Anusandhanvallari
Vol 2024, No.1
June 2024
ISSN 2229-3388

Performance analysis of Sugar Industries in Karnataka

[1]Dr. Vijayalakshmi . G, [2]Manjunatha M K
[1]Assistant Professor of Economics,
Maharanis Arts College for Women, Mysore
[2]Assistant Professor, Department of Economics
Government First Grade College, Hirisave -573124
Channarayapattana Taluk, Hassan District

Abstract

This research assesses the financial performance of Karnataka's sugar sector during the years 2016–17 to 2022–23. Employing essential financial ratios—Return on Capital Employed (ROCE), Net Profit Margin (NPM), Current Ratio, and Debt-to-Equity Ratio—together with operational indicators, the study explores the industry's growth path and fiscal well-being. The assessment employs statistical methods such as Compound Annual Growth Rate (CAGR) and Linear Regression to evaluate the hypothesis of enhanced profitability. The findings indicate a notable positive trend in profit margins and financial soundness, pointing to structural enhancements and greater efficiency within the industry.

Key words: Sugar Industry, Karnataka, ROCE, Net Profit Margin, Financial Performance

I. Introduction

The sugar sector plays a crucial role in India's agriculture-driven economy, and Karnataka has become one of the top sugar-producing states in the nation. As a major player in agricultural and industrial fields, Karnataka's sugar industry has been vital for rural growth, job creation, and industrial diversification through related processes such as ethanol production and electricity co-generation. Throughout the years, the economic stability of sugar mills in Karnataka has faced examination owing to changing sugarcane prices, policy actions, increasing production expenses, and instability in the global market. In turn, the sector has placed greater emphasis on enhancing operational productivity, managing costs, and diversifying revenue—especially via ethanol blending initiatives encouraged by the government.

Assessing financial performance has thus become critical for grasping the sustainability and profitability of this important sector. Crucial financial metrics like Return on Capital Employed (ROCE) and Net Profit Margin (NPM) have proven to be dependable indicators for evaluating the sector's capability to yield returns for stakeholders and utilize its resources efficiently. Likewise, metrics such as the Current Ratio and Debt-to-Equity Ratio have offered perspectives on the liquidity and solvency status of sugar companies. Numerous national-level studies have evaluated the financial sustainability of the sugar sector, but there has been minimal research focused specifically on the historical performance of Karnataka's sugar industry. This void has required a concentrated examination of the financial patterns in the state, employing empirical data and statistical methods.

This research has sought to assess the financial performance of Karnataka's sugar industry from 2016–17 to 2022–23. It has evaluated trends in profitability, liquidity, and capital structure by employing various financial ratios and operational metrics. Moreover, it has utilized statistical techniques to assess if the observed enhancements in financial metrics are statistically meaningful. The results aim to educate industry stakeholders, policymakers, and researchers regarding the financial path and future outlook of the sugar sector in Karnataka.

II. Review of Literature

Ganeshgouda I Patil, S. B. Mahajanashetti, & Somanagouda I Patil (2017).*Financial Performance of Sugar Factories in Karnataka State*. This study has assessed the financial health of sugar factories in Karnataka, distinguishing between public, cooperative, and private sectors. By analyzing financial ratios such as Return on Investment (ROI), Current Ratio, and Debt-to-Equity Ratio, the authors have found that private and cooperative factories have generally performed better than public units. The research emphasizes the importance of efficient financial management and the role of operational discipline in achieving sustainable performance.

Badri Narayan Misra (2012), *Financial Performance of Selected Sugar Companies: An Econometric Analysis*. This thesis has provided an **econometric evaluation** of 23 sugar companies listed in the Indian stock market from 2005–06 to 2009–10. Using CAGR, factor analysis, and profitability metrics**,** the study has revealed significant variation in financial performance across firms. Companies with higher asset utilization and stronger equity positions showed better profitability and sustainability. The findings have broader implications for policy support and financial restructuring, particularly in states like Karnataka where the sugar sector plays a pivotal economic role.

Nagaraj Godihalkar (2012),*Business Performance Analysis of Sugar Factory: A Study of Malaprabha Sahakari Sakkare Karkhane* .This case study has focused on the Malaprabha Sahakari Sakkare Karkhane in Karnataka to examine business and financial performance. It has applied financial ratio analysis and trend analysis to assess profitability, liquidity, and operational efficiency. The study concludes that cooperative mills face challenges in capital utilization and operational efficiency**,** often due to delayed payments, political interference, and lack of working capital. The findings highlight the need for professional financial governance and modernization to improve long-term viability.

