

Cost-Volume-Profit Analysis of Gayathri Mills, Palakkad

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Abstract- *This paper presents a comprehensive Cost-Volume-Profit (CVP) analysis of Gayathri Mills, located in Palakkad, which is engaged in manufacturing products within the agricultural and textile sectors. The primary objective of this study is to assess the company's cost behavior and evaluate how various cost factors affect the overall profitability.*

The CVP analysis includes a detailed examination of the company's fixed and variable costs, contribution margin, and the break-even point. It also evaluates how changes in sales volume, product pricing, and cost structure can influence the net operating income. By categorizing the expenses and assessing their variability with respect to production output, the analysis provides a strong foundation for managerial decisions on pricing, budgeting, and expansion planning.

Through break-even and target profit analysis, the study highlights the level of sales required to avoid losses and identifies the sales threshold necessary to achieve specific profit goals. This research is vital in enabling Gayathri Mills to implement cost control measures and pricing strategies that can lead to enhanced profitability and long-term sustainability.

Keywords- CVP analysis, break-even point, contribution margin, fixed costs, variable costs, cost behavior, financial planning, pricing strategies, target profit analysis, operating income, textile manufacturing, agricultural industry

I. INTRODUCTION

This project undertakes a comprehensive Cost-Volume-Profit (CVP) analysis of Gayathri Mills, a prominent rice mill located in Vadavannur, Palakkad, as a culminating endeavour for the Master of Business Administration (MBA) program. CVP analysis, a fundamental tool in managerial accounting, allows businesses to understand the intricate relationships between costs, sales volume, and profitability, enabling informed decision-making.

Gayathri Mills, operating within the competitive and often volatile rice milling industry, faces numerous challenges, including fluctuating paddy prices, seasonal demand variations, and the need for efficient cost management. This project aims to utilize CVP analysis to evaluate the operations of Gayathri Mills by breaking down its cost structure into fixed and variable components. The objective is to determine key financial indicators such as the break-even point, contribution margin, and margin of safety. This analysis will offer insights into the mill's financial stability and operational effectiveness. Additionally, it will assess how variations in critical factors affect the mill's profitability, enabling the formulation of practical recommendations to improve resource efficiency and enhance strategic decision-making. By integrating financial data analysis, this study will connect theoretical CVP principles with their practical implementation in the context of a rice mill.

By applying CVP principles to Gayathri Mills, this project aims to delve into the practical implications of this analysis, exploring how it can illuminate the mill's financial performance, identify areas for operational optimization, and ultimately contribute to strategic decision-making. Through a detailed examination of Gayathri Mills' cost structure, sales data, and production volumes, this study seeks to provide a comprehensive understanding of the mill's financial landscape, offering actionable recommendations to enhance its competitive edge and ensure long-term viability. This analysis will not only serve to demonstrate the practical application of CVP concepts within a real-world scenario but also provide Gayathri Mills with valuable insights to improve its overall financial performance.

II. COMPANY PROFILE

Gayathri Rice Mills is a traditional rice mill located in Vadavannur, Palakkad, Kerala. The mill was founded in 1963 by Mr. K.P. Gopalakrishnan, who had a passion for rice and a desire to provide the best quality rice to his customers. The mill has been family-owned and operated ever since, and it has grown to become one of the most respected rice mills in Kerala. Gayathri Rice Mills is known for its high-quality rice,

which is produced using traditional methods and modern equipment. The mill uses only the finest raw materials, and it has a strict quality control process in place to ensure that the rice is always of the highest quality. Gayathri Rice Mills offers a wide variety of rice products, including white rice, brown rice, parboiled rice, and broken rice. The mill also produces a variety of specialty rice products, such as matta rice, samba rice, and ponni rice. All of Gayathri Rice Mills' products are gluten-free and vegan.

III. REVIEW OF LITERATURE

Hornrgren et al. (2023) - *Cost Accounting: A Managerial Emphasis* - The latest edition of this renowned text presents a comprehensive analysis of CVP analysis as a crucial tool for strategic decision-making. It covers fundamental concepts such as contribution margin, break-even analysis, and margin of safety, emphasizing their interconnections and practical relevance. The authors highlight how a clear understanding of the contribution margin enables managers to assess the impact of changes in sales volume, pricing strategies, and cost variations on overall profitability.

