Implicit costs of production, on the other hand, are the costs of self-owned and self-employed resources. These costs are normally ignored while calculating the expenses of a producer. These include the rewards for the entrepreneur's self-owned land, labour and capital. These costs do not appear in the accounting records of the firm.

The sum of explicit costs and implicit costs constitutes the total cost of production of a commodity.

Opportunity/Alternative/ Transfer Cost

The concept of opportunity cost is the most important concept in economic theory. In the simplest terms, opportunity cost of a decision may be defined as the cost of next best alternative sacrificed in order to take this decision. In short, the opportunity cost of using resources to produce a good is the value of the best alternative or opportunity forgone. Opportunity costs include both explicit and implicit costs. For example, if with a sum of Rs. 2000, a producer can produce a bicycle or a radio set and decides to produce a radio set. In this case, opportunity cost of a radio set is equal to the cost of a bicycle that he has sacrificed.

Private, External and Social Costs

A cost that is not borne by the firm, but is incurred by others in society is called an external cost. The true cost to the society must include all costs regardless of who bears them. Private costs refer to the costs to a firm in producing a commodity. It is, in fact, the money costs of the firm. For example, the purchase price of a car reflects the private cost experienced by the manufacturer. The air pollution created in the production of the car however, is an external cost. Because the manufacturer does not pay for these costs, and does not include them in the price of the car, they are said to be external to the market pricing mechanism. The air pollution from driving the car is also an externality. The driver does not pay for the environmental damage caused by using the car.

Social cost is the total of all the costs associated with an economic activity. It includes both costs borne by the economic agent and also all costs borne by society at large. It includes the costs reflected in the organization's production function (called private costs) and the costs external to the firm's private costs (called external costs). Thus, it is the cost of producing a commodity to the society as a whole. Hence, the social cost is the sum of private and external cost.

That is,

$$\text{Social Cost} = \text{Private Cost} + \text{External Cost}$$

Or

$$\text{External cost} = \text{social cost} - \text{private cost}$$

If social costs are greater than private costs, then a negative externality is present. Environmental pollution is an example of a social cost that is seldom borne completely by the polluter thereby creating a negative externality. If private costs are greater than social costs, then a positive externality exists. An example is when a supplier of educational services indirectly benefits society as a whole but only received payment for the direct benefit received by the recipient of the education: the benefit to society of an educated populace is a positive externality.

In either case, economists refer to this as market failure because resources will be allocated inefficiently.

Economic Costs

Economic costs are the payments which must be received by resource owners in order to ensure that they will continue to supply them in the process of production. Economic cost includes normal profit.

Short Run Costs and Long Run Costs

Short run is a period of time within which the firm can change its output by changing only the amount of variable factors, such as labour and raw materials etc. In short period, fixed factors such as land, machinery etc, cannot be changed. Costs of production incurred in the short run i.e., on variable factors are called short run costs. The long run costs are the costs over a period in which all factors are changeable. Thus, costs of production on all factors (in the long run all factors become variable) are long run costs.

Fixed/Supplementary and Variable/Prime Costs

The expenses incurred on fixed factors are called fixed costs, whereas those incurred on the variable factors may be called variable costs.

The fixed costs include the costs of:

(a) The salaries and other expenses of administrative staff;

(b) The salaries of staff involved directly in the production, but on a fixed term basis;

(c) The wear and tear of machinery (standard depreciation allowances);

(d) The expenses for maintenance of buildings;

(e) The expenses for the maintenance of the land on which the plant is installed and operates and

(f) Normal profit, which is a lump sum including a percentage return on fixed capital and allowance for risk.

The variable costs include the cost of:

(a) Direct labour, which varies with output.

(b) Raw materials; and

(c) Running expenses of machinery.

The sum of fixed and variable costs constitutes the total cost of production. Symbolically,

$$TC = TFC + TVC$$

Total Fixed Cost (TFC)

Total fixed cost is the sum of expenses incurred on those inputs that remain same at different levels of output. Total fixed cost is graphically shown in Fig. 8.1. It is a straight line parallel to output or x-axis. TFC is the total fixed cost curve parallel to x-axis indicating that it remains constant at all levels of output.

