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Analysing Shree Mahalakshmi Metal Industries Financial Inventory to Optimize Stocking and Reduce Costs in Competitive and Volatile Markets

DR. Satishkumar V1, Kaviyashree A2

IMBA., NET., PhD, Assistant Professor – Department of Management (PG) Sri Ramakrishna College of Arts & Science, Coimbatore

2Student, Department of MBA, Sri Ramakrishna College of Arts & Science, Coimbatore

Abstract-- This article focuses on analysing the financial inventory management to enhance cost efficiency and optimize stock levels in a competitive and volatile market. Using secondary financial data from 2014– 2024, key ratios such as inventory turnover, current ratio, quick ratio, and profitability indicators like ROCE and ROE were examined. The study reveals that extended inventory holding and cash conversion periods have affected liquidity, while profitability improved after 2020 due to better cost and working capital control. The findings emphasize the importance of integrating financial analysis with predictive modeling and digital inventory systems to improve cash flow, reduce excess stock, and strengthen operational sustainability.

Keywords-- Financial Inventory Analysis, Working Capital Management, Liquidity, Profitability, Predictive Modeling, Cost Reduction, Inventory Optimization, ROCE, ROE, Cash Conversion Cycle.

I. INTRODUCTION

Inventory management is one of the most important aspects of financial control in any manufacturing organization. It helps in maintaining a smooth flow of production while avoiding excess stock and unnecessary costs. Effective inventory management ensures that the company's resources are used efficiently, improving both liquidity and profitability.

The study evaluates how the company manages its inventory through financial statements and ratio analysis. By examining stock turnover, liquidity, and working capital, the research aims to understand how inventory decisions affect overall financial performance. A well-balanced inventory system can reduce holding costs, improve cash flow, and strengthen the company's financial stability in a competitive market.

II. OBJECTIVES

- To assess the efficiency of the company's inventory management using balance sheet data, focusing on stock turnover and levels.

- To identify cost-reduction opportunities in inventory processes through balance sheet analysis, ensuring operational efficiency.

III. REVIEW OF LITERATURE

1. *Amar Prabha et al. (2024)* The study analysed five years of inventory data and revealed that efficient forecasting and replenishment strategies improved inventory turnover and reduced excess stock. The research emphasized how aligning inventory with demand enhances cash flow and operational performance. It also highlighted that better control of raw material usage leads to improved working capital efficiency.
2. *Shashwat Agrawal & Venkata R. Chintha (2023)* This study examined the role of predictive analytics in inventory management using historical data and machine learning. The results showed that predictive models increase forecasting accuracy, helping firms maintain optimal stock levels and minimize holding costs. The study concluded that data-driven forecasting supports better decision-making in volatile markets.
3. *Sarit Maitra (2024)* Using Monte Carlo Simulation and Bayesian optimization, this study explored how dynamic inventory models can increase profitability. It found that flexible inventory adjustments reduce risks of overstocking and understocking. The research also suggested that statistical modeling improves forecasting precision and supports real-time inventory decisions.
4. *Silvia Carpitella & Joaquín Izquierdo (2025)* This paper focused on the use of digital technologies like IoT and AI in inventory management. It showed that real-time tracking systems help companies lower holding costs and improve turnover. The study concluded that digital transformation enhances efficiency and strengthens asset management through accurate forecasting.