Kaplan (2023) - *CVP Analysis and Risk Assessment in Agricultural Businesses: Managing Uncertainty and Volatility* - This study examines how CVP analysis serves as an effective tool for managing risk in agricultural businesses, where external factors such as commodity price fluctuations, unpredictable weather, and market demand volatility introduce considerable uncertainties. Kaplan illustrates that by thoroughly analyzing the contribution margin and break-even sales, farmers and agribusiness managers can make more informed decisions about production volumes, pricing strategies, and cost management.

Andersen & Black (2023) - *CVP Analysis in the Digital Age: Integrating Technology for Enhanced Decision-Making in Agriculture* - This paper explores the changing role of CVP analysis in modern agriculture, emphasizing the integration of digital tools to enhance decision-making. Andersen and Black suggest that real-time data tracking, facilitated by IoT devices and cloud computing, enables managers to monitor variable and fixed costs with exceptional accuracy. This digital advancement improves the accuracy of CVP calculations, allowing farmers to adapt their strategies dynamically to changing market conditions.

IV. PROBLEM STATEMENT

Gayathri Mills, an agricultural processing unit, faces challenges in managing costs, determining optimal production volumes, and setting profitable pricing strategies amid

fluctuating market conditions and variable production costs. Without a systematic understanding of the cost-volume-profit relationship, the mill may struggle to make informed decisions that maximize profitability and ensure sustainable growth. This study aims to address these challenges by applying CVP analysis to identify critical cost behaviors, break-even points, and profit-maximizing strategies.

V. RESEARCH METHODOLOGY

OBJECTIVES OF THE STUDY

Primary objective:

- To understand the relationship between costs, sales volume, and profits at Gayathri Mills.

Secondary objectives:

- To understand about the Contribution Margin and P/V Ratio Analysis.
- To calculate the break-even point where total revenue equals total costs.
- To support strategic decision-making based on CVP analysis.

The study employs a Descriptive analysis combined with a Quantitative approach, as it aims to analyze historical financial data, cost components, and production volumes to understand their impact on profitability.

- Historical Data: Financial and production data from the past 5 years (2019–2023).
- Financial Documents: Income statements, balance sheets, cash flow statements, and cost reports for the years 2019–2023.

DATA COLLECTION METHODS

Secondary data will be used extensively in research which provide historical and contextual information for trend analysis and benchmarking.

- Financial Statements: Profit & loss accounts, balance sheets, and cost sheets for the period 2020–2024.
- Production & Sales Records: Data on units produced, units sold, and raw material usage.
- Sales Records: Detailed sales data, including product-wise revenue, quantity sold, and pricing history over the past five years.

- Costing Reports: Variable and fixed cost breakdowns, production expense logs, and raw material cost records.

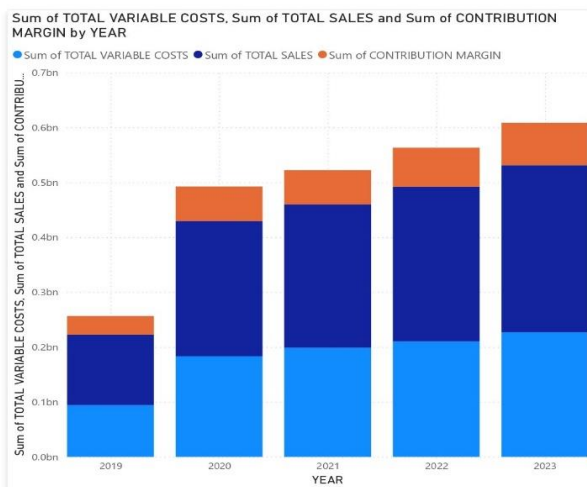
VI. DATA ANALYSIS

1. CONTRIBUTION MARGIN ANALYSIS

Table No:1- Table showing Contribution Margin Analysis

YE AR	TOTA L SALE S	TOTAL VARIA BLE COSTS	CONTRIBU TION MARGIN	CONTRIBU TION MARGIN RATIO
2019	128251830	94201892	34049938	26.55%
2020	246167965	183254290	62913675	25.56%
2021	261080289	198723450	62356839	23.88%
2022	281572630	210324580	71248050	25.30%
2023	304219780	226894320	77325460	25.40%

