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Unit 4

Controlling

MODERN TECHNIQUES Besides the traditional techniques of budgetary control and standard costing, there are several'-other techniques of control which have been developed in modern times. These techniques may also be called non-budgetary techniques. One or more of these techniques may be adopted alongwith budgetary control and standard costing. Let us discuss the more important techniques in detail.

Break-Even Analysis :

Break even analysis as a technique of control consists of the analysis of costs in relation to changes in the volume of sales and its impact on profit. It is basically concerned with determining the relationship between cost, volume of sales and profit. One of the major concerns of the management of an enterprise relates lo the impact of changes in the volume of sales on profits. It is of interest to them to know the volume of sales at which costs will be fully covered and beyond which profits will be earned. For this purpose, two types of costs are distinguished. Variable costs (like direct materials cost, direct wages, etc.) and Fixed costs (like factory and office rent, managers' salary, etc.). If production and sales increase, variable cost per unit remains constant but fixed cost per unit decline. Suppose, the direct materials cost of a product is Rs. 10 per unit and direct wages per unit comes to be Rs. 5, whereas fixed cost upto the total production capacity is Rs. 400. Then, for 100 units produced and sold, the variable cost will amount to Rs. (10 + 5) x 100 i.e., Rs. 1500. For 200 units, the variable cost will be double the amount i.e., Rs. 3000. Fixed cost remains the same. Total cost for 100 units will thus be Rs. 1900, and for 200 units it would be Rs. 3400, not Rs. 3800. Hence, the total cost is found to rise less than proportionately to the increase in sales revenue. If the volume of production and sales decrease, there is a reverse effect. Thus, for 50 units the total cost will be Rs. (15 x 50) + 400 i.e. Rs. 1 150. It will not be half of Rs. 1900 (total cost of 100 units). In other words, the total cost decreases less than proportionately to the decrease in sales revenue.

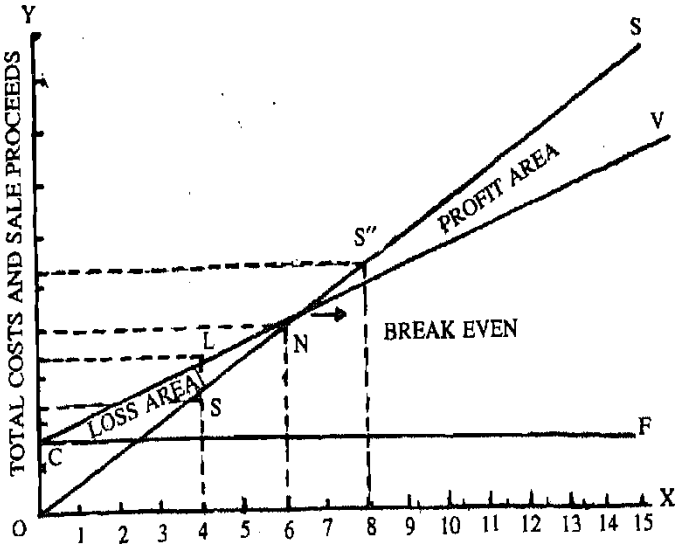
Further, suppose the selling price of the product per unit is fixed at Rs. 17. In that case, for each unit sold there will be a margin of Rs. 2 after meeting the variable cost of Rs. 15 . To recover the fixed cost of Rs. 400, the firm must sell at least 200 units. The total sale price (200 x Rs. 17) will then be equal to the total cost i.e. Rs. 3400.

Thus, sale of 200 units (or Rs. 3400 sales revenue) may be regarded as the volunle at which there is neither any profit nor any loss. This is known as the break-even volunle. It indicates thenumber of units that must be sold if the business is to be run without loss. Each unit of product sold above the break-even volume is expected to yield profit. If 250 units are sold, the profit earned will be Rs. 100 (50 x Rs. 2). This is because, the variable cost will increase by Rs. 15 per unit while sales revenue will rise by Rs. 17 per unit and there being no increase in fixed costs, there will be a margin of Rs. 2 per unit on 50 units as the profit.