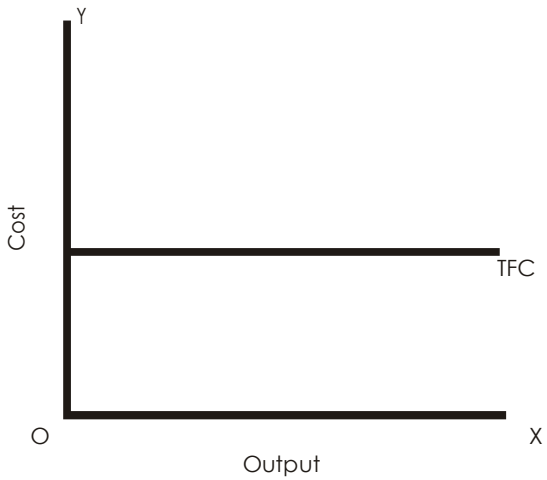

Fig. 8.1

Total Variable Cost (TVC)

Total variable cost is the sum of expenses incurred on those factor inputs whose quantity varies with a change in the level of output. Total variable cost curve TVC is shown in the Fig. 8.2. It has inverse-S shape. Total variable costs increase as the level of output increases.

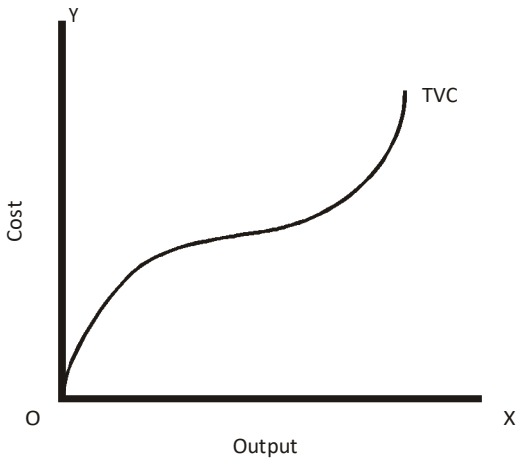

Fig. 8.2

Total Cost (TC)

Total cost to a producer for the various levels of output is the sum of total fixed costs and total variable costs, i.e.,

$$TC = TFC+TVC$$

The adjacent Fig. 8.3 shows total cost of production which is the sum of total variable cost and total fixed cost.

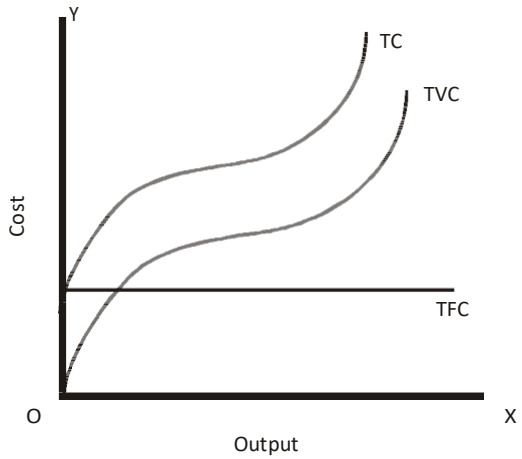

Fig. 8.3

Average Fixed Cost (AFC)

Average fixed cost is total fixed cost divided by total output. It is per unit cost on fixed factors. Symbolically,

$$AFC = \frac{TFC}{TQ}$$

Where, TQ is the total output.

Average fixed cost is shown as under. AFC curve is a rectangular hyperbola, indicating same magnitude at all points as TFC remains constant throughout. This is shown in the Fig. 8.4 below:

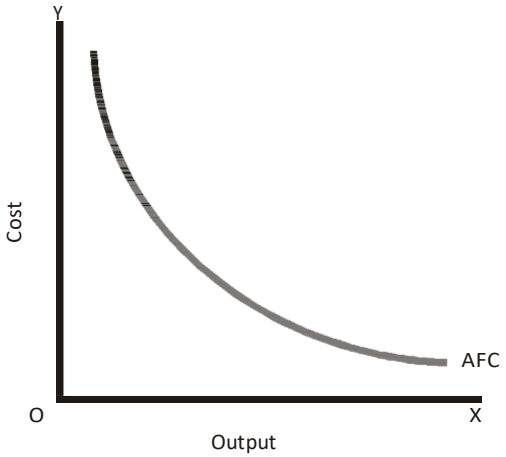

Fig. 8.4

Average Variable Cost (AVC)

The average variable cost is found by dividing the total variable costs by the total units of output, i.e., it is per unit cost of the variable inputs. Symbolically,

$$AVC = \frac{TVC}{TQ}$$

Average variable cost falls initially, reaches a minimum when the plant is operated optimally and rises after the point of normal capacity has been reached. This is shown graphically below in Fig. 8.5.

