COST ACCOUNTING

Paper Code- BCH 301

Introduction

Accounting can no longer be considered a mere language of business. The need for maintaining the financial chastity of business operations, ensuring the reliability of recorded experience resulting from these operations and conducting a frank appraisal of such experiences has made accounting a prime activity along with such other activities as marketing, production and finance. Accounting may be broadly classified into two categories – accounting which is meant to serve all parties external to the operating responsibility of the firms and the accounting, which is designed to serve internal parties to take care of the operational needs of the firm. The first category, which is conventionally referred to as "financial accounting", looks to the interest of those who have primarily a financial stake in the organization's affairs – creditors, investors, employees etc. On the other hand, the second category of accounting is primarily concerned with providing information relating to the conduct of the various aspects of a business like cost or profit associated with some portions of business operations to the internal parties viz., management. This category of accounting is divided into "management accounting" and "cost accounting". This section deals with cost accounting.

Cost- Cost is a foregoing, measured in monetary terms, incurred or potentially to be incurred to achieve a specific objective. Cost can be termed as the amount of resources given up in exchange for some goods or services.

Costing- The technique and process of ascertaining costs is known as Costing.

Cost Accountancy- Cost Accountancy includes, Costing and Cost Accounting. Cost Accountancy is the application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control and the ascertainment of profitability.

Meaning of Cost Accounting

Cost accounting developed as an advanced phase of accounting science and is trying to make up the deficiencies of financial accounts. It is essentially a creation of the twentieth century. Cost accounting accounts for the costs of a product, a service or an operation. It is concerned with actual costs incurred and the estimation of future costs. Cost accounting is a conscious and rational procedure used by accountants for accumulating costs and relating such costs to specific products or departments for effective management action. Cost accounting through its marginal costing technique helps the management in profit planning and through it's another technique i.e. standard costing facilitates cost control. In short, cost accounting is management information

System which analyses past, present and future data to provide the basis for managerial decision making.

Definitions-

The Institute of Cost and Works Accountants, London defines cost accounting as,

"Cost Accounting is the technique and process of ascertainment of cost"

The Institute of Cost and Works Accountants, India defines cost accounting as,

"The technique and process of ascertainment of costs. Cost accounts the process of accounting for costs, which begins with the recording of expenses or the bases on which they are calculating and ends with the preparation of statistical data."

Thus, the process of accounting for cost from the point at which expenditure incurs or commit to the establishment of its ultimate relationship with cost centers and cost units. In its wider usage, it embraces the preparation of statistical data; the application of cost control methods and the ascertainment of the profitability of activities carry out or plan.

In other words, cost accounting may be defined as the body of concepts, methods, techniques and procedures used to compute analyses or estimate the cost, profitability and performance of individual product, services or departments and other segments of an enterprise.

Nature and Characteristics of Cost Accounting

The nature and main characteristics of cost accounting are as follows:

(i) Specialized Branch of Accounting: Cost accounting is a specialized branch of accounting which covers collection, classification, recording, apportionment, determination and control of cost. Though it is based on double entry system but has its own concepts and conventions also.

(ii) Art and Science Both: Cost accounting is a science because it has its own principles and rules, which are followed on regular basis and in a systematic manner. It is also an art because its principles and techniques are used in solving the business problems through cost data.

(iii) Recognized as a Profession: As cost accounting is a specialized branch of knowledge, it is recognized as a profession also. The Institute of Cost and Works Accountants of India provides professional assistance to cost accountants and frames the rules for their professional and approach.

(iv) Determination of various Components of Total Cost: It ascertains cost of products and services through the process of accumulation, classification, analysis and recording. The elements of cost include (a) material, (b) labor and, (c) expenses. The main function of this system is to determine total cost and cost per unit. It also determines the cost of incomplete work or job in case if the work remains uncompleted.

(v) Application of Statistical Data of Computing Profit and Cost: The extensive use of system involves application of statistical data, control methods and techniques and determining profitability. The statistical data are helpful in preparation of cost sheet, cost statement, various cost accounts and are used for the purpose of cost comparison.

(vi) Helpful to Management: This system provides information and measures for control and guidance for various levels of management.

Scope of Cost Accounting

The scope of cost accounting is very broad. An organization having an effective cost accounting system helps the management in performance of their responsibilities in an efficient and effective manner. In brief, cost accounting covers the following aspects:

a. Classification of Cost: The cost classification is the process of grouping costs according to their characteristics. In this context the cost can be classified according to elements, functions, nature, controllability, normality and relevance to decision-making.

b. Cost Recording: After cost classification, cost transactions are recorded in various ledger accounts.

c. Cost Allocation: It includes allotment of whole items of cost to cost centers or cost units according to pre-determined basis.

d. Cost Determination: It is also called as „cost measurement" and it means computation of cost of individual products, services, departments or other segments of an enterprises. It can be done by preparing cost sheet or statement of cost. Production account can also be prepared for this purpose.

e. Cost Control: It is an important aspect of cost accounting and for this purpose various techniques such as standard costing, budgetary control, inventory control, quality control, etc. can be adopted.

f. Cost Comparison: It refers to comparison of current cost with previous cost or cost of similar other concerns.

g. Cost Reporting: It means communication of cost data on regular basis which may be used by management for decision-making or which are made available to government or some outside agencies.

h. Cost Reduction: It means permanent and genuine reduction in per unit cost of produced or services rendered.

i. Cost Analysis: It involves the estimation of relationship between costs and various determinants of costs.

j. Cost Audit: It means an examination of the appropriateness of the cost accounting system adopted by the business and effectiveness of its implementation.

Function of Cost Accounting

The main functions or objects of cost accounting are as follows:

a. **Cost ascertainment**: The primary objective of cost accounting is to determine the cost of production of every unit, job, operation, process, department or service. The technique of ascertaining cost is known as „Costing". In order to determine cost, all the expenses are accumulated, classified and analyzed. It not only determines the cost at completion stage but also determines cost at various stages of production.

b. **Cost control**: Cost control is one of the important functions of cost accounting. To measure the efficiency of the organization or of the cost centers, the various operations involved in the manufacture of products are to be carefully studied. Budgets and standards for the consumption of materials, use of labor, and for expending the overhead are to be set and compared with actual performances. The variances arising out of the comparison so made tell the tale whether the cost is within control or not.

c. **Cost reduction**: Cost reduction refers to real or genuine savings through permanent reduction in cost of a product or service without impairing the quality and affecting its purpose for which it was intended to be used. In the competitive market situations, it is utmost important for the organizations to look for activities and search for new technology through research and development activities that can reduce the cost of a product. Cost reduction can be attainable in almost all the areas of business activities. The area covered for cost reduction are like Product design, plant layout, production methods, material substitution, reduction in wastages, innovation marketing strategies, purchasing and material control etc.

