CHAPTER - 3

ANALYSIS OF COST AND REVENUE

Nature and Types of Cost:

Cost is the most important factor which influences the supply of commodities. Since highest cost reduces the profits of the producer it is very important factor consider very seriously by the producer. The theory of cost is very important in Economics. Now, the theory has two versions like traditional version and modern version. Here the hub is briefly explained the traditional theory of cost.

Concept of costs:

When a producer wants to produce commodities, he should contribute the factors of production. Then only he can produce the commodity. Further he required to spend many other expenses like taxes, duties etc. So, the cost refers to the expenditure incurred by a firm to produce goods and services.

Types of costs:

On the basis of the nature of the expenditure costs can be classified to many categories. Some of them are described below.

1. **Money Costs / Explicit Costs:**

Simply money costs refers to the total money expenditure incurred by a firm due to its production activities. Wages to labors, salaries to staffs, expenses to purchase raw materials, rent etc. are the examples for money cost. It is also called as explicit costs.

2. **Implicit costs:**

Sometimes the entrepreneur may bring his own raw materials, buildings, land etc. to the business. In reality he can claim rent for land and building, interest on investment etc. Simply, implicit cost refers to the cost on self-owned resources by the producer.

3. **Private And Social Costs:**

Private costs refers to the costs which is related to the firm. This is nothing when we sum up both implicit and explicit costs together we can derive private costs. A social cost is entirely different from private cost. Suppose a factory creates lots of social issues like pollution. So, social cost is nothing, it is the cost incurred in the society.

4. **Opportunity Cost:**

It is defined as the cost of best alternative cost foregone. Consider a field, where a farmer can produce either Rice or Wheat or other crops. When he wants to produce Rice he should sacrifice the others.

5. **Real Cost:**

Payment given to the factors of production in terms of money as well as other extra facilities like logging, fooding, health, education, etc. are called real cost.

6. **Economic Cost:**

The cost obtained after summation of implicit and explicit cost of the factors of production is called economic cost.

7. **Accounting Cost:**

Accounting cost is the measurement of the cost at which we will be recording expense (actual cost incurred/ cash outflow) in our books of accounts for the transaction.

8. **Time and Costs:**

On the basis of time element, costs can be classified in to two. They are

A. **Short Run Period:**

In short run period the producer cannot change the fixed capital or factors of production like land, building etc. he can vary only variable inputs like labor, power, raw material etc.

☑ **Short Run Total Costs And Curves:**

In short run there are three basic concepts of total costs. Namely:

i. **Total Fixed Costs (TFC):**

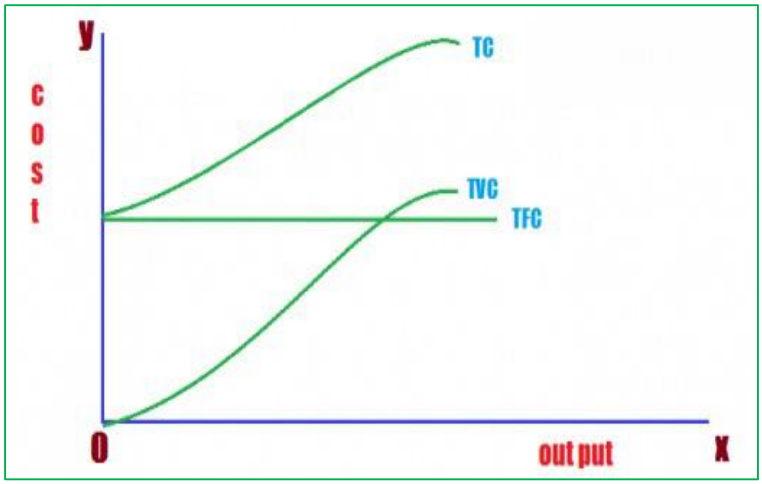
Total fixed costs refer to those costs which are unable to vary. For example: land, buildings, machinery etc. Even the output is zero fixed costs will be there. Because, this cannot be variable with respect to the level of production. So, it is also called invariable cost. Since fixed costs are fixed or rigid it can be represented through a curve having horizontal shape to output axis as showed in the figure below.

ii. **Total Variable Costs (TVC):**

On the opposite of fixed inputs some other variable inputs are there. This can change according to the demand for the production. When the demand is high the producer can increase the output by increasing the variable inputs. TVC curve can be represented as shown in the figure below.

iii. **Total Costs (TC):**

Total cost is the total expenditure incurred by a firm during the production process. To find out total cost, we can add both variable and fixed costs. TC always varies with the TVC. It begin with the minimum point of TFC as shown in the Figure below.



