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A Study on Financial Performance Analysis in Chennai Port Authority

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ABSTRACT: Financial performance analysis is essential for understanding the operational efficiency, profitability, and long-term sustainability of any organization. Chennai Port Authority (CPA), one of India's oldest and busiest major ports, plays a critical role in maritime trade and economic development. This study evaluates the financial performance of CPA over a five-year period from 2020 to 2024 using secondary data from audited annual reports. Various financial tools including profitability ratios, liquidity ratios, efficiency ratios, solvency ratios, DuPont analysis, trend analysis, correlation, and regression were applied. The findings indicate that CPA has improved its profitability margins, maintained strong liquidity, reduced debt dependency, and enhanced asset utilization. However, receivables turnover has declined significantly, and return on equity dropped in 2024 due to lower net margins and reduced financial leverage. The study concludes with practical recommendations to improve credit management, control operating costs, and strengthen long-term financial health.

KEYWORDS: Financial performance, ratio analysis, Chennai Port, DuPont analysis, liquidity, solvency, efficiency.

I. INTRODUCTION

Financial performance analysis is a cornerstone of strategic management, particularly in public infrastructure organizations like ports. Chennai Port Authority (CPA), formerly Chennai Port Trust, is a major Indian port operating under the Ministry of Ports, Shipping, and Waterways. With a history spanning over 140 years, CPA handles diverse cargo including containers, automobiles, petroleum products, and coal.

In recent years, Indian ports have faced mounting pressures from private competitors, digital transformation, environmental regulations, and global trade volatility. Understanding CPA's financial trajectory is essential for ensuring its competitiveness and sustainability. This study systematically examines CPA's financial health using quantitative tools covering profitability, liquidity, efficiency, solvency, and integrated performance metrics.

OBJECTIVES OF THE STUDY

- To study the existing financial performance of Chennai Port Authority for the financial years 2020 to 2024.
- To analyze the impact of operating income on the overall financial performance of CPA.
- To identify the factors affecting revenue generation at CPA.
- To assess the port's financial health and sustainability over the study period.
- To suggest practical measures for enhancing financial efficiency and promoting business growth.

II. REVIEW OF LITERATURE

Devi, Sabitha, and Chitra (2023) analysed Chennai Port's operational efficiency and recommended better cost control. **Gomathi (2012)** compared pre- and post-reform ship performance, emphasizing turnaround time. **Goldar and Paul (2018)** linked port infrastructure to export growth, while **Sekar (2025)** proposed net surplus per vessel as a refined efficiency metric.



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Agrawal and Srivastava (2024) used Data Envelopment Analysis to benchmark container ports, including Chennai. **Shafeeqe and Malini (2024)** conducted inter- and intra-port performance comparisons. **Kannan and Saravanan (2017)** forecasted cargo growth using time-series models. **Krishnan (2019)** emphasized technology and training for financial efficiency.

Raghavan and Rao (2021) highlighted AI and IoT for operational agility. **Kapoor and Singh (2022)** stressed financial transparency and public-private partnerships. **Mahesh and Kumar (2020)** examined GST's impact on port finances. **Iyer and Nair (2019)** focused on cost efficiency in container handling.

Anwar and Shah (2021) linked revenue per ton to port competitiveness. **Ramesh and Laxman (2022)** explored digitalization's financial benefits. **Karthik and Suresh (2023)** addressed pandemic-era resilience. **Mehta and Raj (2022)** advocated supply chain integration. **Gopalakrishnan and Prakash (2020)** linked sustainability to long-term cost savings.

This study fills the gap of a comprehensive longitudinal ratio-based analysis of Chennai Port covering the post-pandemic period.

III. RESEARCH DESIGN

Descriptive and analytical research design was adopted. The study describes the existing financial condition of Chennai Port Authority using quantitative secondary data over five consecutive financial years (2020 to 2024). This design allows identification of trends, patterns, and causal relationships in financial performance.

SOURCES OF DATA

Secondary data were sourced from audited annual reports of Chennai Port Authority, government publications, and industry databases. The financial statements included balance sheets, profit and loss accounts, and cash flow statements for the relevant period.

SAMPLE SIZE

The study covers five financial years (2020, 2021, 2022, 2023, and 2024) of annual reports. No sampling was required as the entire population of available financial statements was analysed.

TOOLS USED FOR ANALYSIS

- Profitability ratios: Gross Profit Margin, Operating Profit Margin, Net Profit Margin
- Liquidity ratios: Current Ratio, Quick Ratio
- Efficiency ratios: Asset Turnover, Fixed Asset Turnover, Receivables Turnover
- Solvency ratios: Debt-to-Equity, Equity Multiplier
- DuPont analysis: Return on Equity decomposition
- Trend analysis: Year-on-year percentage changes in operating costs
- Correlation analysis: Pearson and Spearman between Return on Assets and Debt-Equity
- Simple linear regression: Quick Ratio versus Net Profit Margin

Statistical computations were performed using Microsoft Excel and SPSS.

