Cost Volume Analysis (CPV analysis)

For:
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Introduction:

- A cost-volume-profit analysis can be used to measure the effect of factor changes and management decision alternatives on profits.
- These factors include possible changes in selling prices, changes in variable or fixed cost, expansion or contraction of sales volume, or other changes in operating methods or policies.
- Cost-volume profit analysis is also useful for problems of product pricing, sales-mix, adding or deleting product lines, and accepting special orders.
- CVP analysis also has a role in strategic positioning. A firm that has chosen to compete on cost leadership needs CVP analysis primarily at the manufacturing stage of the cost life cycle.
- The role of CVP analysis is to identify the most cost-effective manufacturing methods, including automation, outsourcing, and total quality management.
- In contrast, a firm following the differentia-tion strategy needs CVP analysis in the early phases of the cost life cycle to assess the profitability of new products and the desirability of new features for existing products.

Some situations where CVP analysis can be used are explained below:

I. Changes in Selling Prices:

The CVP graph is frequently used to illustrate the potential profit effect of contemplated price changes. A change in the selling price of a product changes its P/V ratio, which in turn has two effects on the profit pattern, first, a new break-even point is established, second, profits above and below the break-even sales volume are different.

Effects on the profit pattern are as follows:

1. Increase in Selling Price:

If the selling price is increased, it increases the P/V ratio, and the rate of fixed costs recovery is increased. The break-even point (break-even volume) declines, profits beyond the break-even point increases; losses below the break-even point decreases.

2. Decreases in Selling Price:

If the selling price decreases, it decreases the P/V ratio and the rate of fixed cost recovery declines. The break-even point moves at a higher point; profits beyond the break-even point decreases, losses below the break-even point increases.

II. Changes in Variable Costs:

The CVP graph is used to evaluate the impact of increases and decreases in variable costs per unit. Changes in variable cost change the P/V ratio, change the break-even point and affect profit and loss at different volumes.

The effects of changes in variable costs can be summarized as follows:

1. Increase in Variable Costs:

An increase in variable costs has the same effect as a decrease in the selling price. It decreases the P/V ratio and the rate of fixed cost recovery is slower. The break-even point moves to a higher level, profits after the break-even point decreases; losses before the break-even point increases.

2. Decrease in Variable Costs:

A decrease in variable costs has the same effect as an increase in the selling price. A higher P/V ratio is achieved and the rate of fixed costs recovery is increased. The break-even point declines; profits beyond the break-even point are higher; losses before the break-even point are lower.

III. Changes in Fixed Cost:

Increase and decrease in the fixed cost do not have any impact on the P/V ratio, but they change the break-even point.

With the same P/V ratio, the rate of the fixed costs recovery remains the same:

1. Increase in Fixed Costs:

If fixed costs are increased, the break-even point (break-even volume) is higher. Profits above the break-even point are lower by the amount of the increase in fixed costs; below the break-even point losses increase by the amount of increase.

2. Decrease in Fixed Costs:

If fixed costs are decreased, it lowers the break-even point. The profits are greater by the amount of the decrease, and losses are smaller by the amount of the decrease in fixed costs.

IV. Desired or Target Profit:

Sometimes, management faces two decisions: (i) to increase sales volume through reduction in selling prices, and (ii) to increase selling prices in case the P/V ratio is low, with the expectation that a higher profit will be earned. These decisions should be taken carefully after studying the profit pattern and other factors; otherwise the results can be harmful particularly for those companies whose

PA/ ratios are already low. Also, if reduction in selling prices does not increase the sales volume, the price reduction will result only in lower profits. Price cuts, like increase in variable unit costs, decrease the contribution margin. On a unit basis, price decreases may appear to be insignificant, but when the unit differential is multiplied by thousands of units, the total effect may be significant. Perhaps, many more units will have to be sold to make up the loss in profit or to earn a target profit.

V. Multi-Product Situations:

When there are multiple products with different contribution margins, the mix of the product has a direct effect on the fixed costs recovery and total profits of the firm. Different products have different P/V ratios because of different selling prices and variable costs. Some products make larger contributions to fixed cost recovery and profit than others. The total profits depends to some extent upon the proportions in which the products are sold.

VI. Sales Mix and Break-Even Point:

Sales mix is the relative proportion of each product line to the total sales of various products sold by an enterprise. As stated earlier, if there are no constraints or limitations, management should try to maximise the sales of the product (s) with higher P/V ratio. However, a sales mix results because there are limits to the quantities of any given product that can be produced and there may also be certain market limitations on how much can be sold.

VII. Desired Profit and Tax:

The amount of desired profit before income taxes is treated as if it were additional fixed costs in finding out the sales units or sales revenue required to give the amount of desired profit.

The usual formula is:

Desired sales units = Fixed cost + Profit before Tax/Contribution Margin per unit
Desired sales revenue = Fixed Cost + Profit before tax/P/V ratio

The amount of desired profit can be mentioned as a profit after income taxes. In such a case, the profit before tax is calculated by the following formula:
Profit before tax = Profit after tax/(1-tax rate)


Thank you