☑ **Short run Average Cost and Curves:**

There are mainly three units of Average Costs. They are

These costs are also known as unit costs. It can be influence the prices and supply of commodities. Any way each of the concepts of Short run Average Costs is briefly shown below with curves.

i. Average Fixed Cost (AFC):

AFC is the average of total fixed costs. AFC can be obtaining by dividing the total fixed cost by total quantity of output each time produced. Mathematically,

- AFC = TFC /quantity

TFC will be always fixed. So it will reduce and never reaches zero. It is showed in the Figure below.

ii. Average Variable Cost (AVC):

AVC is the average of total variable cost. It can be find out by using the following formula.

- AVC = TFC / quantity

AVC curve will be a 'U' shaped one as showed in the figure below**.** Which is showing that when the output is raises the cost will decline, but after a certain level the cost starts to increases. That is why due to the variable proportion.

iii. Average Total Cost (ATC):

ATC or AC is the average of total cost. It can be derived by using the formula

- AC = TC / quantity.

ATC is also a 'U' shaped curve. Because this will varies with the changes in variable costs. The curve of AC can be represented as showing in the figure below.

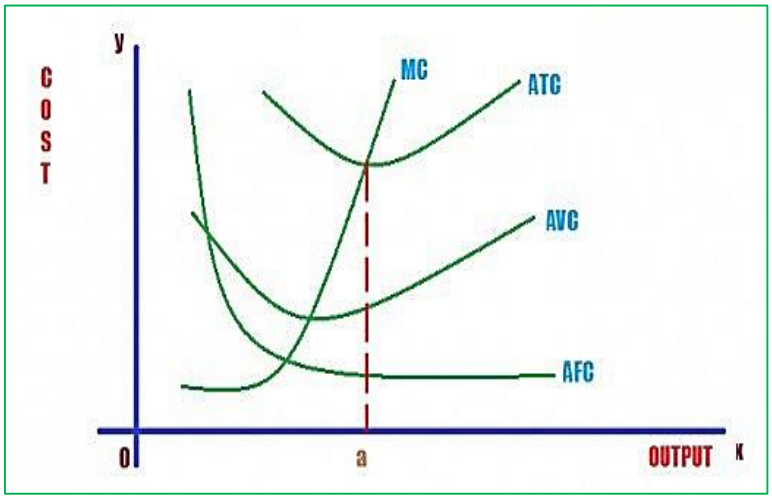
☑ **Short Run Marginal Cost (MC):**

When a producer increases the supply or output of commodities, there arose additional cost. So, Marginal Cost refers to the cost adding to Total Cost when production is increases. Hence MC can be finding by using the formula.

- MC = change in TC / change in quantity

Marginal Cost curve is also a 'U' shaped one. It can be represented as showing in the figure below.

In the figure below short run average costs and MC curves are showed. Where AFC has a shape of rectangular hyperbola. And all other curves have a 'U' shaped curve. An important thing noted that, the relationship between SAC and SMC. Where when SAC decline SMC also follows. When SAC reaches at its minimum point, SMC cut SAC from below through the minimum point of SAC.



B. Long Run Period

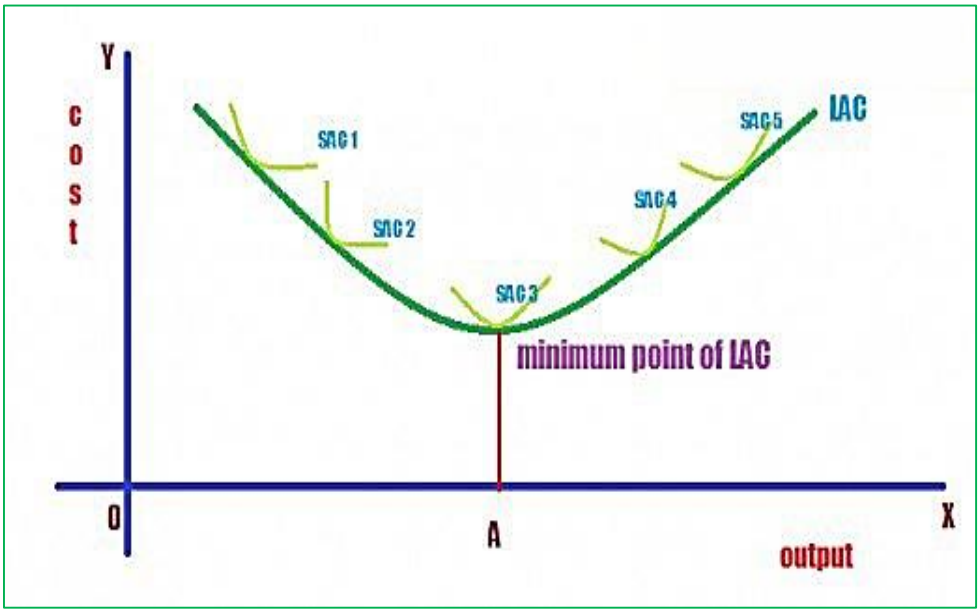
On the opposite side in the long run, the producer can change all inputs both fixed and variable, either increase or decrease according to the demand.