d. **Ascertainment of profitability**: It is the object of cost accounting to ascertain the profit making capacity of that activity planned or being carried out and to compare the actual profits made with their profitabilities. Difference is analyzed and efforts are made to earn the maximum profit as per capacity.

e. **Determination of selling price**: The supply price or the tender price of a product depends upon its total cost plus a margin of profit which the businessman wants to make depending upon the inter-play of factors of demand and supply. Cost accounting provides detailed information about the composition of total cost for the determination of the selling price. It also provides information to decide the extent to which the prices can be reduced to meet the challenge arising out of competition, by differentiating the costs into variable and fixed cost. Similarly, in the event of depression or recession, the cost accountant can guide as to which expenses can be curtailed, to reduce the cost of production and thus to decide the minimum selling price.

f. **Providing a basis for business policy and decision-making**: The objective of cost accounting is to help the management in the formulation of business policy and in decision-making.
The gross-profit analysis, the cost-volume-profit relationship, the break-even point of sales, and the differential costing method, etc., help the management in profit-planning and in deciding crucial matters like : (a) introduction or discontinuance of a product; (b) utilization of idle plant capacity; (c) selection of most profitable sales-mix; (d) dumping of goods in a foreign market at a cheaper price; (e) make or buy; (f) purchase of new plant or continuance with the old plant at the of heavy repairs, etc.

g. **Compliance to statutory requirements**: The Central Government, under Section 209(1) (d) of the Companies Act, has made it compulsory for 47 industries to maintain cost accounts. Thus compliance to statutory requirements is also one of the objectives of cost accounting.

Cost Centre- Any unit of cost accounting selected with a view to accumulating all cost under that unit is known as Cost Centre. The unit may be a product, service, division, department, section, a group of plant and machinery, a group of employees of several units. E.g. production department, service department.

Classification of Cost Centre- Process cost center, Production cost center, Service cost center, Impersonal cost center, Personal cost center and Operation cost center.

Distinction between Financial Accounting and Cost Accounting

Though there is much common ground between financial accounting and cost accounting and though in fact cost accounting is an outgrowth of financial accounting yet the emphasis differs. Firstly financial accounting is more attached with reporting the results of business to persons other than internal management – government, creditors, investors, researchers, etc. Cost accounting is an internal reporting system for an organization's own management for decision making. Secondly financial accounting data is historical in nature and its periodicity of reporting is much wider. Cost accounting is more concerned with short-term planning and its reporting period much lesser than financial accounting. It not only deals with historic data but also is futuristic in approach. Thirdly, in financial accounting the major emphasis in cost classification is based on the type of transaction e.g. Salaries, repairs, insurance, stores, etc. But in cost accounting the major emphasis is on functions, activities, products, processes and on internal planning and control and information needs of the organization.

Utility of Cost Accounting

A properly installed cost accounting system will help the management in the following ways:

1. The analysis of profitability of individual products, services or jobs.
2. The analysis of profitability of different departments or operations.
3. It locates differences between actual results and expected results.
4. It will assist in setting the prices so as to cover costs and generate an acceptable level of profit.
5. Cost accounting data generally serves as a base to which the tools and techniques of management accounting can be applied to make it more purposeful and management oriented.
6. The effect on profits of increase or decrease in output or shutdown of a product line or department can be analyzed by adoption of efficient cost accounting system.

Distinction between Costing and Cost Accounting

Costing is the technique and process of ascertaining costs. It tries to find out the cost of doing something, i.e., the cost of manufacturing an article, rendering a service, or performing a function. Cost accounting is a broader term, in that it tries to determine the costs through a formal system of accounting (unlike costing which can be performed even through informal means). Stated precisely, cost accounting is a formal mechanism by means of which costs of products and services are ascertained and controlled. The institute of cost and management accountants, U.K. defines cost accounting as: the application of accounting and costing principles, methods and techniques in the ascertainment of costs and the analysis of savings and/or excesses as compared with previous experience or with standards. It, thus, includes three things:

1. Cost Ascertainment: finding out the specific and precise total and unit costs of products and services.
2. Cost Presentation: reporting cost data to various levels of management with a view to facilitate decision making.
3. Cost Control: this consists of estimating costs for production and activities for the future, and keeping them within proper limits. Budgets and standards are employed for this purpose.

Cost accounting also aims at cost reduction, i.e., achieving a permanent and real reduction in cost by improving the standards. Cost accountancy is a comprehensive term that implies the `application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control‟. It seeks to control costs and ascertain the profitability of business operations.

Classification of Cost In the process of cost accounting, costs are arranged and rearranged in various classifications. The term „classification" refers to the process of grouping costs according to their common characteristics. The different bases of cost classification are:

1. by nature or elements (materials, labor and overheads)

2. by time (historical, pre-determined)

3. by traceability to the product (direct, indirect)

4. by association with the product (product, period)

5. by changes in activity or volume (fixed, variable, semi-variable)

6. by function (manufacturing, administrative, selling, research and development, pre-production)

7. by relationship with the accounting period (capital, revenue)

8. by controllability (controllable, non-controllable)

9. By analytical/decision-making purpose (opportunity, sunk, differential, joint, common, imputed, out-of-pocket, marginal, uniform, replacement)

10. By other reasons (conversion, traceable, normal, avoidable, unavoidable, and total).

Elements of Cost

The elements of costs are the essential part of the cost. There are broadly three elements of cost, as explained below:

(A) Material

The substance from which the produce is made is called material. It can be direct as well as indirect.

I) Direct Material: it refers to those materials which become an integral part of the final product and can be easily traceable to specific physical units. Direct materials, thus, include:

1. All materials specifically purchased for a particular job or process.

2. Components purchased or produced.

3. Primary packing materials (e.g., carton, wrapping, card-board boxes etc.).

4. Material passing from one process to another.

II) Indirect Material: all materials which are used for purpose ancillary to the business and which cannot conveniently be assigned to specific physical units are known as `indirect materials‟. Oil, grease, consumable stores, printing and stationery material etc. are a few examples of indirect materials.

(B) Labour

In order to convert materials into finished products, human effort is required. Such human effort is known as labour.

Labour can be direct as well as indirect.