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5. *Gaikwad Yashh Hemant & Najla Shafighi (2023)* The researchers used the Economic Order Quantity (EOQ) model and Excel-based tools to optimize inventory systems. Their findings indicated that automation improves accuracy, transparency, and cost efficiency. The study highlighted that holding cost and unit price significantly influence total inventory costs, with holding cost being the key driver.
6. *Lei et al. (2023)* This study applied deep learning models like LSTM and Bi-LSTM to predict inventory needs in uncertain conditions. It found that the Bi-LSTM model achieved the highest accuracy, minimizing forecasting errors. The results proved that artificial intelligence can enhance inventory planning and reduce both overstock and shortage risks.
7. *Singh & Vaidya (2024)* The study analyzed how machine learning techniques improve retail inventory management. It showed that ML-based forecasting reduces stockouts, increases efficiency, and supports better sales planning. The authors concluded that integrating AI and IoT technologies helps retailers achieve real-time inventory optimization.
8. *Sarit Maitra & Sukanya Kundu (2023)* This research focused on backorder prediction using advanced classification methods such as Balanced Bagging, Fuzzy Logic, and VAE-GANs. The study demonstrated that ensemble models improved forecast accuracy and reduced financial losses. It concluded that predictive analytics supports better risk management and customer satisfaction.
9. *Rashmi Ranjan Panigrahi & Padma Charan Mishra (2024)* Their study examined the relationship between inventory management practices and operational performance in the steel manufacturing sector. Using correlation and regression analysis, they found that efficient inventory control enhances productivity and profitability. The findings stressed the importance of strong inventory systems in maintaining competitiveness.
10. *Khurshid Ali & Numaira Showkat (2022)* This study investigated how inventory turnover affects operating profits in the pharmaceutical industry. Data from major firms showed that higher turnover ratios lead to increased profitability. The research concluded that efficient inventory management contributes directly to better financial performance and long-term sustainability.
11. *Karthik Kamath & Prof. Uma Sharma (2021)* This study identified the major factors influencing inventory management in manufacturing, such as demand forecasting, supplier performance, and technology adoption. It emphasized that improved forecasting and automation enhance accuracy and cost efficiency. The researchers suggested using lean practices and digital tools to optimize inventory control and reduce waste.
12. *Gideon Tayo Akinleye & Olufemi Dadebo Adesina (2024)* The study examined how inventory management impacts the financial performance of manufacturing firms in Nigeria. By analysing data from 28 listed companies, it found that shorter inventory conversion periods and efficient working capital management improved profitability. The results confirmed that strong inventory control leads to better asset utilization and returns.

IV. RESEARCH METHODOLOGY

Research Design and Approach

The study follows an analytical research design with a quantitative approach. It focuses on analysing secondary financial data from the balance sheets and financial statements for the period 2014–2024. The research aims to evaluate inventory efficiency, liquidity position, and cost-reduction opportunities through financial ratio analysis and statistical interpretation.

Sampling Technique

The study uses a purposive sampling technique, as the data were specifically chosen from the company's published financial records to represent its overall performance during the selected ten-year period. The study relies on company-specific data, it does not involve primary respondents or random sampling.

Statistical Tools Used

The analysis was carried out using SPSS and Microsoft Excel. The main tools applied include

- Ratio analysis
- Trend analysis
- Correlation
- Regression analysis
- ANOVA (Analysis of Variance)



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To examine the relationship between inventory, liquidity, and profitability indicators. Graphical representation and comparative balance sheet analysis were also used to interpret results effectively.

Variables Studied

The variables studied in the research include Inventory

Turnover Ratio, Working Capital, Cost of Goods Sold, Return on Capital Employed (ROCE), Return on Equity (ROE), Current Ratio, Quick Ratio, and Net Profit Margin. These variables were analysed to understand their interrelationship and impact on overall financial performance.