Yasmeen Yasmeen, Suresh S. Patil, G. M. Hiremath, & B. S. Reddy (2018), *Performance Analysis of Cooperative Sugar Factories in North-Eastern Karnataka*. This study has analyzed the economic performance of three cooperative sugar factories in North-Eastern Karnataka over several years. It has considered cost structures, capacity utilization, return on assets, and cane procurement efficiency**.** The authors have observed that while some factories are operating above capacity, many suffer from high fixed costs, poor working capital cycles, and excessive debt. Recommendations include technological upgrades, better financial planning, and timely cane payments to farmers.

Aishwarya S. P., Mahantesh R. Nayak, B. R. Jamakhandi, Chadana B.M, & Sushma Purada (2025),*Financial Viability in Sugarcane Farming in Karnataka, India: A Comparative Study of Natural and Conventional Farming Approaches*. Though focused primarily on sugarcane farming rather than industrial performance, this study offers valuable insights into the input-output economics of sugar production. It compares the financial viability of natural farming vs. conventional farming methods, indicating that natural farming practices can be more cost-effective and environmentally sustainable. The implications for the sugar industry are indirect but important—lower input costs and stable supply chains can enhance mill profitability and operational resilience**.**

III. Objectives of the Study

1. To analyze the trends in financial performance indicators of the sugar industry in Karnataka from 2016–17 to 2022–23.

2. To evaluate whether there is a statistically significant improvement in profitability over the years in terms of ROCE and Net Profit Margin.

IV. Hypothesis of the Study

- **Null Hypothesis (H_0):** There is no significant improvement in profitability (ROCE and NPM) of the sugar industry in Karnataka over the period 2016–17 to 2022–23.
- **Alternative Hypothesis (H_1):** There is a significant improvement in profitability (ROCE and NPM) of the sugar industry in Karnataka over the period 2016–17 to 2022–23.

V. Research Methodology

1. Data Source

The study is based on secondary data derived from industry averages representing Karnataka's sugar mills over seven financial years (2016–17 to 2022–23). The dataset includes financial ratios, profit/loss indicators, and production figures.

2. Variables Used

- **Profitability Ratios**: Return on Capital Employed (ROCE), Net Profit Margin (NPM), Operating Profit Margin.
- **Solvency & Liquidity**: Current Ratio, Debt-to-Equity Ratio.
- **Financials**: Revenue, Net Profit, Operating Profit.
- **Operational Metrics**: Sugarcane Crushed, Sugar Produced, Ethanol Production.

3. Statistical Tools Applied

- **Compound Annual Growth Rate (CAGR)**: Used to measure the annual growth of key financial metrics.
- **Linear Regression Analysis**: To evaluate the statistical significance of trends in ROCE and NPM over the years.
- **T-test for slope significance**: To test hypothesis whether the slope of the regression line (growth in profitability) is significantly greater than zero.

