plant. Rather it implies that cost of production will be more with small plant compared to the medium plant.

For an output 'OR' the firm will choose the largest plant as the cost of production will be more with medium plant. Thus, the firm has a series of 'SAC' curves. The 'LCA' curve drawn will be tangential to the entire family of 'SAC' curves i.e. the 'LAC' curve touches each 'SAC' curve at one point, and thus it is known as envelope curve. It is also known as planning curve as it serves as guide to the entrepreneur in his planning to expand the production in future. With the help of 'LAC' the firm determines the size of plant which yields the lowest average cost of producing a given volume of output it anticipates.