V. DATA ANALYSIS AND INTERPRETATION

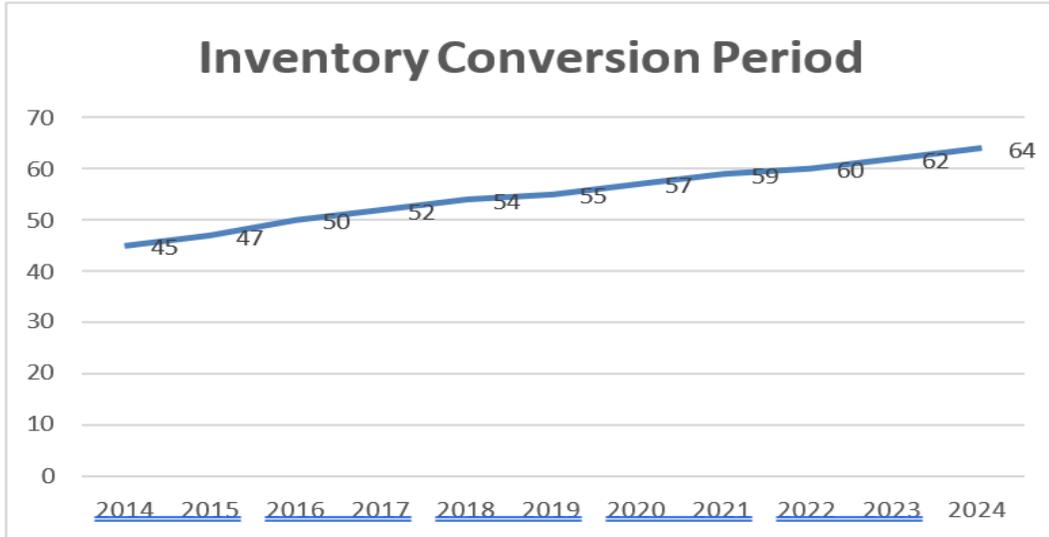
1. Working Capital Components

Inventory Conversion Period

| Year | Shree Mahalakshmi Metal Industries (In Days) |
|-------------|---|
| 2014 | 45 |
| 2015 | 47 |
| 2016 | 50 |
| 2017 | 52 |
| 2018 | 54 |
| 2019 | 55 |
| 2020 | 57 |
| 2021 | 59 |
| 2022 | 60 |
| 2023 | 62 |
| 2024 | 64 |
| Mean | 55.00 |
| SD | 6.116 |
| CV | 0.03 |
| CAGR in (%) | 3.61 |
| Skewness | -0.212 |
| Kurtosis | -0.934 |
| Range | 19.00 |

SOURCE: Secondary Data

CHART SHOWING INVENTORY CONVERSION PERIOD



Interpretation

The inventory conversion period rose from 45 days in 2014 to 64 days in 2024, with an average of 55 days. The low variability (CV = 0.03) shows consistent inventory management, while a CAGR of 3.61% indicates a moderate slowdown in turnover.

Slight negative skewness and flat kurtosis suggest stable but slightly uneven distribution. Overall, inventory management is steady, but efficiency improvements may be needed to avoid working capital issues.

Account Receivable Period (ARP)

| Year | Shree Mahalakshmi Metal Industries (In Days) |
|------|--|
| 2014 | 45.31 |
| 2015 | 43.68 |
| 2016 | 47.75 |
| 2017 | 55.68 |
| 2018 | 57.13 |
| 2019 | 47.97 |
| 2020 | 45.89 |
| 2021 | 47.27 |
| 2022 | 51.68 |
| 2023 | 53.03 |