I) Direct Labour: It is defined as the wages paid to workers who are engaged in the production process and whose time can be conveniently and economically traceable to specific physical units. When a concern does not produce but instead renders a service, the term direct labour or wages refers to the cost of wages paid to those who directly carry out the service, e.g., wages paid to driver, conductor etc. Of a bus in transport service.

II) Indirect Labour: Labour employed for the purpose of carrying out tasks Incidental to goods produced or services provided is called indirect labour or indirect wages. In short, wages which cannot be directly identified with a job, process or operation, are generally treated as indirect wages. Examples of indirect labour are: wages of store-keepers, foremen, supervisors, inspectors, internal transport men etc.

(C) Expenses

Expenses may be direct or indirect.

I) Direct Expenses: These are expenses which can be directly, conveniently and wholly identifiable with a job, process or operation. Direct expenses are also known as chargeable expenses or productive expenses. Examples of such expenses are: cost of special layout, design or drawings, hire of special machinery required for a particular contract, maintenance cost of special tools needed for a contract job, etc.

II) Indirect Expenses: Expenses which cannot be charged to production directly and which are neither indirect materials nor indirect wages are known as indirect expenses. Examples are rent, rates and taxes, insurance, depreciation, repairs and maintenance, power, lighting and heating etc.

The above elements of cost may be shown as follows:

Element of cost

a. Direct/indirect Materials

b. Direct/indirect labour

c. Direct/indirect expenses

1. Overheads

The term overheads includes, indirect material, indirect labour and indirect expenses, explained in the preceding paragraphs. Overheads may be incurred in the factory, office or selling and distribution departments/ divisions in an undertaking. Thus overheads may be of three types: factory overheads, office and administrative overheads and selling and distribution overheads. This classification of overheads may be shown thus:

Classification of Overheads

Overheads

Direct Overheads

Factory Overheads - Indirect

Office Overheads - Indirect

Selling and distribution Overheads - Indirect

2. Cost Classification by Time

On the basis of the time of computing costs, they can be classified into historical and pre-determined costs.

I) Historical Costs: These costs are computed after they are incurred. Such costs are available only after the production of a particular thing is over.

II) Pre-Determined Costs: These costs are computed in advance of production on the basis of a specification of all factors influencing cost. Such costs may be:
1. Estimated costs: estimated costs are based on a lot of guess work. They try to ascertain what the costs will be based on certain factors. They are less accurate as only past experience is taken into account primarily, while computing them.
2. Standard costs: standard costs is a pre-determined cost based on a technical estimate for material, labour and other expenses for a selected period of time and for a prescribed set of working conditions. It is more scientific in nature and the object is to find out what the costs should be.

3. Cost Classification by Traceability

As explained previously, costs which can be easily traceable to a product are called direct costs. Indirect costs cannot be traced to a product or activity. They are common to several products (e.g., salary of a factory manager, supervisor etc.) And they have to be apportioned to different products on some suitable basis. Indirect costs are also called `overheads".

4. Cost Classification by Association with Product

Costs can also be classified (on the basis of their association with products) as product costs and period costs.

1. Product Costs: product costs are traceable to the product and include direct material, direct labour and manufacturing overheads. In other words, product cost is equivalent to factory cost.

2. Period Costs: period costs are charged to the period in which they are incurred and are treated as expenses. They are incurred on the basis of time, e.g., rent, salaries, insurance etc. They cannot be directly assigned to a product, as they are incurred for several products at a time (generally).

5. Cost Classification by Activity/Volume

Costs are also classified into fixed, variable and semi-variable on the basis of variability of cost in the volume of production.

1. Fixed Cost:

Fixed cost is a cost which tends to be unaffected by variations in volume of output. Fixed cost mainly depends on the passage of time and does not vary directly with the volume of output. It is also called period cost, e.g., rent, insurance, depreciation of buildings etc. It must be noted here that fixed costs remain fixed up to a certain level only. These costs may also vary after a certain production level.

2. Semi-Variable Cost:

These costs are partly fixed and partly variable. Because of the variable element, they fluctuate with volume and because of the fixed element; they do not change in direct proportion to output. Semi-variable or semi-fixed costs change in the same direction as that of the output but not in the same proportion. For example, the expenditure on maintenance is to a great extent fixed if the output does not change significantly. Where, however, the production rises beyond a certain limit, further expenditure on maintenance will be necessary although the increase in the expenditure will not be in proportion to the rise in output. Other examples in this regard are: depreciation, telephone rent, repairs etc.

3. Variable Cost:

Cost which tends to vary directly with volume of outputs is called `variable cost". It is a direct cost. It includes direct material, direct labour, direct expenses etc. It should be noted here that the variable cost per unit is constant but the total cost changes corresponding to the levels of output. It is always expressed in terms of units, not in terms of time.

6. Cost Classification by Function

On the basis of the functions carried out in a manufacturing concern, Costs can be classified into four categories:

1. Manufacturing/Production Cost: it is the cost of operating the manufacturing division of an enterprise. It is defined as the cost of the sequence of operations which begin with supplying materials, services and ends with the primary packing of the product.

2. Administrative/Office Cost: it is the cost of formulating the policy, directing the organization and controlling the operations of an undertaking, which is not directly related to production, selling, distribution, research or development. Administration cost, thus, includes all office expenses: remuneration paid to managers, directors, legal expenses, depreciation of office premises etc.

3. Selling Cost: selling cost is the cost of seeking to create and stimulate demand e.g., advertisements, show room expenses, sales promotion expenses, discounts to distributors, free repair and servicing expenses, etc.

4. Distribution Cost: it is the cost of the sequence of operations which begins with making the packed product, available for dispatch and ends with making the reconditioned returned empty package, if any, available for re-use. Thus, distribution cost includes all those expenses concerned with dispatching and delivering finished products to customers, e.g., warehouse rent, depreciation of delivery vehicles, special packing, loading expenses, carriage outward, salaries of dispatch clerks, repairing of empties for re-use, etc.

5. Research and Development Cost: It is the cost of discovering new ideas, processes, and products by experiment and implementing such results on a commercial basis.

6. Pre-Production Cost: Expenses incurred before a factory is started and expenses involved in introducing a new product are preproduction costs. They are treated as deferred revenue expenditure and charged to the cost of future production on some suitable basis.

7. Cost Classification by Relationship with Controllability

On the basis of controllability, costs can be classified as controllable or uncontrollable.

1. Controllable Cost: A cost which can be influenced by the action of a specified member of an undertaking is a controllable cost, e.g., direct materials, direct labour etc.