PERCENTAGE ANALYSIS

Table 1: Gross Profit Margin Trend (2020 to 2024)

(Values in percentage)

Year	Gross Profit Margin
2020	26.5
2021	29.8
2022	31.4
2023	33.6
2024	37.3

Source: Primary data



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Interpretation:

The Gross Profit Margin increased steadily from 26.5 percent in 2020 to 37.3 percent in 2024. This indicates that CPA has effectively managed its direct costs relative to revenue, reflecting enhanced operational efficiency in cargo handling and storage activities.

Table 2: Net Profit Margin Trend (2020 to 2024)
(Values in percentage)

Year	Net Profit Margin
2020	0.23
2021	0.73
2022	13.57
2023	16.11
2024	11.05

Source: Primary data

Interpretation:

Net Profit Margin rose from 0.23 percent in 2020 to a peak of 16.11 percent in 2023, driven by improved operating performance and lower tax provisions. However, it declined to 11.05 percent in 2024, suggesting increased non-operating expenses or higher tax outflows.

Table 3: Current Ratio Trend (2020 to 2024)

Year	Current Ratio
2020	1.34
2021	1.4
2022	1.4
2023	1.4
2024	1.31

Source: Primary data

Interpretation:

The Current Ratio remained stable between 1.31 and 1.40, well above the conventional threshold of 1 to 1. This confirms that CPA has sufficient current assets to cover short-term liabilities, indicating strong liquidity.

Table 4: Receivables Turnover Ratio Trend (2020 to 2024)

Year	Receivables Turnover Ratio
2020	5.55
2021	4.81
2022	4.46
2023	3.55
2024	2.72

Source: Primary data

Interpretation:

The Receivables Turnover Ratio declined sharply from 5.55 to 2.72, indicating that customers are taking longer to pay their dues. This could strain cash flow and increase bad debt risk.



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Table 5: Debt-to-Equity Ratio Trend (2020 to 2024)

Year	Debt-to-Equity Ratio
2020	0.88
2021	0.87
2022	0.74
2023	0.63
2024	0.51

Source: Primary data

Interpretation:

The Debt-to-Equity Ratio decreased consistently, reflecting reduced dependence on debt financing. This indicates improved financial stability and lower financial risk over the years.

CHI-SQUARE (CORRELATION ANALYSIS)

Table 6: Correlation between Return on Assets (ROA) and Debt-to-Equity Ratio

Method	Correlation Coefficient	P-Value
Pearson	0.657	0.228
Spearman	0	1

Interpretation:

The Pearson correlation (r equals 0.657) indicates a moderate positive relationship between ROA and Debt-Equity Ratio, but the p-value (0.228 greater than 0.05) is not statistically significant. The Spearman correlation (ρ equals 0) confirms no rank-based relationship. Therefore, there is no reliable statistical evidence that ROA and leverage are significantly related.

Hypothesis:

Null Hypothesis (H_0): There is no significant relationship between Return on Assets and Debt-Equity Ratio.

Alternative Hypothesis (H_1): There is a significant relationship between Return on Assets and Debt-Equity Ratio.

Conclusion: We fail to reject the null hypothesis. The observed relationship may be coincidental.

REGRESSION ANALYSIS

Table 7: Simple Linear Regression (Quick Ratio on Net Profit Margin)

Variable	Un standardized Coefficient	Standard Error	P-Value
Constant	2.836	5.864	0.654
Quick Ratio	44.677	17.535	0.084

Interpretation:

The Quick Ratio coefficient (44.677) suggests a positive but weak relationship with Net Profit Margin. However, the p-value (0.084 greater than 0.05) indicates that this relationship is not statistically significant at the 95 percent confidence level. It is marginally significant at the 90 percent level, suggesting a weak association worth further exploration.

Hypothesis:

Null Hypothesis (H_0): There is no significant relationship between Quick Ratio and Net Profit Margin.

Alternative Hypothesis (H_1): There is a significant relationship between Quick Ratio and Net Profit Margin.

Conclusion: We fail to reject the null hypothesis at the 5 percent significance level. The Quick Ratio does not have a statistically significant impact on Net Profit Margin.



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IV. CONCLUSION

Chennai Port Authority has demonstrated financial resilience and strategic maturity over the five-year period from 2020 to 2024. Profitability has improved, liquidity remains strong, and debt levels are declining. The port has successfully navigated post-pandemic trade fluctuations and increased competition from private ports. However, rising operational costs, weak receivables turnover, and a recent dip in net profit margin and return on equity pose medium-term risks. The shift toward equity financing is healthy but must be balanced with operational efficiency gains. The DuPont analysis clearly shows that the 2024 ROE decline is not due to operational failure but rather a strategic trade-off between lower leverage and slightly reduced profitability.

In conclusion, Chennai Port Authority is financially well-managed and positioned for sustainable growth, provided it continues to focus on cost control, credit management, innovation, and strategic investments.

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