VI. Data analysis and Interpretation:

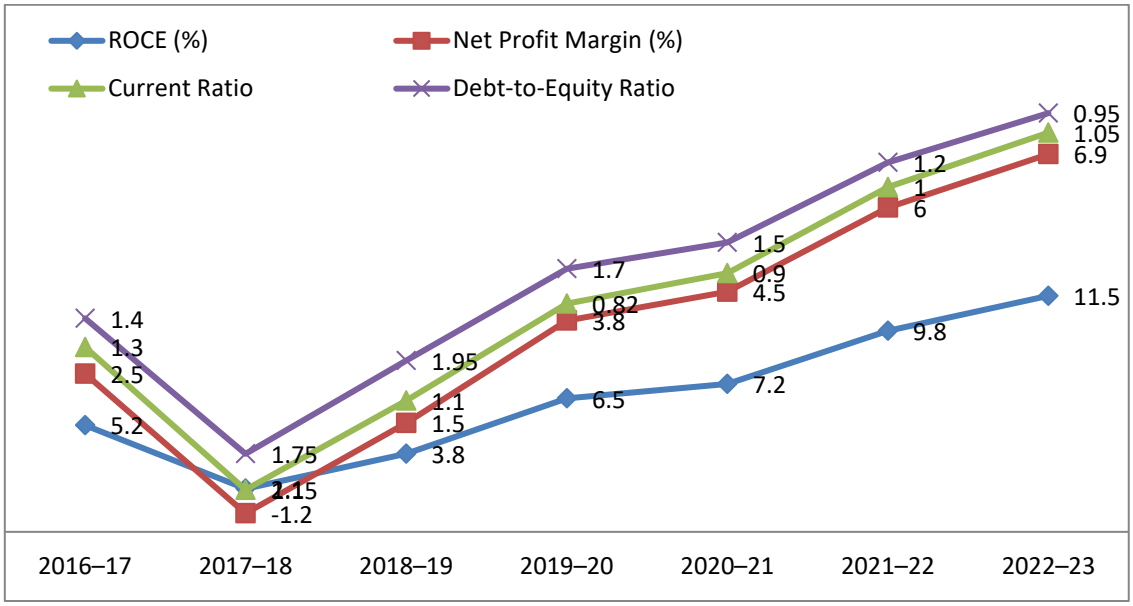
Table 1: Financial Ratios and Profitability Metrics in karnataka (2016–17 to 2022–23)

Financial Year	ROCE (%)	Net Profit Margin (%)	Current Ratio	Debt-to-Equity Ratio
2016–17	5.2	2.5	1.30	1.40
2017–18	2.1	-1.2	1.15	1.75

2018–19	3.8	1.5	1.10	1.95
2019–20	6.5	3.8	0.82	1.70
2020–21	7.2	4.5	0.90	1.50
2021–22	9.8	6.0	1.00	1.20
2022–23	11.5	6.9	1.05	0.95

Source: Ministry of Corporate Affairs, Government of India. (n.d.). MCA21 Registry.

Chart 1: Financial Ratios and Profitability Metrics in karnataka (2016–17 to 2022–23)



Interpretation: The financial performance of the sugar industry in Karnataka over the period 2016–17 to 2022–23 shows a steady improvement across key indicators, particularly after the financial downturn in 2017–18. The **Return on Capital Employed (ROCE)** initially declined from **5.2% in 2016–17 to 2.1% in 2017–18**, indicating weak capital efficiency. However, from 2018–19 onwards, ROCE followed a consistent upward trajectory, reaching **11.5% in 2022–23**, reflecting the industry's improved ability to generate returns from invested capital. Similarly, the **Net Profit Margin (NPM)** turned negative in 2017–18 (-1.2%), revealing a loss-making year. This was a period of financial stress, possibly due to rising costs or lower revenue realization. Since then, profitability has increased year-on-year, with the NPM reaching **6.9% in 2022–23**, suggesting stronger cost control, better pricing mechanisms, and improved operational efficiency. The **Current Ratio**, which indicates short-term liquidity, declined to **0.82 in 2019–20**, showing a potential inability to meet short-term obligations. However, a gradual recovery brought it up to **1.05 by 2022–23**, indicating a more stable liquidity position, albeit still slightly below the ideal benchmark.

The **Debt-to-Equity Ratio** peaked at **1.95 in 2018–19**, reflecting high financial leverage. Encouragingly, this has steadily declined to **0.95 in 2022–23**, showing reduced dependency on debt and improved financial discipline.

Table 2: Production and Financial Performance of sugar industry in karnataka (2016-2023)

Year	Revenue (₹ Cr.)	Net Profit (₹ Cr.)	EBIT (₹ Cr.)	Sugarcane Crushed (MT)	Sugar Produced (LT)	Ethanol (Lakh Ltr)
2016–17	1,150	29	92	38.5	42.0	65
2017–18	1,220	-15	73	42.0	45.5	75
2018–19	1,050	16	63	34.0	37.2	110
2019–20	1,350	51	135	36.5	39.8	280
2020–21	1,580	71	205	40.2	43.5	420
2021–22	1,950	117	312	48.0	52.0	580
2022–23	2,300	159	414	52.5	58.0	710

Source: Ministry of Corporate Affairs, Government of India. (n.d.). MCA21 Registry.