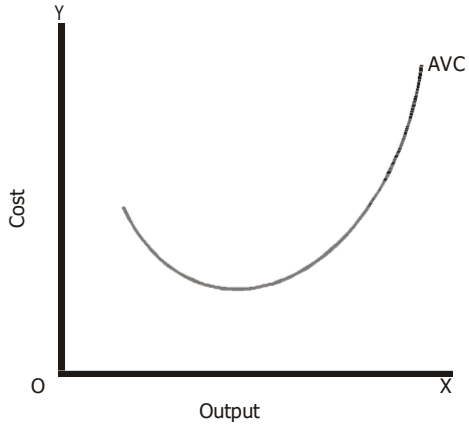

Fig. 8.5

Average Total Cost (ATC/AC)

ATC is the per unit cost of both fixed and variable inputs. Average total cost of production can be obtained by dividing total cost by the units of output, i.e.,

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

or $$= \frac{TFC + TVC}{TQ}$$

or $$= AFC + AVC$$

Average total cost or ATC curve has the similar shape as that of AVC, that is, U-shaped. The figure below shows AC curve.

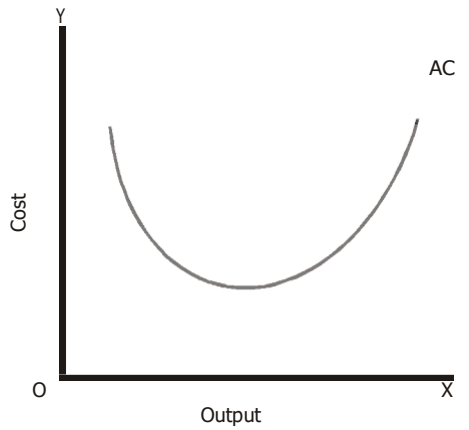

Fig. 8.6

Marginal Cost

Marginal cost is the addition to the total cost as a result of a unit (one unit) increase in the output. It is expressed as:

$$MC_N = TC_N - TC_{N-1}$$

Where, N is the number of units of output. Alternatively, marginal cost can also be expressed as follows:

$$MC = \frac{\Delta TC}{\Delta TQ}$$

Where, ΔTC stands for the change in total cost and ΔTQ for total output.

Graphically, MC curve is the slope of the TC curve, which is shown in Fig. 8.7. MC curve also has U-shaped. It first falls, goes to a minimum and then rises sharply.

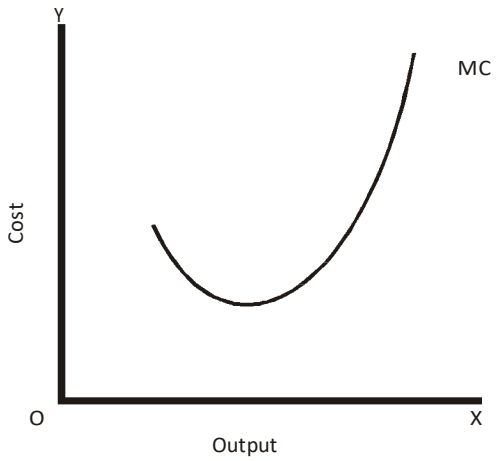

Fig. 8.7

The table below shows the relationship among fixed, variable costs, total, average and marginal costs.

Units of output	*TFC*	*TVC*	*TC*	*AFC*	*AVC*	*AC*	*MC*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
0	10	0	10	-	-	-	-
1	10	4	14	10	4	14	4
2	10	7	17	5	3.5	8.5	3
3	10	9	19	3.3	3	6.3	2
4	10	11	21	2.5	2.7	5.2	2
5	10	14	24	2	2.8	4.8	3
6	10	19	29	1.6	3.1	4.7	5