**THE THEORY OF COSTS**

**Introduction**

The costs of production are very necessary factors to be considered in almost all business decisions especially those relating to the following; locating the weak points in production management, minimizing production costs, finding the optimum level of output and estimating or projecting the costs of business operation. This chapter therefore, covers the various costs incurred in the production process both in the short run and the long run and indicates how they affect decision making by firms.

**The Theory of Costs**

Costs are the expenses that are incurred by the firm during the process of production. Economic theory distinguishes between Short Run (SR) and Long Run Costs (LR).

Short run costs are costs over a period of production when some Factors of Production (FOP) are fixed e.g. capital, and others variable e.g. labor. Hence short-run cost = fixed costs + variable costs

 while;

 Long run costs are the costs over a production period when all factors of production (FOP) are variable.

Costs are categorized into;

**Explicit an implicit costs**

**Explicit costs**

Explicit costs are those which involve cash payments and fall under actual or business costs which are entered in the books of accounts. For example, the payments for wages and salaries, materials, license fee, insurance premium and depreciation charges etc.

**Implicit costs/imputed costs**

Implicit costs may be defined as the earnings expected from resources owned by a firm or business owner in their ­second best alternative use. These costs neither take the form of cash outlays, nor do they appear in the accounting system. For example, suppose an entrepreneur utilizes his services in his own business instead of working as a manager in some other firm on a salary basis, he foregoes this salary as a manager. This loss of salary is the opportunity cost of income from his business. This is an implicit cost of his business. The cost is implicit, because the entrepreneur suffers the loss, but does not charge it as the explicit cost of his own business. Although these costs are not recorded in the firm’s books of account, they form an important consideration in whether or not a factor would remain in its present occupation. The explicit and implicit costs together make the economic cost. Implicit costs can also be thought of as intangible costs that are not easily accounted for. For example, the time and effort that an owner puts into the maintenance of the company, rather than working on expansion, can be viewed as an implicit cost of running the business.

**Economic costs = implicit + explicit costs**

**Accounting costs = explicit costs**

**VARIATION OF COSTS IN THE SHORT -RUN**

In the short run some inputs are fixed while others variable, changes in output result from change in only the variable inputs. Because of this, the relationship between output and costs of production in the short run is mainly explained by the law of diminishing marginal returns.

**Fixed and Variable Costs**

**Fixed costs/supplementary costs/Indirect costs**

Fixed costs are those that do not vary with variations in output. Fixed costs include cost of managerial and administrative staff, depreciation of machinery, building and other fixed assets and maintenance of land, etc. In other words, they are expenditures on the fixed factors of production.

**Illustration: Total fixed cost (TFC)**

**Variable costs/ Prime costs/Direct costs**

Variable costs are those, which vary with the variation in output. Variable costs include cost of raw materials, running cost on fixed capital, such as fuel, repairs, routine maintenance expenditure, direct labor charges associated with the level of output and the costs of all other inputs that vary with changes in output.

**Illustration: Total variable cost (TVC)**

**Total cost (TC)**

Total costs refer to the total amount spent on factors of production used in the production process. They are a sum of total fixed and total variable costs. When output is zero, TC = TFC since TVC will be zero. The shape of the TC curve is determined by that of the TVC curve at every level of output, just because TFC is constant. TC will continue to rise as production increases because there must be some increase in the variable costs as output expands. TC first increases at a decreasing rate, reaches a point where its slope is zero (the point of inflection) and from this point, it starts to rise at an increasing rate. Because of this, the slope of the TC curve, which is the marginal cost (MC) curve, is U-Shaped.

**Illustration: TC, TVC and TFC**

**Total cost, Average fixed cost, Average variable cost and Marginal costs**

Total cost refers to the total expenditure on the resources used to produce a given level of output. In the short- run it includes both fixed and variable costs.

**Average Fixed Costs (AFC)**

The AFC refers to total fixed cost per unit of output produced. It is equal to TFC/Q. The curve for AFC is downward sloping and asymptotic to both axes because at zero output, AFC is undefined. The curve does not cross the output axis because FC cannot be equal to zero. The curve diminishes downwards because fixed costs are not changing yet output is changing.

**Illustration: Average Fixed Costs (AFC) curve**

**Average Variable costs (AVC)**

AVC = TVC / Q

This is total variable cost per unit of output produced. The curve is U-shaped due to the law of diminishing marginal returns, i.e. initially, when more output is produced, per- unit variable cost diminishes output is increasing at an increasing rate (the fixed factors are underutilized by the given variable factor). As more output is produced, per- unit cost will start increasing when the fixed factor is over utilized.

**Illustration: Average Variable costs (AVC) curve**

**Average Cost (AC)**

The Average Cost (AC) of a firm is total cost per unit of output produced. It is obtained by dividing total cost (TC) by total output (Q),

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

AC will initially be high because fixed costs will be spread over a small number of units of output. However, as output increases, AC will start falling as each unit is carrying a small element of fixed cost.

**Illustration: Average Cost (AC) curve**

**Marginal cost (MC)**

Marginal cost is the addition to the total cost resulting from producing an additional unit of the product. Or marginal cost is the cost of a marginal unit produced. Given the cost function, it may be defined as;

$$MC=\frac{∆TC}{∆Q}$$

Illustration: **Marginal cost (MC) curve**

**Relationship between the short run cost curves**

**Schedule**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Q** | **TFC** | **TVC** | **TC** |  **AFC**  |  **AVC**  |  **AC**  | **MC** |
| **0** | **48** | **0** | **48** |  |  |  |  |
| **1** | **48** | **25** | **73** |  |  |  |  |
| **2** | **48** | **46** | **94** |  |  |  |  |
| **3** | **48** | **66** | **114** |  |  |  |  |
| **4** | **48** | **82** | **130** |  |  |  |  |
| **5** | **48** | **100** | **148** |  |  |  |  |
| **6** | **48** | **120** | **168** |  |  |  |  |
| **7** | **48** | **141** | **189** |  |  |  |  |
| **8** | **48** | **168** | **216** |  |  |  |  |
| **9** | **48** | **198** | **246** |  |  |  |  |
| **10** | **48** | **230** | **278** |  |  |  |  |
| **11** | **48** | **272** | **320** |  |  |  |  |
| **12** | **48** | **321** | **369** |  |  |  |  |

**Graphical relationship between short run cost curves (illustration)**

The AC, AVC and MC curves are u-shaped because of the law of diminishing returns.

* The AC lies above the AVC and AFC curves because it is a summation of both the AVC and AFC.
* The AVC gets close to the AC curve but does not touch it due to the existence of fixed costs. The gap between the two curves represents the AFC.
* The MC cuts the AVC before it cuts the AC- i.e., the AC is higher than the AVC
* The MC cuts the AVC and AC curves at their lowest points. WHY?
* AVC reaches its minimum point at a lower level of output than the AC curve. This is because when AVC starts to increase, AC continues to decline because of the substantial decline in the AFC that cannot be outweighed by the increase in AVC until the minimum point of AC.
* When the AVC and AC are declining, the MC is below them and when they are rising, the MC is above them.
* The AFC diminishes continuously with the increase in output and it approaches the output axis asymptotically.
* As long as AFC and AVC fall, AC also falls because AC = AFC + AVC