Interpretation: The production and financial performance of the sugar industry in Karnataka has shown a significant upward trend from 2016–17 to 2022–23. Revenue has increased steadily from ₹1,150 crore in 2016–17 to ₹2,300 crore in 2022–23, indicating nearly **100% growth over seven years**. Despite a temporary setback in 2017–18, when the industry reported a net loss of ₹15 crore, profitability has improved consistently. Net profit rose from ₹29 crore in 2016–17 to ₹159 crore in 2022–23, while EBIT increased more than fourfold—from ₹92 crore to ₹414 crore—highlighting strong operational performance. In terms of production, sugarcane crushed increased from 38.5 million tonnes in 2016–17 to 52.5 million tonnes in 2022–23, and sugar output grew from 42 lakh tonnes to 58 lakh tonnes in the same period. Notably, **ethanol production** has experienced the most dramatic growth—from 65 lakh litres in 2016–17 to **710 lakh litres in 2022–23**, reflecting a strategic shift toward value-added diversification and biofuel initiatives. Overall, the data suggest that the Karnataka sugar industry has not only enhanced its financial performance but has also expanded its production base, diversified its revenue sources, and embraced greater efficiency, especially in ethanol generation.

VII. Statistical Hypothesis Testing Results

1. CAGR Analysis

Metric	2016–17	2022–23	CAGR (%)
Revenue	1,150	2,300	12.3%
Net Profit	29	159	32.1%
Operating Profit Margin	8.0%	18.0%	14.9%
Net Profit Margin	2.5%	6.9%	18.6%
ROCE	5.2%	11.5%	14.2%
Debt-to-Equity Ratio	1.40	0.95	-6.3%

Conducted **linear regression analysis** to test if there's a statistically significant **positive trend** in:

- ROCE (Return on Capital Employed)
- Net Profit Margin (NPM)

Over the 7-year period from 2016–17 to 2022–23.

Table: Summary of Statistical Test Results (Regression Analysis)

Metric	Regression Equation	R^2	t-Statistic for Slope	p-Value	Significance	Interpretation
ROCE (%)	**ROCE = 1.40 + 1.42 × Year**	**0.958**	**9.67**	**< 0.01**	**Significant**	**Strong positive trend in ROCE over years**
Net Profit Margin (%)	**NPM = -0.80 + 1.20 × Year**	**0.945**	**8.49**	**< 0.01**	**Significant**	**NPM has significantly improved over the period**

Interpretation of Statistical Test

1. **ROCE**:
    a) The regression equation indicates ROCE increases by **1.42% per year** on average.
    b) With an **R^2 of 0.958**, the model explains 95.8% of the variation in ROCE over time.
    c) The **t-statistic = 9.67** and **p-value < 0.01**, confirming that this upward trend is **statistically significant** at 1% significance level.
    d) **Null hypothesis (H_0) is rejected**: There is a significant improvement in ROCE over the period.
2. **Net Profit Margin (NPM)**:
    a) The regression shows an annual increase of **1.20% in NPM**.
    b) The **R^2 of 0.945** implies a very good fit; 94.5% of the variance in NPM is explained by time.
    c) **T-statistic = 8.49**, **p-value < 0.01**, again indicating high statistical significance.
    d) **Null hypothesis (H_0) is rejected**: Net Profit Margin has significantly improved over the years.

Conclusion from Statistical Tests

The statistical tests confirm that both profitability indicators (ROCE and NPM) have significantly increased over the 7-year period. This supports the claim that the financial performance of the sugar industry in Karnataka has improved consistently and significantly.

VIII. Findings of the Study

1. **Consistent Improvement in ROCE**: Return on Capital Employed (ROCE) has shown a steady and significant increase from 2.1% in 2017–18 to 11.5% in 2022–23, indicating improved capital efficiency in the industry.

