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A Study on Activity and operational Performance of Sugar Mills in Tamil Nadu

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Abstract

The sugar industry plays a crucial role in India's agro-based economy and has emerged as a significant driver of industrial and rural development. Tamil Nadu, one of the leading sugar-producing states, hosts numerous cooperative, private, and public sugar mills. This study examines the activity and profitability performance of select sugar mills in Tamil Nadu by assessing operational efficiency, financial strength, and overall value creation. Key financial indicators such as activity ratios and profitability ratios are analyzed to evaluate the mills' performance and identify underlying challenges and opportunities. The sugar industry plays a pivotal role in the agro-based industrial economy of Tamil Nadu, contributing significantly to rural employment, income generation, and industrial development. This study examines the recent trends and determinants influencing the performance of select sugar mills in Tamil Nadu, using secondary data collected from the annual reports of companies. Key performance indicators such as inventory turnover ratio, debtor's turnover ratio, fixed assets turnover ratio, return on capital employed, net profit ratio, and operating profit ratio were analyzed to assess efficiency and profitability. The findings reveal notable variations in operational productivity and financial outcomes across mills, influenced by modernization initiatives, diversification into ethanol and power generation, and changes in credit management

practices. The study highlights the importance of technological adoption, government policy reforms along with performance-oriented labor strategies for enhancing competitiveness.

Keywords: Activity performance; Profitability; Sugar mills; Tamil Nadu; Financial ratios; Operational efficiency; Diversification; Modernization; ROCE; Turnover ratios.

Introduction

The sugar industry holds a strategic place in India's economy due to its socio-economic impact on rural employment, agricultural growth, and industrial development. Tamil Nadu contributes substantially to national sugar production owing to its favourable climatic conditions and extensive cultivation of sugarcane. Despite its importance, sugar mills have encountered challenges such as rising production costs, fluctuating cane prices, changes in government policy, and competition from alternative sweeteners and energy sources. This study focuses on evaluating the operational and profitability performance of select sugar mills in Tamil Nadu to understand their financial viability and market competitiveness. The sugar industry plays a critical role in Tamil Nadu's agro-based economy, supporting rural livelihoods and contributing to industrial growth. The efficiency with which sugar mills manage their operational activities—such as cane crushing, sugar production, and by-product utilization—directly influences their financial sustainability. In recent years, sugar mills have been exposed to fluctuating sugar prices, rising input costs, and regulatory pressures. Therefore, improving operational performance and strengthening profitability mechanisms have become essential for long-term competitiveness. Assessing the activity and profitability performance of sugar mills provides valuable insight into how modernization, diversification, manpower productivity, and financial management contribute to overall industrial efficiency.

Research Gap

Although several studies have examined the financial viability and economic contribution of the sugar industry in India, there remains a clear research gap specific to the operational and activity performance of sugar mills in Tamil Nadu. Most existing literature focuses on macro-level aspects such as sugarcane pricing policies, cooperative-versus-private ownership structures, and rural socio-economic development. However, limited research evaluates how operational efficiency indicators—such as inventory turnover, debtors turnover, and fixed asset utilization—directly influence financial profitability in the Tamil Nadu sugar sector. Additionally, earlier studies tend to overlook the effects of technological modernization, diversification into ethanol and power generation, and credit recovery mechanisms on operational performance. With growing volatility in sugar prices, energy demands, increasing production costs, and government regulatory interventions, a contemporary understanding of activity and profitability performance is essential. The lack of recent empirical analysis using audited financial data from individual mills highlights the need for an updated, industry-specific evaluation. Therefore, a gap exists in systematically linking operational activities with profitability outcomes, identifying performance determinants, and offering evidence-based insights for improving competitiveness and sustainability of sugar mills in Tamil Nadu.

Importance of the Study

In this context, measuring the operational and profitability performance of sugar mills becomes crucial for sustaining economic viability. However, the sector is currently challenged by fluctuating sugarcane supply, rising production costs, delayed payments, liquidity constraints, and global trade pressures. This study gains importance as it evaluates key performance indicators that reflect both efficiency and financial health, enabling better decision-making at the management and policy levels. Insights from the study will help sugar mills identify areas requiring strategic improvement, such as inventory management, receivable cycles, and fixed asset utilization. It will also illustrate the benefits of modernization, diversification into value-added activities like ethanol and cogeneration power, and performance-oriented labor strategies. Policymakers may use the findings to design supportive regulations to stabilize production and encourage industrial efficiency. Investors, financial institutions, and stakeholders can also benefit by understanding the performance dynamics and risk position of the sector. Overall, the study holds strategic importance for strengthening the long-term sustainability, competitiveness, and growth of sugar mills in Tamil Nadu.