Chart No: 1- Chart showing Contribution Margin Analysis



INTERPRETATION:

This chart shows the Total Variable Costs, Total Sales, and Contribution Margin from 2019 to 2023. It shows steady growth, with sales rising from ₹128.25 million in 2019 to ₹304.22 million in 2023. While variable costs increased from ₹94.20 million to ₹226.89 million, they remained under control. The contribution margin improved from ₹34.05

million to ₹77.33 million, indicating higher earnings after covering variable costs. Despite slight changes, the contribution margin ratio stayed stable, moving from 26.55% in 2019 to 25.40% in 2023, reflecting consistent profitability.

From the data we can interpret that the company showing:

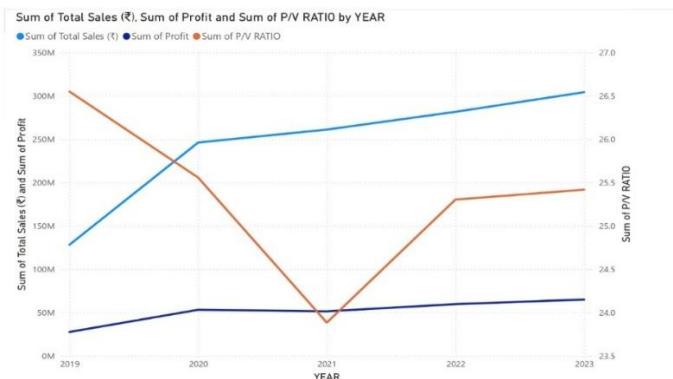
- Positive Growth:** Sales and contribution margin are increasing, showing business expansion and better profit potential.
- Stable Cost Management:** Although variable costs are rising, they aren't eating into profits excessively, suggesting good cost control.
- Stronger Profitability:** A widening contribution margin indicates that a larger portion of revenue is available to cover fixed costs and increase profitability.

2. PROFIT VOLUME RATIO ANALYSIS

Table no: 2- Table showing Profit Volume Ratio Analysis

YEAR	Total Sales (₹)	Total Variable Costs (₹)	Contribution	Total Fixed Costs (₹)	Profit	% Change in Profit	PV ratio	BEP Sales
2019	128251830	94201892	34049938	6431314	27618624		26.54928043	242240.6143
2020	246167965	183254290	62913675	9682470	53231205	92.74%	25.55721456	378854.6665
2021	261080289	198723450	62356839	10894300	51462539	-3.32%	23.88416193	456130.7209
2022	281572630	210324580	71248050	11512460	59735590	16.08%	25.30361349	454972.9628
2023	304219780	226894320	77325460	12268540	65056920	8.91%	25.41763064	482678.3494

Chart No:2 - Chart Showing P/V Ratio Analysis



INTERPRETATION:

This chart shows the relationship between Total Sales, Profit, and the P/V Ratio over time. By sales increasing consistently each year, Profits have also risen but at a slower pace, possibly due to rising costs or the need for better cost management. The P/V ratio, which shows how much of the sales contribute to covering costs and profit, dropped sharply between 2019 and 2021, likely due to higher variable costs or

pricing issues. However, it recovered and stabilized from 2021 to 2023, suggesting improved cost control or better pricing strategies.