2. Uncontrollable Cost: A cost which cannot be influenced by the action of a specified member of an undertaking is an uncontrollable cost, e.g., rent, rates, taxes, salary, insurance etc. The term controllable cost is often used in relation to variable cost and the term uncontrollable cost in relation to fixed cost. It should be noted here that a controllable cost can be controlled by a person at a given organization level only. Sometimes two or more individuals may be involved in controlling such a cost.

8. Cost Classification by Decision-Making Purpose

Costs may be classified on the basis of decision-making purposes for which they are put to use, in the following ways:

1. Opportunity Cost: It is the value of the benefit sacrificed in favor of choosing a particular alternative or action. It is the cost of the best alternative foregone. If an owned building, for example, is proposed to be used for a new project, the likely revenue which the building could fetch, when rented out, is the opportunity cost which should be considered while evaluating the profitability of the project.

2. Sunk Cost: A cost which was incurred or sunk in the past and is not relevant for decision-making is a sunk cost. It is only historical in nature and is irrelevant for decision-making. It may also be defined as the difference between the purchase price of an asset and its salvage value.

3. Differential Cost: The difference in total costs between two alternatives is called as differential cost. In case the choice of an alternative results in increase in total cost, such increase in costs is called `incremental cost‟. If the choice results in decrease in total costs, the resulting decrease is known as detrimental cost.

4. Joint Cost: Whenever two or more products are produced out of one and the same raw material or process, the cost of material purchased and the processing are called joint costs. Technically speaking, joint cost is that cost which is common to the processing of joint products or byproducts up to the point of split-off or separation.

5. Common Cost: Common cost is a cost which is incurred for more than one product, job territory or any other specific costing object. It cannot be treated to individual products and, hence, apportioned on some suitable basis.

6. Imputed Cost: This type of cost is neither spent nor recorded in the books of account. These costs are not actually incurred (hence known as hypothetical or notional costs) but are considered while making a decision. For example, in accounting, interest and rent are recognized only as expenditure when they are actually paid. But in costing, they are charged on a notional basis while ascertaining the cost of a product.

7. Out-Of-Pocket Cost: It is the cost which involves current or future expenditure outlay, based on managerial decisions. For example a company has its own trucks for transporting goods from

One place to another. It seeks to replace these by employing public carriers of goods. While making this decision, management can ignore depreciation, but not the out-of-pocket costs in the present situation, i.e., fuel, salary to drivers and maintenance paid in cash.

8. Marginal Cost: It is the aggregate of variable costs, i.e., prime cost plus variable overheads.

9. Replacement Cost: It is the cost of replacing a material or asset in the current market.

MARGINAL COSTING

Marginal costing is a technique of costing. This technique of costing uses the concept `marginal cost‟. Marginal cost is the change in the total cost of production as a result of change in the production by one unit. Thus marginal cost is nothing but variable cost. In marginal costing technique only variable costs are considered while calculating the cost of the product, while fixed costs are charged against the revenue of the period. The revenue arising from the excess of sales over variable costs is known as `contribution‟. Using contribution as a vital tool, marginal costing helps to a great extent in the managerial decision making process. This unit deals with the various aspects of marginal costing.

Marginal Costing is very important technique in solving managerial problems and contributing in various areas of decisions. In this context profitability of two or more alternative options is compared and such options is selected which offers maximum profitability along with fulfillment of objectives of the enterprise.

Marginal costing - definition

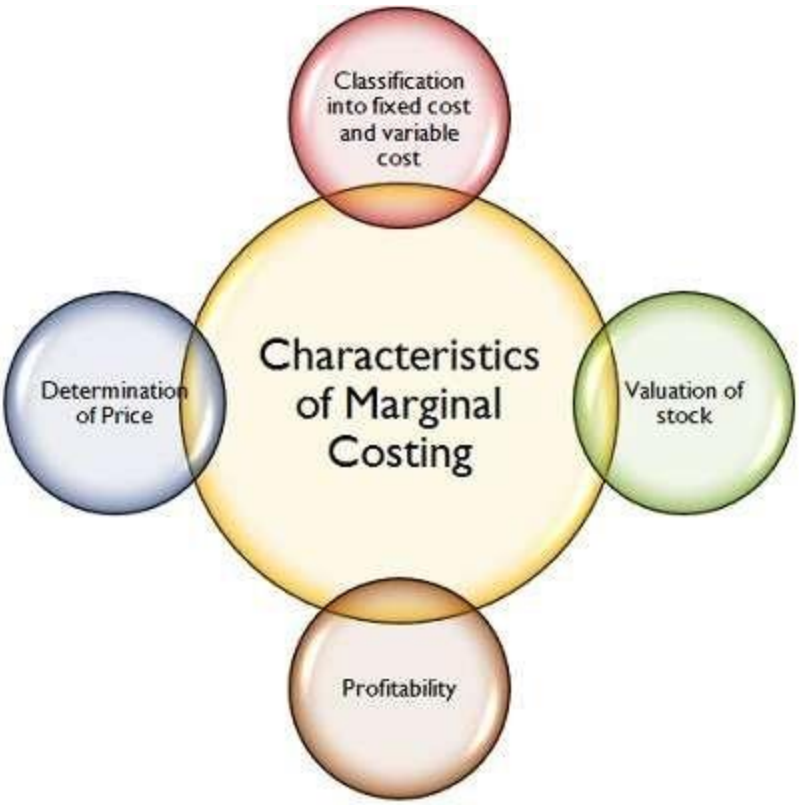
Marginal costing distinguishes between fixed costs and variable costs as convention ally classified.

The marginal cost of a product –"is its variable cost". This is normally taken to be; direct labor, direct material, direct expenses and the variable part of overheads.

Marginal costing is formally defined as:

The accounting system in which variable costs are charged to cost units and the fixed costs of the period are written-off in full against the aggregate contribution. Its special value is in decision making‟. (Terminology.)

The term "contribution" mentioned in the formal definition is the term given to the difference between Sales and Marginal cost.



Thus, **Marginal Cost = Direct Material + Direct Labor + Direct Expenses + Variable Overheads**

Marginal Cost

The term marginal cost sometimes refers to the marginal cost per unit and sometimes to the total marginal costs of a department or batch or operation. The meaning is usually clear from the context.

Note- Alternative names for marginal costing are the contribution approach and direct costing.

Contribution

The difference between selling price and variable cost (or marginal cost) is known as "Contribution" or 'gross margin'. It may be considered as some sort of fund from out of which all fixed costs are met. The difference between contribution and fixed cost represents either profit or loss, as the case may be. Contribution is calculated thus:

Contribution = Selling Price – Variable Cost

= Fixed Cost + Profit or – Loss

It is clear from the above equation that profit arises only when contribution exceeds fixed costs. In other terms, the point of „no profit no loss" will be at a level where contribution is equal to fixed costs.