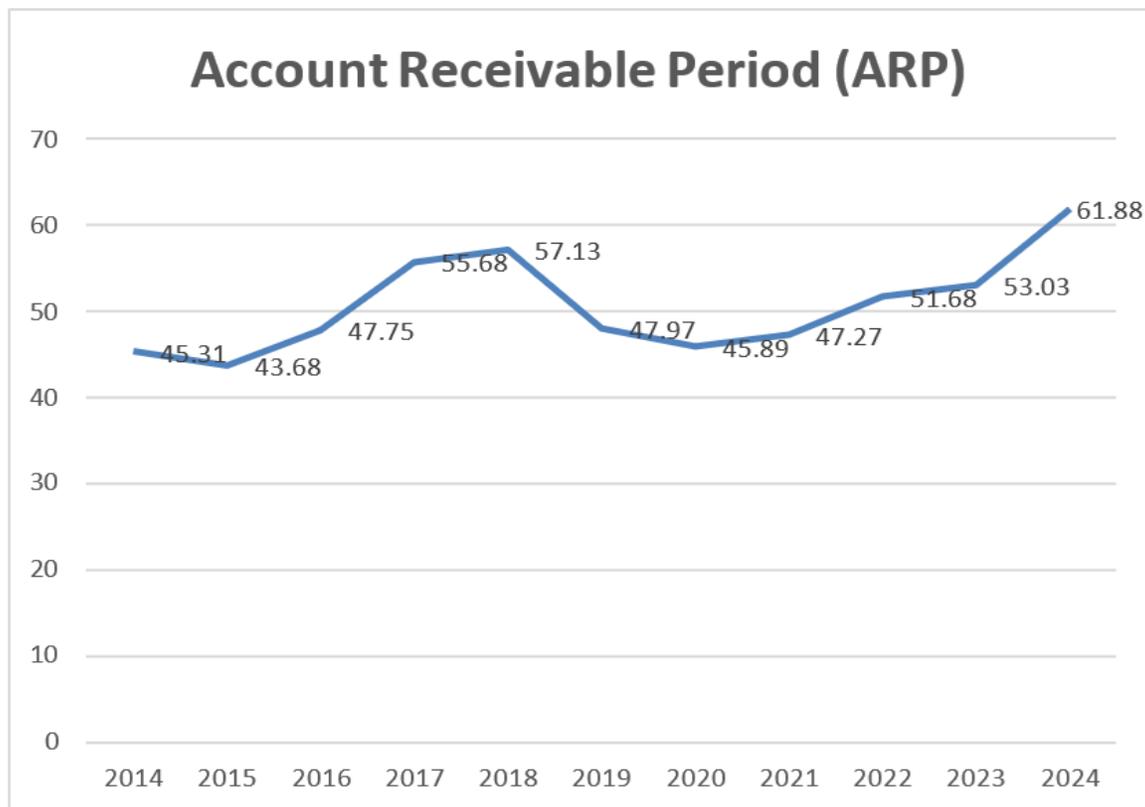


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| | |
|-------------|-------|
| 2024 | 61.88 |
| Mean | 50.66 |
| SD | 5.72 |
| CV | 11.29 |
| CAGR in (%) | -0.03 |
| Skewness | 0.74 |
| Kurtosis | -0.35 |

SOURCE: Secondary Data

CHART SHOWING ACCOUNT RECEIVABLE PERIOD





Interpretation

The account receivable period (ARP) fluctuated between 43.68 days in 2015 and 61.88 days in 2024, with a mean of 50.66 days. The standard deviation of 5.72 and CV of 11.29% indicate moderate variability in credit collection efficiency.