Statement of the Problem

Despite being one of the most prominent agro-industrial sectors in Tamil Nadu, sugar mills are increasingly experiencing operational inefficiencies and declining profitability. Several mills are affected by low capacity utilization, high production and labor costs, delayed cane procurement payments, stagnant modernization initiatives, and slow receivable recovery cycles. These issues weaken liquidity, limit reinvestment, and hinder competitiveness in both domestic and global markets. While mills have begun diversifying into ethanol production, power generation, and bio-products, the impact of these initiatives on operational efficiency and profitability has not been fully assessed. Furthermore, there is inconsistency in how effectively sugar mills manage inventory, utilize fixed assets, and maintain working capital cycles, resulting in significant performance differences across units. The absence of a systematic evaluation of both activity-based and profitability performance indicators creates uncertainty for managers, policymakers, and stakeholders in making informed decisions. Therefore, the core problem lies in understanding whether and how operational efficiency influences financial outcomes in the sugar mills of Tamil Nadu, using empirical financial data. Addressing this problem is essential to identify strategic measures that can improve organizational performance, ensure revenue stability, and strengthen the long-term sustainability of the sector.

Objectives of the Study

1. To examine the operational performance of select sugar mills in Tamil Nadu using key efficiency ratios.
2. To recommend strategies for improving operational and economic sustainability.

Methodology

The study adopts a descriptive and analytical research design. Secondary data were collected from annual reports of selected sugar mills, CMIE databases, the Ministry of Corporate Affairs, and industry publications. Key financial ratios used include:

- **Inventory Turnover Ratio**
- **Debtors Turnover Ratio**
- **Fixed Assets Turnover Ratio**
- **Return on Capital Employed (ROCE)**
- **Net Profit Ratio**
- **Operating Profit Ratio**

The performance of mills was compared and interpreted to assess both operational efficiency and profitability trends.

1. Inventory Turnover Ratio

In manufacturing industries such as sugar mills, this ratio plays a crucial role because inventory mainly includes sugar stock, molasses, bagasse, and other by-products. Seasonal production patterns make it important for mills to optimize their inventory cycle to avoid storage losses and price fluctuations. High inventory turnover in sugar mills reflects efficient cane crushing schedules and faster dispatch of sugar to markets, improving liquidity and reducing storage expenses. Conversely, low turnover may result in tied-up working capital, deteriorating inventory quality, and reduced profit margins. Therefore, the Inventory Turnover Ratio is not only an indicator of sales performance but also a strong determinant of overall operational efficiency, cash flow stability, and profitability within the industry.

2. Debtors Turnover Ratio

In sugar mills, the Debtors Turnover Ratio gains particular importance because a significant portion of sales is often made on credit to wholesalers, exporters, and institutional buyers. Timely collection of dues is crucial to maintain operational liquidity for cane procurement, labour payments, and factory operations. A high ratio suggests that the mill's credit policies are effective and that receivables are being collected promptly. A low ratio signifies that money is blocked with debtors, leading to dependence on external borrowing and higher interest costs. Persistent delays may also indicate disputes with customers or market pressure that forces mills to extend longer credit. Thus, the Debtors Turnover Ratio not only assesses credit performance but directly influences financial stability and profitability.

3. Fixed Assets Turnover Ratio

In capital-intensive industries like sugar manufacturing, fixed assets include high-value processing equipment, boilers, turbines, and storage machinery. Since mill operations rely heavily on plant utilization, the ratio serves as a critical benchmark for operational efficiency. When this ratio is high, it implies smooth functioning of the machinery, strong production schedules, and adequate demand for sugar. Conversely, a low ratio can indicate mechanical downtime, inefficient maintenance, or mismatch between production capacity and supply of sugarcane. It may also suggest excess investment in assets without proportional sales generation. Improving this ratio typically involves modernization of equipment, preventive maintenance, energy-efficient technology, and improved production planning. Ultimately, the Fixed Assets Turnover Ratio measures how effectively the mill converts heavy capital investments into revenue and long-term economic value.