Marginal cost equation

The algebraic expression of contribution is known as marginal cost equation. It can be expressed thus:

$S - V = F + P$

$S - V = C$

$C = F + P$ And In Case Of Loss

$C = F - L$

Where: S = Sales

V = Variable Cost

C = Contribution

F = Fixed Cost

P = Profit

L = Loss

Profit Volume Ratio (P/V Ratio)

The profitability of business operations can be found out by calculating the p/v ratio. It shows the relationship between contribution and sales and is usually expressed in percentage. It is also known as „marginal-income ratio", „contribution-sales ratio" or `variable-profit ratio". P/v ratio thus is the ratio of contribution to sales, and is calculated thus:

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} 100$$

$$= \frac{C}{S} \text{ or } \frac{S - V}{S} \text{ or } \frac{F + P}{S}$$

$$= 1 - \frac{\text{Variable Costs}}{\text{Sales}}$$

The ratio can also be shown by comparing the change in contribution to change in sales, or change in profit to change in sales. Any increase in contribution, obviously, would mean increase in profit, as fixed expenses are assumed to be constant at all levels of production.

$$\text{P/V Ratio} = \frac{\text{Change in Contribution}}{\text{Change in Sales}}$$

$$= \frac{\text{Change in Profit}}{\text{Change in Sales}}$$

The importance of p/v ratio lies in its use for evaluating the profitability of alternative products, proposals or schemes. A higher ratio shows greater profitability. Management should, therefore,

Try to increase p/v ratio by widening the gap between the selling price and the variable costs. This can be achieved by increasing sale price, reducing variable costs or switching over to more profitable products.

Break-Even or Cost-Volume-Profit Analysis

Break-even analysis is a specific method of presenting and studying the inner relationship between costs, volume and profits. (Hence, the name c-v-p analysis). It is an important tool of financial analysis whereby the impact on profit of the changes in volume, price, costs and mix can be found out with a certain amount of accuracy. A business is said to break even when its total sales are equal to its total costs. It is a point of no profit or no loss. At this point contribution is equal to fixed costs. Break-even point, can be calculated thus:

$$\text{B.E.P. (In Units)} = \frac{\text{Fixed Cost}}{\text{Contribution Per Unit}}$$

$$= \frac{\text{Fixed Cost}}{\text{Selling Price/Unit} - \text{Marginal Cost/Unit}}$$

$$\text{B.E.P. (Sales)} = \frac{\text{Fixed Cost}}{\text{Contribution per Unit}} \times \text{Selling Price/Unit}$$

$$= \frac{\text{Fixed Cost}}{\text{Total Contribution}} \times \text{Total Sales}$$

$$\text{Or} = \frac{F \times S}{S - V}$$

$$\text{Or} = \frac{\text{Fixed Cost}}{\text{Variable Cost per Unit}}$$

$$1 - \frac{\text{Variable Cost per Unit}}{\text{Selling Price per Unit}}$$

$$\text{Or} = \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$$

At break-even point the desired profit is zero. Where the volume of output or sales is to be calculated so as to earn a desired amount of profit, the amount of desired profits has to be added to the fixed cost given in the above formula.

$$\text{Units to Earn A Desired Profit} = \frac{\text{Fixed Cost + Desired Profit}}{\text{Contribution per Unit}}$$

$$\text{Sales to Earn a Desired Profit} = \frac{\text{Fixed Cost + Desired Profit}}{\text{P/V Ratio}}$$

Cash Break-Even Point

It is the level of output or sales where the cash inflow will be equivalent to cash needed to meet immediate cash liabilities. To this end, fixed costs have to be divided into two parts (i) fixed cost which do not need immediate cash outlay (depreciation etc.) And (ii) fixed cost which need immediate cash outlay (rent etc.). Cash break-even point can be calculated thus:

$$\text{Cash Break-Even Point (Of Output)} = \frac{\text{Cash Fixed Costs}}{\text{Cash Contribution per Unit}}$$

Composite Break-Even Point

Where a firm is dealing with several products, a composite breakeven point can be calculated using the following formula:

$$\text{Composite Break-Even Point (Sales)} = \frac{\text{Cash Fixed Costs}}{\text{Composite P/V Ratio}}$$

$$\text{Or} = \frac{\text{Total Fixed Costs X Total Sales}}{\text{Total Contribution}}$$

$$\text{Or} = \frac{\text{Total Contribution}}{\text{Total Sales}} \times 100$$

Margin of Safety

Total sales minus the sales at break-even point are known as the margin of safety. Lower break-even point means a higher margin of safety. Margin of safety can also be expressed as a percentage of total sales. The formula is:

Margin of Safety = Total Sales – Sales at B.E.P.

$$\text{Or} = \frac{\text{Profit}}{\text{P/V Ratio}}$$

$$\text{Margin of Safety (\%)} = \frac{\text{Margin of Safety}}{\text{Total Sales}} 100$$

Higher margin of safety shows that the business is sound and when sales substantially come down, (but not below breakeven sales) profit might be earned by the business. Lower margin of safety, as pointed out earlier, means that when sales come down slightly profit position might be affected adversely. Thus, margin of safety can be used to test the soundness of a business. In order to improve the margin of safety a business can increase selling prices (without affecting demand, of course) reducing fixed or variable costs and replacing unprofitable products with profitable one.

Theory of Marginal Costing

The theory of marginal costing as set out in "A report on Marginal Costing" published by CIMA, London is as follows:

In relation to a given volume of output, additional output can normally be obtained at less than proportionate cost because within limits, the aggregate of certain items of cost will tend to remain fixed and only the aggregate of the remainder will tend to rise proportionately with an increase in output. Conversely, a decrease in the volume of output will normally be accompanied by less than proportionate fall in the aggregate cost.

The theory of marginal costing may, therefore, by understood in the following two steps:

1. If the volume of output increases, the cost per unit in normal circumstances reduces. Conversely, if an output reduces, the cost per unit increases. If a factory produces 1000 units at a total cost of Rs.3,000 and if by increasing the output by one unit the cost goes up to Rs.3,100, the marginal cost of additional output will be Rs.100.

2. If an increase in output is more than one, the total increase in cost divided by the total increase in output will give the average marginal cost per unit. It can be described as follows:
   The ascertainment of marginal cost is based on the classification and segregation of cost into fixed and variable cost. In order to understand the marginal costing technique, it is essential to understand the meaning of marginal cost.