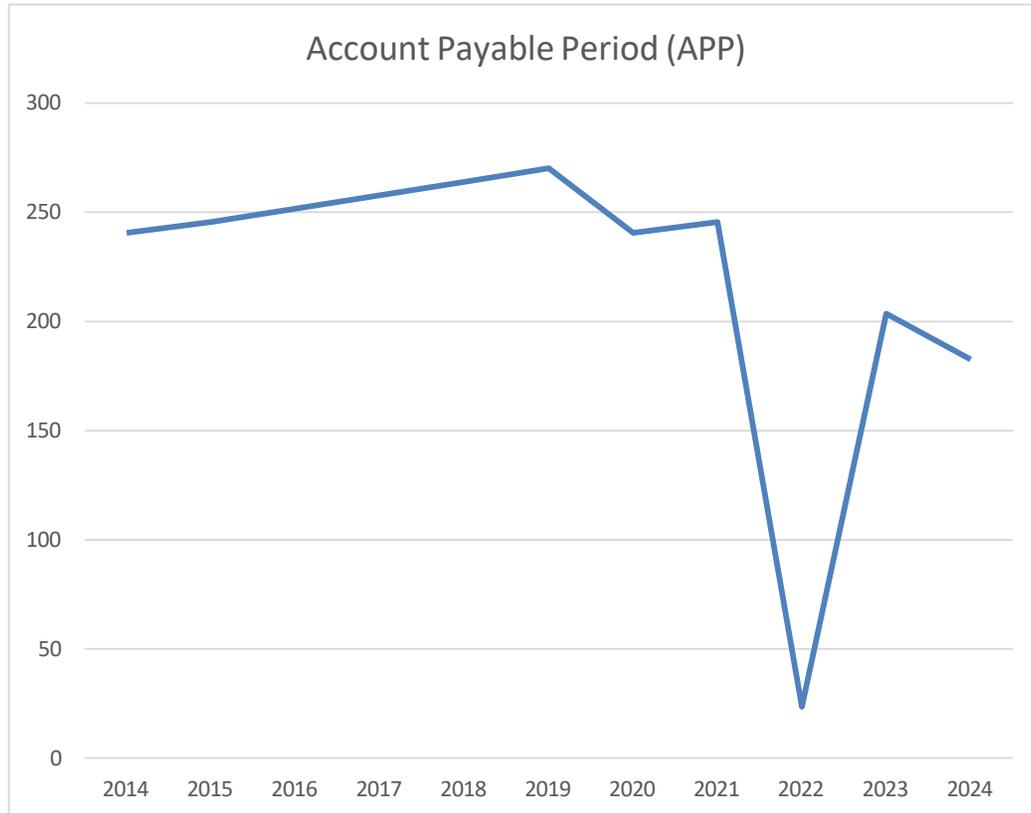
The CAGR of -0.03% shows an overall stagnant trend, despite recent increases. Positive skewness (0.74) reflects longer tails toward higher collection periods, especially in 2017, 2018, and 2024, while kurtosis (-0.35) indicates a flatter distribution. Overall, receivable management showed inconsistent efficiency, with extended credit periods in certain years potentially delaying cash inflows and increasing credit risk.

Account Payable Period (APP)

| Year | Shree Mahalakshmi Metal Industries (In Days) |
|-------------|---|
| 2014 | 240.53 |
| 2015 | 245.57 |
| 2016 | 251.65 |
| 2017 | 257.77 |
| 2018 | 263.93 |
| 2019 | 270.13 |
| 2020 | 240.53 |
| 2021 | 245.57 |
| 2022 | 23.55 |
| 2023 | 203.56 |
| 2024 | 182.63 |
| Mean | 220.49 |
| SD | 70.20 |
| CV | 31.84 |
| CAGR in (%) | 0.03 |
| Skewness | -2.60 |
| Kurtosis | 7.31 |

SOURCE: Secondary Data

CHART SHOWING ACCOUNT PAYABLE PERIOD



Interpretation

The account payable period (APP) varied widely from 23.55 days in 2022 to 270.13 days in 2019, with a mean of 220.49 days. A high standard deviation (70.20) and CV (31.84%) indicate significant inconsistency in credit payment practices. The CAGR (0.03%) shows long-term stability, but year-to-year fluctuations reveal irregular working capital handling.

Negative skewness (-2.60) reflects a distribution pulled toward lower periods, influenced by 2022, while high positive kurtosis (7.31) highlights extreme deviations and peaks. Overall, while extended credit periods may support liquidity, such volatility and extremes could undermine supplier trust and indicate inefficiencies in payables management.