From the data we can interpret that the company showing:

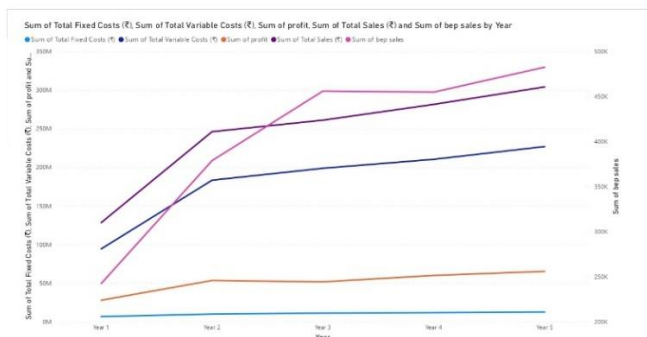
- The company successfully boosted sales and profit after 2021, but improving the P/V ratio further could accelerate profit growth.
- The 2021 dip could have been due to higher variable costs or a temporary market challenge, but the quick recovery shows adaptability.
- Maintaining a higher P/V ratio would strengthen profit margins and enhance financial performance.

3. BREAK-EVEN ANALYSIS

Table No: 3 – Table showing Break-Even Analysis

Year	Total Sales (₹)	Total Variable Costs (₹)	Total Fixed Costs (₹)	BEP SALES	PROFIT
Year 1	128251830	94201892	6431314	242240.6143	27618624
Year 2	246167965	183254290	9682470	378854.6665	53231205
Year 3	261080289	198723450	10894300	456130.7209	51462539
Year 4	281572630	210324580	11512460	454972.9628	59735590
Year 5	304219780	226894320	12268540	482678.3494	65056920

Chart No:3 - Chart showing Break-Even Analysis



INTERPRETATION:

This chart shows the trends in Fixed Costs, Variable Costs, Profit, Total Sales, and Break-even Sales (BEP) over a 5-year period.

The company shown steady sales growth over time, indicating positive business progress. As variable costs have increased along with sales, fixed costs also increasing with production. Profits rise significantly in the early years and then stabilized, suggesting that the company is earning higher margins as sales grow faster than costs. The break-even sales point has also increased slightly, which means that although costs are rising, the business is maintaining a safe margin above the break-even level.

From the data we can interpret that the company showing:

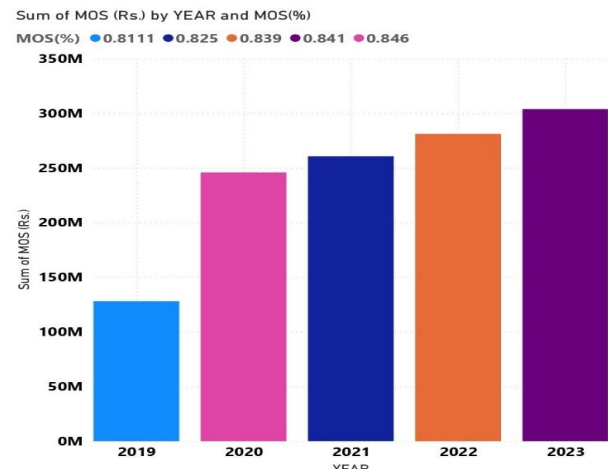
- Profitability Growth: The gap between total sales and total costs is widening, showing improving profits over time.
- Cost Management: The flat fixed costs and controlled rise in variable costs suggest good cost management.
- Healthy Break-even Point: BEP sales growing slowly indicates the business is expanding while keeping enough sales volume to cover costs and stay profitable.

4. MARGIN OF SAFETY ANALYSIS

Table No: 4 – Table showing Margin of Safety Analysis

YE AR	ACT UAL SALE S	BREA K EVEN SALES	PRO FIT	P/V RA TIO	MOS (Rs.)	MO S (%)
2019	128251830	242240.6143	27618624	26.5493	128009589	81.11%
2020	246167965	378854.6665	53231205	25.5572	245789110	84.60%
2021	261080289	456130.7209	51462539	23.8842	260624158	82.50%
2022	281572630	454972.9628	59735590	25.3036	281117657	83.90%
2023	304219780	482678.3494	65056920	25.4176	303737102	84.10%

Chart No: 4- Chart showing margin of safety analysis



INTERPRETATION:

This chart shows the Margin of Safety (MOS) in Rs. over the years, along with the MOS percentage.

The company has steadily increased its margin of safety (MOS) from 2019 to 2023, meaning it is generating more sales above the break-even point, giving the business a stronger safety buffer. The MOS percentage also improved from 81.1% in 2019 to 84.6% in 2023, showing that a larger share of sales is contributing to profit after covering costs. This rising MOS makes the company more financially stable and less likely to face losses even if sales drop.