Marginal cost means the cost of the marginal or last unit produced. It is also defined as the cost of one more or one less unit produced besides existing level of production. In this connection, a unit may mean a single commodity, a dozen, and a gross or any other measure of goods.
Example, if a manufacturing firm produces X unit at a cost of Rs.300 and X+1 unit at a cost of Rs.320, the cost of an additional unit will be Rs.20 which is marginal cost. Similarly if the

Production of X-1 units comes down to Rs.280, the cost of marginal unit will be Rs.20 (300–280).

The marginal cost varies directly with the volume of production and marginal cost per unit remains the same. It consists of prime cost, i.e. cost of direct materials, direct labor and all variable overheads. It does not contain any element of fixed cost which is kept separate under marginal cost technique.

Marginal costing may be defined as the technique of presenting cost data wherein variable costs and fixed costs are shown separately for managerial decision-making. It should be clearly understood that marginal costing is not a method of costing like process costing or job costing. Rather it is simply a method or technique of the analysis of cost information for the guidance of management which tries to find out an effect on profit due to changes in the volume of output.
There are different phrases being used for this technique of costing. In UK, marginal costing is a popular phrase whereas in US, it is known as direct costing and is used in place of marginal costing. Variable costing is another name of marginal costing.
Marginal costing technique has given birth to a very useful concept of contribution where contribution is given by: Sales revenue less variable cost (marginal cost)
Contribution may be defined as the profit before the recovery of fixed costs. Thus, contribution goes toward the recovery of fixed cost and profit, and is equal to fixed cost plus profit (C = F + P).

In case a firm neither makes profit nor suffers loss, contribution will be just equal to fixed cost (C = F). This is known as breakeven point.
The concept of contribution is very useful in marginal costing. It has a fixed relation with sales. The proportion of contribution to sales is known as P/V ratio which remains the same under given conditions of production and sales.

Definition: Marginal Costing is a costing technique wherein the marginal cost, i.e. variable cost is charged to units of cost, while the fixed cost for the period is completely written off against the contribution.

The term **marginal cost implies the additional cost involved in producing an extra unit of output**, which can be reckoned by total variable cost assigned to one unit. It can be calculated as:

Classification into Fixed and Variable Cost: Costs are bifurcated, on the basis of variability into fixed cost and variable costs. In the same way, semi variable cost is separated.

Valuation of Stock: While valuing the finished goods and work in progress, only variable cost is taken into account. However, the variable selling and distribution overheads are not included in the valuation of inventory.

Limitations of Marginal Costing

Marginal costing has the following limitations:

1. Difficulty in classification: In marginal costing, costs are segregated into Fixed and variable. In actual practice, this classification scheme proves to be Superfluous in that, certain costs may be partly fixed and partly variable and certain other costs may have no relation to volume of output or even with the time. In short, the categorization of costs into fixed and variable elements is a difficult and tedious job.

2. Difficulty in Application: The marginal costing technique cannot be applied in industries where large stocks in the form of work-in-progress (job and contracting firms) are maintained.

3. Defective Inventory Valuation: Under marginal costing, fixed costs are not included in the value of finished goods and work in progress. As fixed costs are also incurred, these should form part of the cost of the product. By eliminating fixed costs from finished stock and work-in-progress, marginal costing techniques present stocks at less than their true value. Valuing stocks at marginal cost is objectionable because of other reasons also:
1. In case of loss by fire, full loss cannot be recovered from the insurance company.
2. Profits will be lower than that shown under absorption costing and hence may be objected to by tax authorities.
3. Circulating assets will be understated in the balance sheet.

4. **Wrong Basis for Pricing:** In marginal costing, sales prices are arrived at on the basis of contribution alone. This is an objectionable practice. For example, in the long run, the selling price should not be fixed on the basis of contribution alone as it may result in losses or low profits. Other important factors such as fixed costs, capital employed should also be taken into account while fixing selling prices. Further, it is also not correct to lay more stress on selling function, as is done in marginal costing, and relegate production function to the background.

5. ***Limited Scope:*** The utility of marginal costing is limited to short-run profit planning and decision-making. For decisions of far-reaching importance, one is interested in special purpose cost rather than variable cost. Important decisions on several occasions depend on non-cost considerations also, which are thoroughly discounted in marginal costing.

In view of these limitations, marginal costing needs to be applied with necessary care and caution. Fruitful results will emerge only when management tries to apply the technique in combination with other useful techniques such as budgetary control and standard costing.

Make or Buy Decision

„Make or Buy Decision" is a problem in respect of which management has to take decision continuously, in this context, the management has to decide whether a certain product or component should be made in the factory itself or bought from outside suppliers.

The nature of decision regarding make or buy may be of the following types:

(a) Stopping the production of the part and buying it from the market: A business co is already making a part or component which is used in the business. Now due to some decision has to be taken whether this part or component should be bought from the market additional requirement due to increase in production of main factory should be made in factory or should be bought from the market.

In the case of a decision like stopping the production of the part or component and buying it from market, it is to be remembered that there would not be additional fixed cost in case and only marginal cost is the relevant factor to be considered. If the marginal cost is less than buying price, additional requirement of the component should be met by making rather than buying. Similarly, if buying price is less than marginal cost, it will be advantageous to purchase it from the market.

(b) Stopping the purchase of a component and to produce it in own factory: The second aspect of the problem of make or buy may be that a component or part thus far being purchased from the market should be produced or made in factory or not. In this case, normally some extra arrangement regarding space, labour, machine etc. will be required. This may involve capital investment too. Some special overheads may also be necessary. If the decision for making requires the setting up of a new and separate factory, separate supervisory staff may also be needed. All these arrangements will require additional costs. As such, the price being paid to outsiders should be compared with additional costs which will have to be incurred in the form of raw materials, wages, salaries of additional supervisors, interest on capital investment, depreciation on new machine, rent of premises etc. If such additional cost are less than the buying price, the component should be manufactured and vice-versa.

Change in Product Mix

(a). Introducing a new line or department: The problem of introducing a new product or line involves decision in two respects- whether a new product or line should be added to the existing production or not, and if it should be introduced, then what should be the model or design or shape of the new product. In other words, if new product can be produced in more than one model, which model should be introduced? The marginal cost of new product in all its possible models should be considered. It also possible that a portion of the cost of facilities relating to the original production may be used for the purpose of producing new product.

(b). Selecting optimum product mix: When a company is engaged in a number of lines or products, there may arise a problem of selecting most optimum product mix which would maximize the earnings. This problem becomes complicated, when one of the factors happens to be limiting or key factors. Under such a situation, profitability will be improved only by economizing the scarce resources. As pointed out earlier, contribution per unit of key factor is the real index of profitability under such case. Thus, while deciding a profitable mix of products, contribution per unit of key factor should be considered.