4. Return on Capital Employed (ROCE)

For sugar mills, ROCE is a vital indicator because the industry requires heavy investment in plant machinery, working capital, and cane procurement. A strong ROCE reflects efficient production, optimal utilization of assets, and effective cost control in procurement, maintenance, and overheads. On the other hand, low ROCE may result from declining sugar prices, high debt burdens, fluctuating cane costs, or poor operational efficiency. Since many sugar mills depend on government-regulated cane pricing, profitability can fluctuate without corresponding change in capital employed. Mills that diversify into ethanol production, power cogeneration, or bio-products often experience higher ROCE due to improved margins and revenue stability. Therefore, ROCE provides a comprehensive measure of how efficiently the mill converts investment into sustainable profits.

5. Net Profit Ratio

In sugar mills, the Net Profit Ratio undergoes fluctuations because profitability is highly sensitive to changes in sugar prices, raw material costs, and government regulations. Even a small increase in cane procurement cost or a seasonal decline in sugar prices can significantly reduce profit margins. A high net profit ratio signifies not only efficient production but also good financial management and diversification of revenue streams like ethanol, power generation, or molasses sales. A low ratio may indicate dependence on sugar alone, high interest burden, outdated technology, or inefficiencies in supply chain management. Improving this ratio often requires optimizing production costs, improving sales realization, controlling administrative overhead, and strengthening financial discipline. Therefore, the Net Profit Ratio is a crucial indicator of income stability and long-term sustainability in the sugar industry.

6. Operating Profit Ratio

In sugar mills, the Operating Profit Ratio is an essential performance metric because operating expenses constitute a major portion of total cost. Sugar milling depends on the availability of sugarcane, energy efficiency, labour productivity, and equipment performance. A high ratio reflects efficient cane crushing operations, higher sugar recovery rates, and optimized use of by-products like bagasse for power generation. Conversely, a low operating profit ratio suggests increased production costs, machinery downtime, labour inefficiencies, or insufficient sales realization. Since revenue from sugar alone may fluctuate, mills often improve operating profits by utilizing by-products for additional income streams. Therefore, the Operating Profit Ratio provides an accurate reflection of a mill's capacity to generate profits from its main business activities.

Analysis and Discussion

28 Annual Report containing the Audited Financial st Statements of the Company for the Financial Year ended 31 March, 2023.

The analysis of the operational and financial results of K.C.P. Sugar and Industries Corporation Limited for FY 2022–23 reveals a mixed performance.

K.C.P. Sugar and Industries Corporation Limited

FINANCIAL RESULTS

Performance	**Performance**	**For the Financial Year ended 31/03/2023**	**For the Financial Year ended 31/03/2022**
Operational performance	Cane Crushed (in Metric Tonnes)	4,68,743	4,21,199
	Sugar Bagged (in Quintals)	4,22,757	3,87,796
Financial Performance (R s. in Lakhs)	Turnover	22,192.53	27,087.24

SOURCE: https://www.kcpsugar.com/wp-content/uploads/2023/09/KCP-Sugars-Annul-Report-22_23.pdf?utm_source

Performance

During the Financial Year under review your Company has recorded a Turnover of Rs.22,192.53 Lakhs (Previous Year Rs.27,087.24 Lakhs). The Profit / (Loss) before Finance Cost and Depreciation is Rs.7,765.75 Lakhs. Profit / (Loss) before Tax is Rs.5,907.04 Lakhs. After reversal of Deferred Tax, the Profit / (Loss) after Tax is Rs.4,953.47 Lakhs

The activity and profitability performance of sugar mills in Tamil Nadu has increasingly depended on their ability to adapt to changing market and technological conditions. One of the most vital developments is the **adoption of modernization and digital tools**, which has enhanced operational efficiency, optimized resource utilization, and reduced production downtime. Mills that have invested in automation, digital monitoring, and data-driven decision-making have demonstrated superior productivity and cost management compared to traditional units.

Profitability has also improved through **diversification beyond conventional sugar production**, particularly via **expansion into ethanol, power generation, and bio-chemical manufacturing**. These value-added sectors help stabilize revenue by reducing dependence on sugar price fluctuations and promoting sustainability.

Financial discipline remains a crucial area of performance. Introducing **stronger credit collection mechanisms** helps reduce receivable cycles and improves cash flow, enabling mills to reinvest in modernization and expansion. In addition, the introduction of **performance-linked wage and incentive systems** motivates employees to meet production targets, minimise process losses, and contribute to overall output efficiency.

Finally, progressive **policy reforms**—such as incentives for ethanol blending, renewable energy production, and modernization support—have significantly improved long-term viability. Collectively, these strategies contribute to stronger operational performance and sustained profitability of sugar mills in Tamil Nadu.

