Marginal Cost

Introduction to Fixed and Variable Costs

Cost is something that can be classified in several ways depending on its nature. One of the most popular methods is classification according to fixed costs and variable costs. Classifying costs as either variable or fixed is important for companies because by doing so; companies can assemble a financial statement called the Statement/Schedule of Cost of Goods Manufactured (COGM). This is a schedule that is used to calculate the cost of producing the company’s products for a set period of time.

Fixed Costs - Fixed costs are those elements of cost which remain unaffected by change in the volume or the quantity produced. For example Administrative staff salary, rent, insurance, advertising cost, Depreciation, interest on loans etc. Fixed costs are also called period costs because the variation of fixed costs is in direct proportion to the passage of time.
Variable cost – Variable costs are those elements of cost, which are dependent on the volume of production. Major components of variable cost are material cost and labour cost. Other examples of variable cost are cost of packaging materials, shipping costs etc. The direct material and direct labor are often referred to as prime cost.

<table>
<thead>
<tr>
<th>Volume of Production (Units)</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fixed cost (Rs.)</td>
<td>100,000</td>
<td>100,000</td>
<td>100,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Fixed cost / Unit</td>
<td>1000</td>
<td>500</td>
<td>333</td>
<td>250</td>
</tr>
<tr>
<td>Variable cost per unit = Rs. 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Variable Cost (Rs.)</td>
<td>500</td>
<td>1000</td>
<td>1500</td>
<td>2000</td>
</tr>
</tbody>
</table>

By analyzing variable and fixed cost prices, companies can make better decisions on whether to invest in Property, Plant, and Equipment (PPE). For example, if a company incurs high direct labor costs in manufacturing their products, they may look to invest in machinery to reduce these high variable costs and incur more fixed costs instead.

These decisions, however, also need to consider how many products are actually being sold. If the company invested in machinery and incurred
high fixed costs, it would only be beneficial in a situation where sales are high enough so that the overall fixed costs are less than the total labor costs would have been had the machine not been purchased.

If sales were low, even though unit labor costs remain high, it would be wiser to not invest in machinery and incur high fixed costs because the high unit labor costs would still be lower than the overall fixed cost of the machinery.

**Semi-variable costs**

Some costs cannot be classified as either fixed or variable. These costs are known as *semi-variable costs* and they contain a fixed and a variable cost element. These costs are also called *mixed costs* or *semi-fixed costs*. These costs may change but not in direct proportion to changes in activity. Although semi-variable costs are neither wholly fixed nor wholly variable in nature, they must ultimately be separated into fixed and variable components for the purpose of planning and control. Examples of semi-variable cost include Telephone charges, Electricity charges, repairs etc.
Marginal Cost

Marginal costing is a very useful technique of costing for decision making. Marginal costing is one of the important financial tools, which helps the finance manager to study the behavior of cost and its impact on the profitability of an organization.

**Marginal cost is the change in the total cost of production when an additional unit of product is produced.** That is, it is the cost of producing one more unit of a good.

For example, let us suppose:

Variable cost per unit = Rs 25  
Fixed cost = Rs 1, 00,000

Total Cost of 10,000 units = Total Fixed Cost + Total Variable Cost  
= 1, 00,000 + 2, 50,000  
= Rs 3, 50,000

Total cost of 10,001 units = 1, 00,000 + 2, 50,025  
= Rs 3, 50,025

Marginal Cost  
= 3, 50,025 – 3, 50,000  
= Rs 25

**Marginal costing** refers to the method of costing which is concerned with changes in costs resulting from changes in the volume. The marginal cost of an item is its variable cost. Note that variable costs are those which change as output changes - these are treated under **marginal costing** as costs of the product. Fixed costs, in this system, are treated as costs of the period. Under marginal costing we are concentrating on
variable cost because any additional production will be beneficial only if additional revenue exceeds variable cost.

**Marginal Costing** is a technique that assumes only variable costs as product costs. Variable cost is considered as product cost and fixed cost is assumed as cost for the period.

**Absorption Costing** is a technique that assumes both fixed costs and variables costs as product costs.

From this approach, it is not possible to identify an amount of net profit per product, but it is possible to identify the amount of contribution per product towards fixed overheads and profits. The **contribution** concept lies at the heart of **marginal costing**. The contribution is the difference between sales volume and the marginal cost of sales.

<table>
<thead>
<tr>
<th>Volume / Units produced</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>125</th>
<th>150</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Price</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>1250</td>
<td>1500</td>
<td>2000</td>
</tr>
<tr>
<td>Variable Cost</td>
<td>60</td>
<td>120</td>
<td>180</td>
<td>7500</td>
<td>9000</td>
<td>12000</td>
</tr>
<tr>
<td>Contribution</td>
<td>40</td>
<td>80</td>
<td>120</td>
<td>5000</td>
<td>6000</td>
<td>8000</td>
</tr>
<tr>
<td>Fixed Cost</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
</tr>
<tr>
<td>Net Profit / Loss</td>
<td>-4960</td>
<td>-4920</td>
<td>-4880</td>
<td>0</td>
<td>1000</td>
<td>3000</td>
</tr>
<tr>
<td>P/V Ratio</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

Contribution = Selling price – Variable cost

Profit / Loss = Contribution – Fixed cost
In marginal costing it is not possible to determine the profit per unit of product because fixed overheads are charged in total to the profit and loss account rather than recovered in product costing. Contribution is a pool of amount from which total fixed costs will be deducted to arrive at the profit or loss.

The idea of profit is not a particularly useful one as it depends on how many units are sold. For this reason, the contribution concept is frequently employed by management accountants.

- Contribution gives an idea of how much 'money' there is available to 'contribute' towards paying for the overheads of the organization.
- At varying levels of output and sales, contribution per unit is constant.
- At varying levels of output and sales, profit per unit varies.
- Valuation of inventory - opening and closing inventory are valued at marginal (variable) cost under marginal costing.
- The fixed costs actually incurred are deducted from contribution earned in order to determine the profit for the period.

**Profit Volume Ratio (P/V ratio):**

\[
P/V \text{ ratio} = \frac{\text{Contribution}}{\text{Sales}}
\]

\[
= \frac{(\text{Total Sales} - \text{Total Variable Cost})}{\text{Total Sales}}
\]

\[
= \frac{(\text{Fixed cost} + \text{Profit})}{\text{Sales}}
\]

\[
= \frac{\text{Change in Contribution}}{\text{Change in Sales}}
\]

\[
= \frac{\text{Change in Profit}}{\text{Change in Sales}}
\]
Q. which of the following is not a fixed cost?
(a) Insurance  (b) Depreciation
(c) Prime Cost  (d) Interest on loans

Q. Total variable cost
(a) Remains constant
(b) Changes with volume of production
(c) Decreased with increase in production
(d) None of the above

Q. Marginal costing
(a) Assumes fixed cost as product cost
(b) Assumes fixed cost is not a cost for the period
(c) Assumes both fixed cost and variable cost as product costs
(d) Assumes variable cost as product cost

Q. Profit- Volume ratio can be defined as
(a) Profit / Sales
(b) (Fixed cost - Profit) / Sales
(c) (Fixed cost + Profit) / Sales
(d) None of the above