Shut-Down Decisions

Shut-down decisions may be of two types- closure of entire business and dropping a line or product or department.

Closure of entire business: Sometimes, a business concern may not be in a position to carry out its trading activities in an adequate volume due to trade recession or cut throat competition. As such, the management of such business concern may be faced with a problem of suspending the trading activities.

Shut-down point = Net escapable fixed cost / contribution per unit

Or

Shut-down point = Avoidable expenses / contribution per unit of raw materials

STANDARD COSTING

Standard:

According to Prof. Erie L. Kolder, "Standard is a desired attainable objective, a performance, a goal, a model".

Standard Cost:

Standard cost is a predetermined estimate of cost to manufacture a single unit or a number of units during a future period.

The Chartered Institute of Management Accountants, London, defines "Standard Cost" as, "a pre-determined cost which is calculated from management's standards of efficient operation and the relevant necessary expenditure. It may be used as a basis for price fixing and for cost control through variance analysis".

Standard Costing:

According to the Chartered Institute of Management Accountants, London Standard Costing is "the preparation and use of Standard Cost, their comparison with actual costs, and the analysis of variances to their causes and points of incidence".

The study of standard cost comprises of:

1. Ascertainment and use of standard costs.
2. Comparison of actual costs with standard costs and measuring the variances.
3. Controlling costs by the variance analysis.
4. Reporting to management for taking proper action to maximize the efficiency.

Objectives of Standard Costing

1. The objectives of standard costing technique are as follows:
2. To provide a formal basis for assessing performance and efficiency.
3. To control costs by establishing standards and analyzing of variances.
4. To enable the principle of „management by exception" to be practiced at the detailed operational level.
5. To assist in setting budgets

Advantages of Standard Costing

A good standard costing system results in the following advantages:

1. The setting of standards should result in the best resources and methods being used and thereby increase efficiency.
2. Budgets are compiled from standards.
3. Actual costs can be compared with standard costs in order to evaluate performance
4. Areas of strengths and weakness are highlighted.
5. It acts as a form of feed forward control that allows an organization to plan the manufacturing inputs required for different levels of output.
6. It acts as a form of feedback control by highlighting performance that did not achieve the standard set.
7. It operates via the management by exception principle where only those variances (i.e. Differences between actual and expected results) which are outside certain tolerance limits are investigated, thereby saving managerial time and maximizing managerial efficiency.
8. The process of setting, revising and monitoring standards encourages reappraised of methods, materials and techniques thus leading to cost control as an immediate effect and to cost reduction as a long term effect.

Limitations of Standard Costing

Standard costing suffers from the following limitations:

1. A lot of input data is required which can be expensive.
2. Unless standards are accurately set any performance evaluation will be meaningless.
3. Uncertainty in standard costing can be caused by inflation, technological change, economic and political factors, etc. Standards therefore need to be continually updated and revised.
4. The maintenance of the cost data base is expensive.
5. Setting of standards involves forecasting and subjective judgments with inherent possibilities of error and ambiguity.
6. Standard costing cannot be adopted in the firms which do not have uniform and standard production programme.
7. It is very difficult to predict controllable and uncontrollable variances.

Budgetary Control and Standard Costing

The systems of budgetary control and standard costing have the common objective of controlling business operations by establishing pre-determined targets, measuring the actual performance and comparing it with the targets, for the purposes of having better efficiency and of reducing costs. These two systems are said to be interrelated but they are not inter-dependent. The budgetary control system can function effectively even without the system of standard costing in operation but the vice-versa is not true. Usually, the two are used in conjunction with each other to have most fruitful results. The distinction between the two systems is mainly on account of the field or scope and technique of operation.

Both standard costing and budgetary control aim at maximum efficiency and managerial control.

Budgetary control and standard costing have the common objective of controlling business

Operations by establishing pre-determined targets, measuring the actual performance and comparing it with the targets, for the purposes of having better efficiency and of reducing costs. The two systems are said to be interrelated but they are not inter-dependent. The budgetary control system can function effectively even without the system of standard costing in operation but the vice-versa is not possible.

Standard Costing as a Controlling Technique

It is essential for management to have knowledge of costs so that decision can be effective. Management can control costs on information being provided to it. The technique of standard costing is used for building a proper budgeting and feedback system. The uses of standard costing to management are as follows.

Variance Analysis

The difference between the standard cost and the actual cost is known as „cost variance". If actual cost is less than the standard cost, the variance is favorable. If the actual cost is more than the standard cost, the variance is unfavorable. A favorable variance indicates efficiency, while an unfavorable one denotes inefficiency. However, mere knowledge of these variances would not be useful for ensuring cost control. These have to be thoroughly analyzed so as to find out the contributory factors. It would then be possible to find out whether the variances are amenable to control or not. The term „variance analysis", thus, may be defined as „the resolution into constituent parts and the explanation of variances".

1. Formulation of Price and Production Policies

Standard Costing acts as a valuable guide to management in the fixation of price and formulation production polices. It also assists management in the field of inventory pricing, product, product pricing profit planning and also in reporting to top management.

2. Comparison and Analysis of Data

Standard Costing provides a stable basis for comparison of actual with standard costs. It brings out the impact of external factors and internal causes on the cost and performance of the concern. Thus, it helps to take remedial action.

3. Cost Consciousness

An atmosphere of cost consciousness is created among the staff. Standard costing also provides incentive to workers for efficient performance.

4. Better Capacity to Anticipate

An effective budget can be formulated for the future by laving price knowledge of the deviations of actual costs from standard costs. Data are available at an early stage and the capacity to anticipate about changing conditions is developed.

Setting the Standard

While setting standard cost for operations, process or products, the following preliminaries must be gone through:

1. Establish Standard Committee comprising Purchase Manager, Personnel Manager, and Production Manager. The Cost Accountant coordinates the functions.
2. Study the existing costing system, cost records and forms in use.
3. A technical survey of the existing methods of production should be undertaken.
4. Determine the type of standard to be used.
5. Fix standard for each element of cost.
6. Determine standard costs of r each product.
7. Fix the responsibility for setting standards.
8. Account variances properly.
9. Ascertain the deviations by comparing the actual with standards.
10. Take necessary action to ensure that adverse variances are not repeated.

Determination of Standard Costs

The following preliminary steps are considered before setting standards:

(a) Establishment of cost center

(b) Classification and codification of accounts

(c) Types of standards

(d) Setting the standards.