☑ Long Run Cost Curves:

Long run refers to, a firm can vary all inputs even fixed inputs. Mainly two concepts of costs are came under the long run. They are

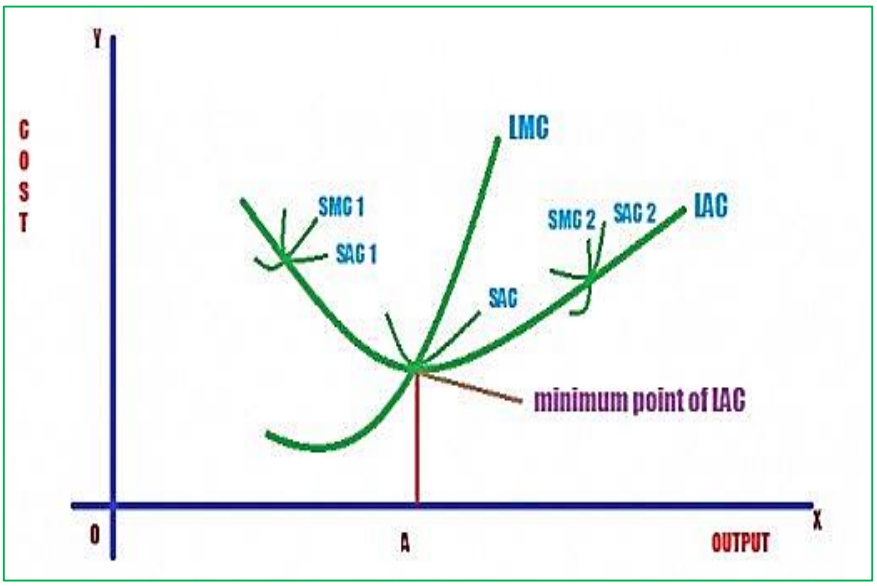
i. Long Run Average Cost (LAC):

LAC is the sum up of each short run average costs (SAC). LAC showing the average cost for producing per unit of output. So, when we add each of the SAC curve we can develop LAC curve. So, this is also called as envelop curve. It is the planning curve because it enables the producer in decision making. The minimum point of LAC curve is more profitable to producer. LAC curve can be represented in the figure below:



ii. Long Run Marginal Cost (LMC):

Since each of the SMC curves passes through the minimum point of SAC, we can draw many SMC curves. But LMC curve will be one which passes through the minimum point of LAC. It is showed in the figure below.



In the above figure, the minimum point of LAC is the point which enables the producer to penetrate maximum profits. LMC curve cuts LAC from below through its minimum point.

Conclusion:

In the traditional theory of cost, all the average cost curves having 'U' shape. In which the producer can earn maximum at a specific point. That is the minimum point of SAC curve in short run and LAC curve in long run.

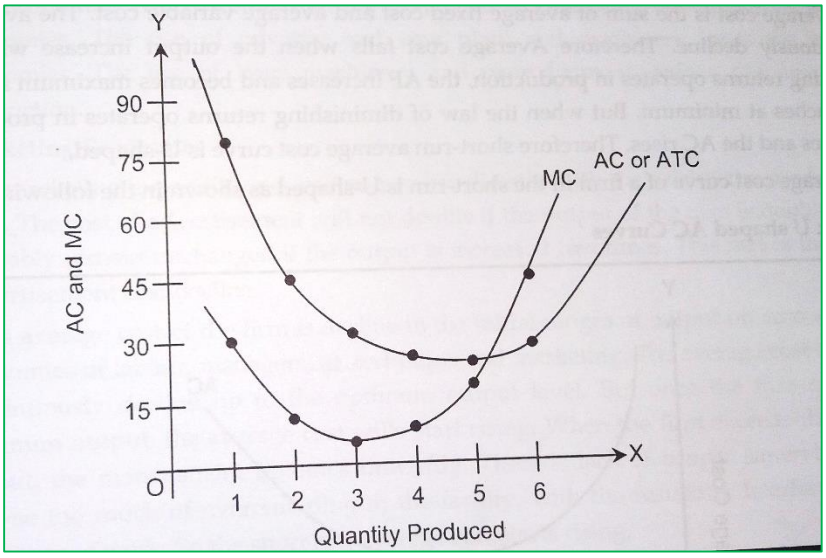
Relation between Average Cost and Marginal Cost Curve:

The relationship between AC and MC is very important for economic analysis. With the help of this relationship, a firm can decide its level of output. Both average and marginal cost first falls reach the minimum point, then after rise. Marginal cost curve cuts average cost curve at its minimum point. When marginal cost is below the average cost, average cost falls and when marginal cost is above than average cost, average cost arise.

The relationship between AC and MC can be explained with the help of following table:

Output (Kg)	TC (Rs)	MC (Rs) = ΔTC/ΔQ	AC (Rs) = TC/Q
0	50	-	-
1	80	30	80
2	90	10	45
3	95	5	31.6
4	105	10	26.2
5	125	20	25
6	170	45	28.3

In the above table, both MC and AC are derived from the total cost. Initially they fall reach at minimum point and start to rise. MC falls faster than AC, reach minimum and MC rise faster than AC. It can be also explained with the help of diagram.



In above figure, before the minimum point of AC curve, the MC curve falls faster than AC curve. The MC curve lies below the AC curve, the MC curve cuts the AC curve from below. After the minimum point of AC curve, MC curve rises faster than AC curve and MC curve lies above the AC curve.

Nature and Type of Revenue Curve:

Revenue is an amount received by producer, seller or firm by selling goods and services in the market at market price.

Concept of Revenue:

1. **Total Revenue:**

Total Revenue is refers, to the total amount received by producer, seller or firm by selling goods and services in the market at market price at a given period of time. It is found out by multiplying the price per unit of the product with the total number of units of the product sold to the customers. Mathematically, TR = P*Q, where

TR = Total Revenue
P = Price
Q = Quantity Sold

2. **Average Revenue:**

Average Revenue is a per unit revenue of the product. It is obtained by dividing total revenue by output i.e. AR = TR/Q.

3. **Marginal Revenue:**

Marginal Revenue is an additional revenue obtained by selling one extra unit of output in the market at market price. It is obtained by dividing the change in total revenue by change in output i.e. MR = change in TR/change in Q.

Derivation of TR, AR and MR Curve under Different Market Structure:

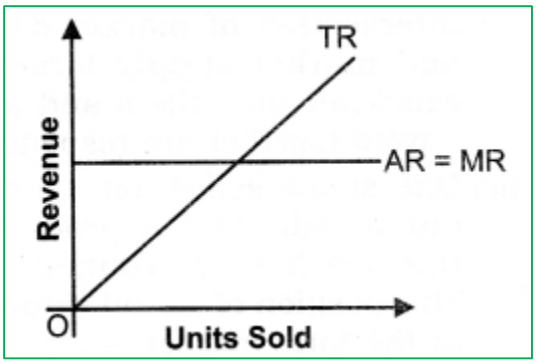
1. Perfect Competition:

Perfect competition refers to a market situation in which there are large numbers of buyers and sellers of the homogeneous product. The price of the product is determined by the interaction between two forces of the market, i.e. demand forces and supply forces. Under perfect competition, a firm is a price taker. Thus, it sells its output at the prevailing market price over a period of time. Thus, the price is constant at each increasing level of output. In other words, the price of the product remains constant at any level of output due to the perfect knowledge about market and product homogeneity. Hence, all firms are price takers.

At the constant price, TR varies positively and proportionately with an output. But, both AR and MR remain constant at any level of output. It is because that TR increases at a constant rate.

Units of Sales (Q)	Price per unit	TR	AR = TR/Q	MR = $\Delta TR/\Delta Q$
1	10	10	10	10
2	10	20	10	10
3	10	30	10	10
4	10	40	10	10

According to the above schedule, when the seller increases his sales as proportionately (say, 1 kg, 2 kg, 3 kg and 4 kg) at a constant price (i.e. Rs. 10) total revenue also increases at the same proportion (say, Rs. 10, Rs.20, and Rs.40). But average and marginal revenues remain constant (say, Rs. 10) at each increasing level of output (sales). In other words, AR = MR at each level of output.



In the above figure, output and revenue are measured on, the X – axis and the Y – axis respectively. TR is the total revenue curve sloping upward, left to right at 45. It indicates that the total revenue varies directly and positively with the sales quantity. AR and MR are average revenue curve and marginal revenue curves respectively. Both curves slope horizontal or parallel to the X–axis. MR coincides with AR. AR is the firm's demand curve and it is perfectly elastic (i.e. ep = ∞). The slope of these curves indicates that both AR and MR remain unchanged at each increasing level of output.