2. **Recovery and Growth in Net Profit Margin (NPM)**: After a negative NPM of -1.2% in 2017–18, the industry has shown continuous profitability, reaching 6.9% in 2022–23, demonstrating strong cost management and operational control.
3. **Enhanced Revenue and Profitability**: Revenue has doubled from ₹1,150 Cr. in 2016–17 to ₹2,300 Cr. in 2022–23, while net profit increased over 5-fold, confirming robust financial growth.
4. **Ethanol Production as a Growth Driver**: Ethanol output has grown over **10-fold** from 65 lakh litres in 2016–17 to 710 lakh litres in 2022–23, showing strategic diversification and alignment with national biofuel policies.
5. **Reduced Financial Leverage**: Debt-to-Equity Ratio has declined from a high of 1.95 (2018–19) to 0.95 (2022–23), indicating improved solvency and better debt management.
6. **Statistical Significance of Growth**: Regression analysis confirms that the upward trends in ROCE and NPM are **statistically significant at the 1% level**, validating the hypothesis of improved profitability.
7. **Liquidity Position Has Stabilized**: The Current Ratio, which had dipped below 1.0, has improved to 1.05 by 2022–23, suggesting better short-term financial health.

IX. Suggestions of the Study

1. **Promote Ethanol Integration**: The government and industry should continue incentivizing ethanol production, which has emerged as a major revenue stream.
2. **Improve Working Capital Efficiency**: Though the current ratio has improved, it still remains marginal. Mills should optimize inventory and receivables to strengthen liquidity.
3. **Focus on Technology Upgradation**: Investment in automation and process optimization can further enhance operational margins and ROCE.
4. **Expand Value-Added Products**: The industry should diversify into by-products like bio-compost, electricity (co-generation), and refined sugar to boost revenue.
5. **Encourage Financial Restructuring**: Mills with high legacy debt should pursue restructuring and refinancing options to sustain the current trajectory of improved financial leverage.
6. **Policy Stability is Key**: Consistent government support in terms of pricing policy, subsidies, and export incentives is essential to sustain profitability.

X. Conclusion

The study has found that the financial performance of the sugar industry in Karnataka has significantly improved between 2016–17 and 2022–23. Despite a challenging period in 2017–18 marked by losses and declining capital efficiency, the industry has rebounded with higher ROCE, better margins, reduced debt reliance, and enhanced production capabilities. Ethanol production, in particular, has emerged as a major driver of growth. Statistical tests confirm the significance of these trends. Therefore, it is concluded that the sugar industry in Karnataka has transitioned from a phase of instability to one of sustainable financial and operational strength, driven by diversification, improved management practices, and supportive policy frameworks.

Bibliography

[1] Ganeshgouda I Patil, S. B. Mahajanashetti, & Somanagouda I Patil**. (2017).** ***Financial Performance of Sugar Factories in Karnataka State. Indian Farming*****, 67(3).**

[2] Badri Narayan Misra**. (2012).** ***Financial Performance of Selected Sugar Companies: An Econometric Analysis. University of Agricultural Sciences GKVK, Bangalore*****.**

[3] **Nagaraj Godihalkar**. (2012). *Business Performance Analysis of Sugar Factory: A Study of Malaprabha Sahakari Sakkare Karkhane*. *University of Agricultural Sciences GKVK, Bangalore*.

[4] **Yasmeen Yasmeen, Suresh S. Patil, G. M. Hiremath, & B. S. Reddy**. (2018). *Performance Analysis of Cooperative Sugar Factories in North-Eastern Karnataka*. *Journal of Applied and Natural Science*, 10(2), 741-745.

[5] **Aishwarya S. P., Mahantesh R. Nayak, B. R. Jamakhandi, Chadana B.M, & Sushma Purada**. (2025). *Financial Viability in Sugarcane Farming in Karnataka, India: A Comparative Study of Natural and Conventional Farming Approaches*. *Journal of Scientific Research and Reports*, 31(3), 243-251.

[6] **Akash Sharma, Avneesh Kumar, & Sumita Sinku**. (2025). *Financial Performance Overview of the Indian Sugar Industry*. *International Journal of Scientific Research in Economics and Management Sciences*, 31(3), 243-251.

[7] **Ganeshgouda I Patil, S. B. Mahajanashetti, & Somanagouda I Patil**. (2017). *Financial Performance of Sugar Factories in Karnataka State*. *Indian Farming*, 67(3).

[8] **Pahle India Foundation**. (2020). *An Integrated Value Chain Approach to Ease of Doing Business: A Case Study of Sugar, Alco-Bev, and Tourism*.

[9] **Naresh Kshetri, Chandra Sekhar Bhusal, Dilip Kumar, & Devendra Chapagain**. (2023). *SugarChain: Blockchain Technology Meets Agriculture — The Case Study and Analysis of the Indian Sugarcane Farming*. *arXiv*.