(a) Establishment of cost center. For fixing responsibility and defining the lines of authority, cost center is necessary. "A cost center is a location, person or item of equipment (or group of these) for which costs may be ascertained and used of the purpose of cost control". With the help of cost center, the standards are prepared and the variances are analyzed.

(b) Classification and codification of accounts. Accounts are classified according to different items of expenses under suitable heading. Each heading may be given codes and symbols. Coding is useful for speedy collection and analysis.

(c) Types of standards. The different types of standards are given below:

(i) ***Basic standard***. It is fixed and unaltered for an indefinite period for forward planning. According to I.C.M.A London, it is "an underlying standard from which a current standard can be developed". From this basic standard, changes in current standard and actual standard can be measured.

(ii) ***Current standard***. It is a short-term standard, as it is revised at regular intervals. I.C.M.A. London refers to it as "a standard which is established for use over a short period of time and is related to current conditions". This standard is realistic and helpful to business. It is useful for cost control.

(iii) ***Normal standard***. It is an average standard, and is based on normal conditions which prevail over a long period of a trade cycle. I.C.M.A defines it as "the average standard which, it is anticipated, can be attained over a future period of time, preferably long enough to cover one trade-cycle". It is used for planning and decision making during the period of trade cycle to which it is related. It is very difficult to apply in practice.

(iv) ***Ideal standard***. I.C.M.A. defines it as "the standard which can be attained under the most favorable condition possible". It is fixed and needs a high degree of efficiency, best possible conditions of management and performance. Existing conditions and conditions capable of achievement should be taken into consideration. It is difficult to attain this ideal standard.

(v) Expected standard. It is a practical standard. I.C.M.A defines it as, "the standard which, it is anticipated, can be attained during a future specified budget period". For setting this standard, due weightage is given for all the expected conditions. It is more realistic than the ideal standard.

(d) Setting the standards. After choosing the standard, the setting of standard is the work of the standard committee. The cost accountant has to supply the necessary cost figures and co-ordinate the activity committee. He must ensure that the setting standards are accurate.

Standards cost is determined for each element of the following costs.

(i) Direct Material cost. Standard material cost is equal to the standard quantity multiplied by the standard price. The setting of standard costs for direct materials involves

(a) ***Standard Material Quantity***. For each product or part or the process, mechanical calculation or mechanical analysis is made. The allowance for normal wastage or loss must be fixed very carefully. Similarly, where different kinds of materials are used as a mix for a process, a standard material mix is determined to produce the desire quality product.

(b) ***Standard Material Price***. Setting of material standard price is done by the cost accountant and the purchase manager. The current standard is the desirable and effective for fixing the price. Normally one year is the period for fixation of standard price. If there are more fluctuations in prices, then revision of standard price is necessary. Before fixing the standard, the following points must be considered:

Prices of materials in stock

Price quoted by suppliers

Trade and cash discounts received

Future prices based upon statistical data

Material price already contracted

(ii) ***Setting standard for Direct Labour***. The standard labour cost is equal to the standard time for each operation multiplied by the standard wage rate. Setting of standard cost of direct labour involves:

(a) Fixation of standard time

(b) Fixation of standard rate

(a) ***Fixation of standard time***: Standard time is fixed by time or motion study or past records or test runs or estimates. Labour time is fixed by the work study engineer. While fixing standard time, normal ideal time is allowed for fatigue, normal delays or other contingencies.

(b) ***Fixation of standard rate***. With the help of the personnel manager, the accountant determines the standard rate. Fixation of standard rate is influenced by (i) Union's policy (ii) Demand for labour (iii) Policy the be followed. (iv) Method of wage payment.

(iii) ***Setting standard for Overhead***. Overheads are divided into fixed, variable and semi-variable. Standard overhead rate is determined on the basis of past records and future trend of prices. It is calculated for a unit or for an hour.

Standard variable overhead rate=

$$\frac{\text{Standard variable overhead for the budget Period}}{\text{Budgeted production units or budgeted hours for the budgeted period (or some other base)}}$$

Standard fixed overhead rate=

$$\frac{\text{Standard overheads for the budget period}}{\text{Budgeted production units or budgeted hours for the budgeted period (or some other base)}}$$

Revision of Standards

Standard cost may be established for an indefinite period. There are no definite rules for the selection for a particular period. If the standards are fixed for a short period, it is expensive and frequent revision of standards will impair the utility and purpose for which standard is set.

At the same, if the standard is set for a longer period, it may not be useful particularly in the days of high inflation and large fluctuations of rates in case of materials and labour.

Standards have to be revised from time to time taking into consideration changing circumstances. The circumstances may change on account of technical innovations, changed market conditions, increase or decrease in plant capacity, developing new products or giving up

Unprofitable production lines. If variations from actual occur in practice, they may be due to controllable or uncontrollable causes. Standards should be revised only on account of those causes which are beyond the control of the management. Changes in product design, supply of labour and material, changes in market conditions for a long period, trade or cyclical variations would impel the management to revise the standards. The objective, while comparing the actual performance with the standard performance and revising standards, is to facilitate better control over costs and improve the overall working and profitability of the organization.

Apart from the above, basic standards are revised in the course of time under the following circumstances, when:

1. There are permanent changes in the method of production –designs and specifications.
2. Plant capacity is changed
3. There is a large variation between the standard and the actual.
4.

Budgetary Control and Standard Costing

The systems of budgetary control and standard costing have the common objective of controlling business operations by establishing pre-determined targets, measuring the actual performance and comparing it with the targets, for the purposes of having better efficiency and of reducing costs. These two systems are said to be interrelated but they are not inter-dependent. The budgetary control system can function effectively even without the system of standard costing in operation but the vice-versa is not true. Usually, the two are used in conjunction with each other to have most fruitful results. The distinction between the two systems is mainly on account of the field or scope and technique of operation.

Budgeting	Standard costing
1. Budgetary control is concerned with the operation of the business as a whole and hence it's more extensive	1. Standard Costing is related with the control of the expenses and hence it is more intensive
2. Budget is a projection of financial accounts	2. Standard cost is the projection of cost accounts
3. It does not necessarily involve standardization of products.	3. It requires standardization of products.
4. Budgetary control can be adopted in part also.	4. It is not possible to operate this system in parts
5. Budgeting can be operated	5. Standard costing cannot exist

Without standard costing.	without budgeting.
6. Budgets determine the ceilings of expenses above which actual expenditure should not normally rise.	6. Standards are minimum targets which are to be attained by actual performance at specific efficiency level.