From the data we can interpret that the company showing:

- **Controlled Cost Management:** Variable costs have risen with production, while fixed costs remained constant.
- **Improved Profit Margins:** Profits have increased and stabilized, suggesting better margins as sales outpace costs.

VII. FINDINGS AND SUGGESTIONS**FINDINGS**

- Total sales increased steadily from ₹128.25 Cr in 2019 to ₹304.22 Cr in 2023, showing continuous business expansion.
- Despite fluctuations, the contribution margin grew from ₹34.05 Cr to ₹77.33 Cr, indicating better revenue retention after covering variable costs.
- Variable costs rose with sales, but the contribution margin ratio stayed relatively steady, suggesting controlled cost increases.
- Profits increased significantly, with only a small dip in 2021, showing resilience and eventual growth.
- BEP sales increased slowly, meaning the business consistently stayed well above the break-even level, reducing risk.
- The MOS value and percentage grew consistently, from 81.11% in 2019 to 84.10% in 2023, showing the business could handle sales declines without losses.
- A rising MOS indicates strong financial stability, giving the company room to invest, expand, or withstand market volatility.

- The ratio dropped from 2019 to 2021, likely due to rising variable costs or pricing issues, but recovered and stabilized by 2023.
- The quick recovery of the P/V ratio after 2021 shows the company's agility in adjusting costs or pricing to restore profitability.
- While profit is growing, maintaining or increasing the P/V ratio could accelerate profit growth.
- Even tighter control over variable costs could further enhance margins.
- With growing profits, stable fixed costs, and a high MOS, the company is well-positioned for future growth, reinvestment, or new market opportunities.

VIII. SUGGESTIONS

- Despite rising sales and profits, fluctuating contribution margins and a dipping P/V ratio (2019–2021) suggest underlying cost or pricing issues.
- Since rising variable costs affected the contribution margin, the study could explore cost drivers and opportunities for reduction.
- Analyse and streamline production processes to minimize variable costs, ensuring a higher contribution margin and sustained profitability.
- Regularly monitor pricing strategies and variable cost trends to protect and enhance the P/V ratio, maintaining profit stability.
- Leverage the consistently high margin of safety to explore growth opportunities, expand operations, or invest in new ventures without risking profitability.
- Use the rising profits to invest in technology, automation, and market diversification to enhance efficiency and revenue potential.
- Continuously evaluate the break-even sales level to ensure that the business remains well above this point, reducing financial risk.
- Explore new product lines or enter related markets to diversify revenue streams and mitigate dependency on existing offerings.
- Establish stronger supplier relationships and explore alternative sources to negotiate better pricing and reduce cost volatility.
- Maintain control over fixed costs to ensure that growing sales translate directly into increased profits.

IX. CONCLUSION

The Cost-Volume-Profit (CVP) analysis of Gayathri Mills, Palakkad, offers critical insights into the company's financial performance, cost structure, and overall profitability. The study indicates that although total sales have steadily increased over the years, profit growth has lagged slightly, reflecting the impact of rising costs. Analyzing the Contribution Margin and Profit/Volume (P/V) Ratio revealed fluctuations, with a notable decline in the P/V ratio around 2021, possibly due to increased variable costs or market disruptions. However, the company's ability to recover and stabilize the ratio in subsequent years highlights its adaptability and sound strategic decisions.

The Break-Even Point (BEP) analysis showed that Gayathri Mills has consistently maintained sales above the break-even level, ensuring profitability and reducing financial risk. Additionally, the Margin of Safety (MOS) has progressively increased, indicating a growing buffer between actual sales and break-even sales, further strengthening the company's financial stability. These findings suggest that while Gayathri Mills is on a positive growth trajectory, focusing on optimizing variable costs, improving production efficiency, and exploring effective pricing strategies could further enhance profit margins.

Overall, the CVP analysis underscores the company's resilience, growth potential, and the importance of continuous cost management and strategic planning to sustain long-term profitability and maintain a competitive edge in the market.

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