SUBJECT: STRATEGIC COST ANALYSIS

Module 3: Decision Making with Management Accounting Information

15 Marginal Costing- Concept-Meaning

Marginal Costing is a specialized management accounting technique where only variable costs (direct materials, direct labor, direct expenses, and variable overheads) are charged to production cost units. Fixed costs are completely excluded from product valuation; instead, they are treated as period costs and written off entirely against the aggregate contribution of the financial period.

Core Characteristics & Philosophy

Unlike traditional Absorption Costing, which allocates fixed factory overheads to product units via estimation, Marginal Costing treats fixed costs as sunk or static expenses linked directly to the passage of time rather than the volume of manufacturing execution. It focuses heavily on **Contribution**—the financial surplus generated by sales revenue over variable expenses—to assess operational health.

Key Operational Assumptions of Marginal Costing

- **Strict Cost Segregation:** All elements of corporate expenditure can be accurately bifurcated into perfectly fixed and perfectly variable parameters.
- **Linear Variable Scaling:** Variable cost per unit remains constant across all production scales, meaning total variable cost increases in direct linear proportion to output volume.
- **Fixed Price Stability:** Total fixed costs remain unchanged across the entire specified operational capacity grid.
- **Constant Selling Price:** The unit selling price stays identical across all transaction quantities, ignoring volume discounts or market shifts.

16 Computation of contribution, PV ratio, Margin of Safety

Strategic financial evaluation relies on key mathematical benchmarks to determine product pricing models and break-even points.

1. Contribution

Contribution represents the financial cushion available to cover total fixed corporate overheads. Once fixed expenses are fully recovered, any additional contribution generated translates directly into net company profit.

CONTRIBUTION EQUATIONS

$$\text{Contribution} = \text{Sales Revenue} - \text{Variable Costs}$$

$$\text{Contribution} = \text{Fixed Costs} + \text{Profit}$$

2. Profit-Volume (P/V) Ratio

The P/V Ratio (or Contribution-to-Sales Ratio) is the percentage of sales revenue that contributes to recovering fixed costs and generating net profits. It serves as an essential metric for measuring product profitability.

PROFIT-VOLUME (P/V) RATIO FORMULAS

$$\text{P/V Ratio} = (\text{Contribution} / \text{Sales}) \times 100$$

$$\text{P/V Ratio} = (\text{Change in Profit} / \text{Change in Sales}) \times 100$$

3. Break-Even Point (BEP)

The Break-Even Point represents the precise scale of operations where an enterprise incurs zero net profit and zero net loss because total sales revenue exactly equals total operational costs. At this point, total contribution precisely equals total fixed costs.

BREAK-EVEN POINT (BEP) EQUATIONS

$$\text{BEP (in Units)} = \text{Total Fixed Costs} / \text{Contribution per Unit}$$

$$\text{BEP (in Value)} = \text{Total Fixed Costs} / \text{P/V Ratio}$$

4. Margin of Safety (MoS)

The Margin of Safety represents the volume of sales execution that exceeds the calculated break-even point. It serves as a vital risk metric, indicating how much sales revenue can decline before the organization enters a net operating loss zone.

MARGIN OF SAFETY (MOS) EQUATIONS

$$\text{Margin of Safety} = \text{Actual Sales} - \text{Break-Even Sales}$$

$$\text{Margin of Safety (Value)} = \text{Net Profit} / \text{P/V Ratio}$$

Illustrative Practical Problem & Solution

Problem Statement: A company manufactures a specialized digital component with the following financial parameters:

• Selling Price: ₹100 per unit | Variable Cost: ₹60 per unit | Total Fixed Costs: ₹40,000

• Actual Sales Target: 1,500 units (Value: ₹1,50,000)

Compute: Contribution per Unit, P/V Ratio, Break-Even Point (Units & Value), and the Margin of Safety.

Step-by-Step Analytical Solution

Metric Benchmark	Mathematical Execution & Final Value
Contribution per Unit	₹100 Selling Price – ₹60 Variable Cost = **₹40 per unit**
Profit-Volume (P/V) Ratio	(₹40 Contribution / ₹100 Sales) × 100 = **40%**
Break-Even Point (Units)	₹40,000 Fixed Costs / ₹40 Unit Contribution = **1,000 Units**
Break-Even Point (Value)	₹40,000 Fixed Costs / 0.40 P/V Ratio = **₹1,00,000**
Margin of Safety (Units)	1,500 Actual Units – 1,000 Break-Even Units = **500 Units**

Metric Benchmark	Mathematical Execution & Final Value
Margin of Safety (Value)	₹1,50,000 Actual Revenue – ₹1,00,000 BEP Revenue = **₹50,000**

17 BEP- Construction of Break-Even Chart

A Break-Even Chart provides a visual representation of the relationship between total costs, sales volume, and net profits. It illustrates the financial impacts and breakeven thresholds across various scales of output.

Core Structural Elements of a Break-Even Chart

1. The Axes Parameters: The horizontal axis (X-axis) represents production volume, measured in output units or percentage plant capacity. The vertical axis (Y-axis) maps monetary values, representing both revenue and costs.

2. The Fixed Cost Line: Drawn parallel to the X-axis starting from the fixed cost milestone on the Y-axis. It remains horizontal, reflecting that fixed costs do not change regardless of production volume.

3. The Total Cost Line: Starts at the fixed cost point on the Y-axis and slopes upward in a linear path. This angle reflects the addition of variable costs as production volume increases.

4. The Total Sales Revenue Line: Starts at the absolute origin point (zero volume, zero revenue) and projects upward at a steep linear angle, reflecting sales growth.

Key Graphic Interpretation Areas

- **The Intersection Point (BEP):** The exact point where the Total Sales Revenue Line intersects the Total Cost Line. Projecting a line straight down to the X-axis yields the break-even units, while a horizontal line to the Y-axis indicates the break-even value.

- **The Angle of Incidence:** The angle formed at the intersection point where the sales revenue line crosses above the total cost line. A larger angle indicates a high rate of profit generation once the break-even threshold is crossed, whereas a shallow angle suggests lower margins.
- **The Loss & Profit Zones:** To the left of the break-even point lies the Loss Triangle (where the total cost line sits above the revenue line). To the right lies the Profit Triangle (where the revenue line rises above total costs).

18 Cost Volume Profit Analysis

Cost-Volume-Profit (CVP) Analysis is a comprehensive framework used by management accountants to analyze how changes in output volumes, unit selling prices, variable costs, and fixed overheads affect the company's net operating profit.

Strategic Managerial Decisions Guided by CVP Analysis

CVP analysis provides the data-driven framework required to evaluate and execute complex business decisions:

- **1. Pricing Decisions During Market Recessions:** Helps determine the absolute minimum floor price a product can be sold at to maintain a positive contribution margin and sustain factory operations during economic downturns.
- **2. Make or Buy Decisions:** Guides management on whether to manufacture a component internally using open factory capacity or outsource production to an external vendor by comparing the vendor's price against the internal Marginal Cost of Production, ignoring fixed overhead absorption.
- **3. Selection of Optimal Product Mixes:** When an enterprise operates under resource constraints (key factor limitations like raw material shortages or limited machine hours), CVP analysis helps optimize profitability by prioritizing products that yield the highest Contribution per Unit of the Limiting Factor.
- **4. Capital Expansion Decisions:** Models the financial viability of acquiring automated plant machinery, balancing higher fixed depreciation costs against the projected drop in manual unit variable labor costs.

End of Module 3 • Decision Making with Management Accounting Information