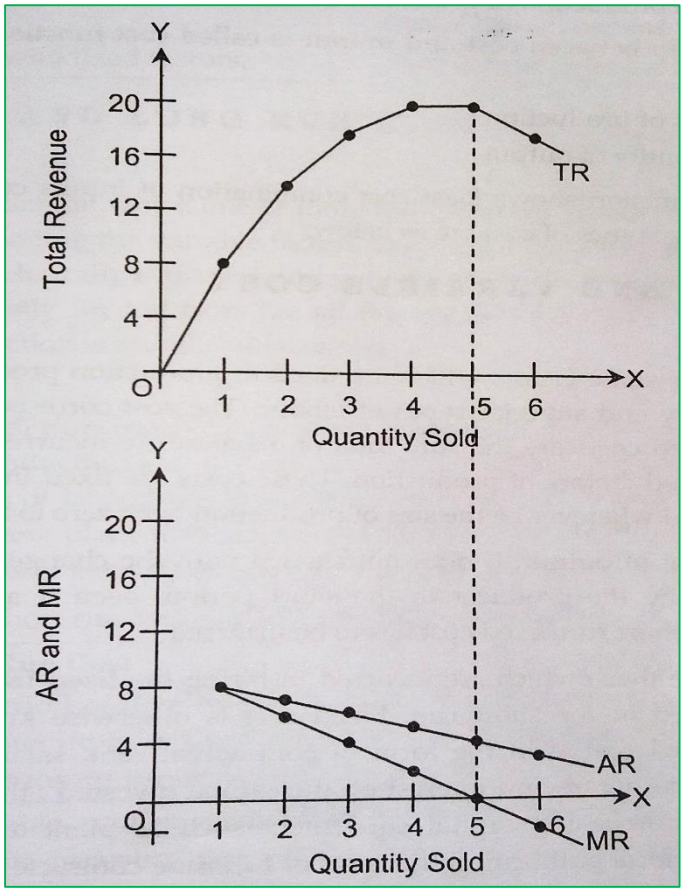
2. Imperfect Competition (Monopoly):

A monopoly is an extreme form of imperfect competition. Monopoly is a market organization in which there is a single seller. There are no close substitutes for the commodity it produces and entry of other firms is blocked. Thus, the seller has full control over the supply of the commodity. A monopolist is a price maker and it is he who determines the price of his product on the basis of the law of demand. Thus, the seller can sell more units of the output only at lower prices.

In other words, there is an inverse relationship between output and price. Hence, total revenue increases at a diminishing rate with an increase in output at the same rate. But, both average and marginal revenue fall continuously. However, the decreasing rate of marginal revenue is greater than average revenue. The relationship between TR, AR, MR can be shown by a schedule as follows:

Price (Rs.)	Units of Commodity(Q)	TR	AR = TR/Q	MR = ΔTR/ΔQ
8	1	8	8	-
7	2	14	7	6
6	3	18	6	4
5	4	20	5	2
4	5	20	4	0
3	6	18	3	-2
2	7	14	2	-4

Above table shows that, under imperfect competition market more units of output can be sold by lowering the price. When price falls, both the average revenue and marginal revenue decline. Marginal revenue decreases at higher rate than average revenue. Marginal revenue falls, becomes zero and it will be negative. Average revenue also falls but remains positive. The total revenue continuously increase, reaches the maximum point and decline. When marginal revenue will be zero, total revenue reaches at the maximum point. But total revenue falls when marginal revenue becomes negative. The derivation of TR, MR and AR curve under Monopoly.



In the upper portion of the figure total revenue is measured on the OY axis and quantity sold is measured on OX axis. In the lower portion of the figure price, average revenue and marginal revenue measured on OY axis quantity sold is measured on OX axis. TR, MR and AR represent the total revenue curve, marginal revenue curve and average curve respectively. The total revenue increase at diminishing rate, reaches the maximum point and declines. Average revenue and marginal revenue curves both slope downward to the right. The sloping rate of marginal revenue is higher than the sloping rate of average revenue.

Under monopoly, the industry itself is the firm, in fact only one firm constitutes the industry. The demand of the monopoly industry is also the demand curve of the monopoly firm. The demand curve will be sloping downwards to indicate that the monopoly firm can sell more only by reducing its price. The MR curve for such a demand curve will also be falling but at a greater rate than demand curve.