The difference between the selling price and variable cost per unit is known as the contribution margin. The amount of this difference contributes towards the recovery of fixed costs. I-Ience, the break-even volume of sales in units can be calculated by dividing the total fixed cost by the contribution margin. In the above example, the contribution margin is Rs. 2 (Rs.17 - Rs. 15), and the fixed costs are Rs. 400. So, the break-even volume is Rs. 400 + 2 t.e. 200 units. On this basis, the break-even volume can be determined~by the formula: Break-Even Volume = Fixed Cost Contribution Margin per unil The break-even analysis is often carried out with the help of a chart. It is called break-even chart. This is a graphical representation of variable and fixed costs in relation to the volume of operation. The charvis described as break-even chart because there is a particular point in it, which breaks even the volume or shows the,particular volume at which there is neither profit nor loss but equality between total costs and total revenues from the operation. The figure below is a hypothetical break-even chart; the X-axis represents the volume of production in 100 kilograms unit; Y-axis, the total cost, as also the total sale proceeds; the line FC shows the (total) fixed cost; VC, variable cost; OS, the sale proceeds; and N the break-even point.

When the volume of production is 600 kgs., the total cost of production = total fixed cost + total variable cost = Rs. 1500 + Rs. 2500 (as read from lines FC and VC respectively) =Rs.4,000; total sale proceeds also = Rs. 4,000 (as indicated by

the line 0s). Thus, N is a point where total costs just equal sale proceeds. But when production is less, say 400 kgs., total cost corresponding to point L on VC is about Rs. 3,300 while total sale proceeds at point S' are about Rs. 2,600. This means a loss of about Rs. 700. On the other hand, when production is 800 kgs., total cost is about Rs. 5,000 and total sale proceeds at point S" on OS equal about Rs. 5,300. This means a profit of Rs. 300. Similarly, it may be shown that all production which is more than 600 kgs, yields profits and all production which is less, leads to loss.



Advantages The break-even analysis renders many benefits for managerial guidance and action: 1 Tool for profit planning and controlling: Cost, volume, price and product-mix being the four variables iffecting profit, planning and controlling of profit are better effected by the break-even analysis which shows the interplay and mutual relationship of these variables. 2 Basis for budgeting: As budgeting calls for marshalling anticipated costs and budgeted revenues for realising optimum profits, break-even analysis show the most profitable path for projecting budgets. 3 Objectivity in cost controlling: The break-even analysis introd~rces objectivity in cost control by indicating the way of controlling cost. Although changes in fixed costs affect the break-even point, it is not susceptible to control by managerial actions in the sh~rt run. 4 Indication of safety margin:

Break-even analysis not only points out the level of sales at which the company breaks even on expenses but it also indicates the extent of nearness of sales to the break-even point before they occur. By providing this information about the safety margin, management is warned for taking remedial actions.

Limitations The break-even analysis tends to be rigid due to certain limiting assumptions involved therein. Assumptions which underline the break-even analysis include the following: 1 Either one product is manufactured'or a group of products having the same volume and contribution margin are dealt in by the company. 2 Selling prices are not affected by the volume of operations and the general price level of the industry does not change. Techniques of Control 3 Variable costs vary directly with the volume of output and sales and fixed costs remain cmstant. Actually, variable costs may change more or less proportionately due to technical factors, and fixed costs may rise or fall in the long run. There is no time lag between production and sales and the entire production is sold out.

Let us now understand the various other drawbacks of a break-even analysis:

- It is a mere interpretation of the future by past business functions.
- Break-Even Analysis considers only cost and output for profit determination when management skills, market conditions, technological factors, etc. also affect the business.
- It is assumed that the selling price is constant, and the cost function is linear, which is not the case in reality.
- There exist no tax provisions in the break-even chart.
- Break-even analysis always relates cost to the output, which may not be the case every time.
- It may result in a poor analysis if the company lacks an efficient accounting system.
- The analysis considers that the price of output as per assumed horizontal demand curve, which is only possible under perfect competitions.
- It is not suitable for determining long-term profits due to the assumption of the linear relationship between cost, revenue and output since many other factors affect the business operations in the long run.

Using Break-Even Analysis for Day to Day Business Operations

Break-even analysis is not only used for taking strategical decisions but has also proved to be applicable in day to day business activities.

Let us now go through its following uses in business functions:

- **Goals**: Through the break-even analysis, the company can determine the number of units to be sold or sales revenue to be generated for reaching the break-even point.
- **Planning**: The further plans of expansion or growth can be set easily if the management knows what exactly is to be aimed.
- **Material**: Material management becomes easy with break-even analysis since the company decides to advance the cost and quality of material to be used as input.
- **New Product**: Break-even analysis is also used by the management for monitoring the performance of a new product.
- **Prices**: It is an essential tool for balancing the cost of a product and setting up a competitive price. For instance, if the price is low, it becomes difficult for the company to attain a break-even position on time.