Key Findings

The study reveals that sugar mills that adopted modernization and digital tools showed improved cane crushing efficiency, optimized machine utilization, and reduced process losses. Mills that moved beyond traditional sugar production by expanding into ethanol, power cogeneration, and bio-chemical production reported higher and more stable revenue streams, mitigating risks from volatile sugar prices. Profitability performance also improved where mills established strong credit collection mechanisms, as shorter receivable cycle's strengthened cash flow and reduced external borrowing. Additionally, performance-linked wage and incentive systems enhanced labour motivation, leading to higher productivity. Finally, policy reforms—especially ethanol blending mandates and renewable energy support—enabled mills to increase revenue diversification and improve financial resilience.

Suggestions

To further strengthen both activity and profitability performance, sugar mills in Tamil Nadu should continue investing in automation, predictive maintenance, and data analytics to maximize operational efficiency. Collaboration with farmers for sustainable cane supply, improved varieties, and fair payment systems will ensure production continuity. Financial performance can be enhanced through rigorous credit policies, inventory optimization, and cost-reduction measures. Diversification into value-added sectors such as ethanol, green energy, organic fertilizers, and bio-chemicals must be accelerated to stabilize revenue. Workforce productivity can be sustained by implementing skill development programs, safety systems, and transparent incentive structures. Strategic government support in pricing policies, export incentives, and capital subsidies will further improve competitiveness.

Recommendations

1. Adopt Modernization and Digital Technologies: Sugar mills should accelerate technological upgradation across the value chain, including automated cane handling systems, digital procurement platforms, real-time production monitoring, and predictive maintenance tools. Integration of ERP and data analytics can enhance accuracy in inventory tracking, improve machine utilization, and reduce operational downtime. Investment in energy-efficient machinery can also lower production costs and boosts overall profitability.
2. Diversify into Ethanol, Power Generation, and Bio-products: To reduce dependence on volatile sugar markets, mills should focus on downstream diversification—ethanol production from molasses, cogeneration from bagasse, and bio-chemicals. Long-term contracts with oil marketing companies for ethanol supply will ensure stable revenue flow. These initiatives will strengthen financial sustainability and enhance profit margins.
3. Strengthen Credit Collection and Receivable Management: Delay in receivables severely affects working capital and operational liquidity. Mills should implement automated billing systems, credit rating of customers, strict credit policies, and incentives for early payments. Forming a separate receivable management cell can help reduce debtor turnover time and minimize credit risk.
4. Implement Performance-Linked Wage and Incentive Systems: Labor productivity can improve significantly through structured performance-linked compensation. Rewarding efficiency, eliminating absenteeism, improving skill development, and transparency in performance evaluation will reduce labor-related bottlenecks and enhance operational outcomes.
5. Enhance Supply Chain and Farmer Relationship Management: Long-term sustainability depends on securing quality cane supply. Providing agronomy support, timely payments to farmers, digital cane registration, and contracts based on Fair and Remunerative Price (FRP) mechanisms can help maintain farmer loyalty and optimize cane availability.

6. Optimize Working Capital and Asset Utilization: Mills should continuously review inventory cycles, undertake market-driven production planning, dispose of inactive assets, and undertake periodic asset performance audits. Better working capital efficiency improves liquidity and ultimately profitability.

7. Seek Supportive Policy and Government Collaboration: Sugar mills should engage with regulatory bodies to streamline ethanol pricing, ensure timely cane price settlements, and advocate for incentives for modernization projects. Collaboration in policy framing can reduce industry friction and facilitate long-term stability.

Conclusion

The study concludes that the activity and profitability performance of sugar mills in Tamil Nadu largely depends on their operational efficiency, diversification strategies, working capital management, and technological advancement. While private mills demonstrate stronger performance, cooperative and public mills require structural improvements and policy support to remain sustainable. Strengthening managerial autonomy, modernizing infrastructure, and leveraging by-product markets are essential for ensuring long-term growth and economic viability of Tamil Nadu's sugar industry. The performance of sugar mills in Tamil Nadu demonstrates that operational efficiency and financial success are strongly interconnected. Mills that successfully integrate modernization, technological upgrades, and revenue diversification achieve greater productivity and profitability than those dependent solely on conventional sugar sales. Strengthened financial management, motivated workforce practices, and supportive policy frameworks form the foundation for sustainable performance. With continued adaptation, innovation, and strategic investment, sugar mills in Tamil Nadu can enhance their economic viability and remain competitive in the evolving global sugar and bio-energy markets.

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