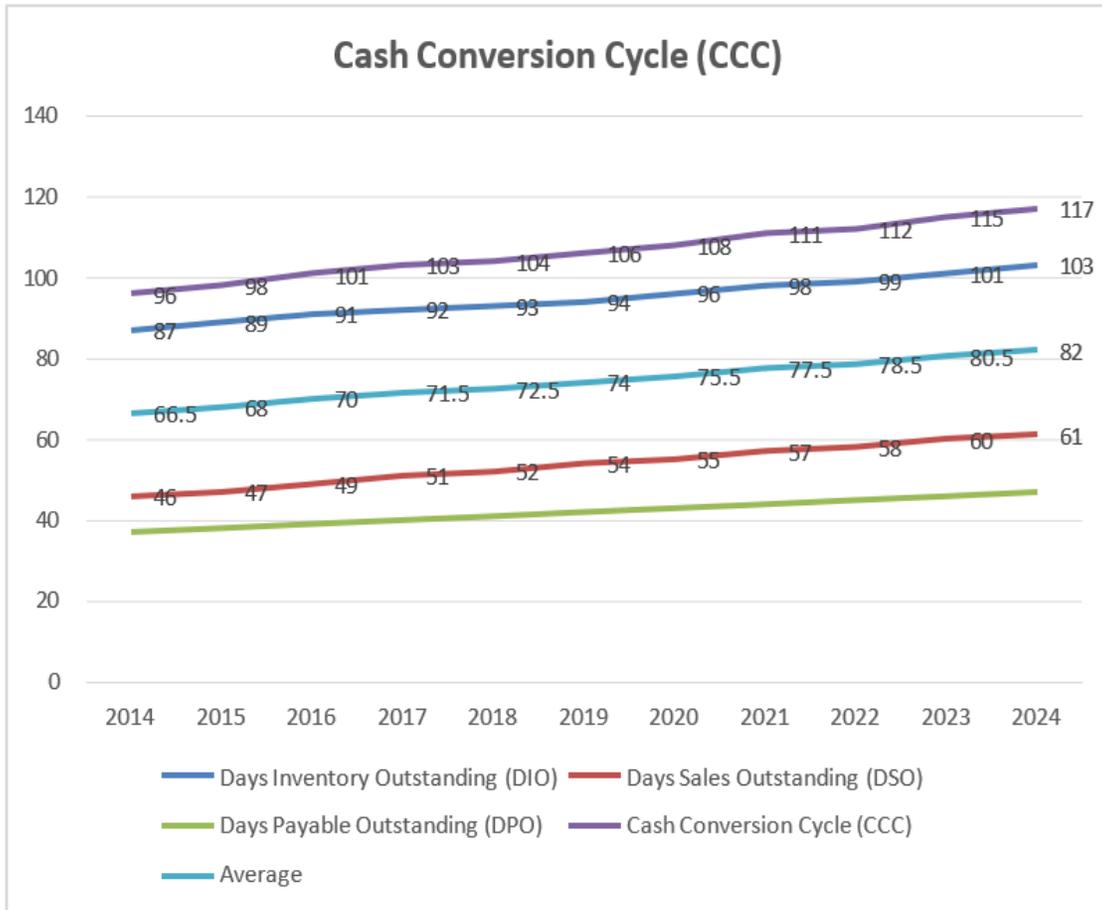
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Cash Conversion Cycle (CCC)

| Year | Days Inventory Outstanding (DIO) | Days Sales Outstanding (DSO) | Days Payable Outstanding (DPO) | Cash Conversion Cycle (CCC) | Average(%) |
|-------------|---|-------------------------------------|---------------------------------------|------------------------------------|-------------------|
| 2014 | 87 | 46 | 37 | 96 | 66.50 |
| 2015 | 89 | 47 | 38 | 98 | 68.00 |
| 2016 | 91 | 49 | 39 | 101 | 70.00 |
| 2017 | 92 | 51 | 40 | 103 | 71.50 |
| 2018 | 93 | 52 | 41 | 104 | 72.50 |
| 2019 | 94 | 54 | 42 | 106 | 74.00 |
| 2020 | 96 | 55 | 43 | 108 | 75.50 |
| 2021 | 98 | 57 | 44 | 111 | 77.50 |
| 2022 | 99 | 58 | 45 | 112 | 78.50 |
| 2023 | 101 | 60 | 46 | 115 | 80.50 |
| 2024 | 103 | 61 | 47 | 117 | 82.00 |

SOURCE: Secondary Data

CHART SHOWING CASH CONVERSION CYCLE



Interpretation

The company’s CCC rose from 96 days in 2014 to 117 days in 2024, reflecting longer cash conversion and potential working capital challenges. DIO increased from 87 to 103 days, DSO from 46 to 61 days, and

DPO from 37 to 47 days, showing slower inventory turnover, receivables collection, and moderately extended supplier payments. Proactive management of inventory, receivables, and payables is needed to improve cash flow and financial performance.



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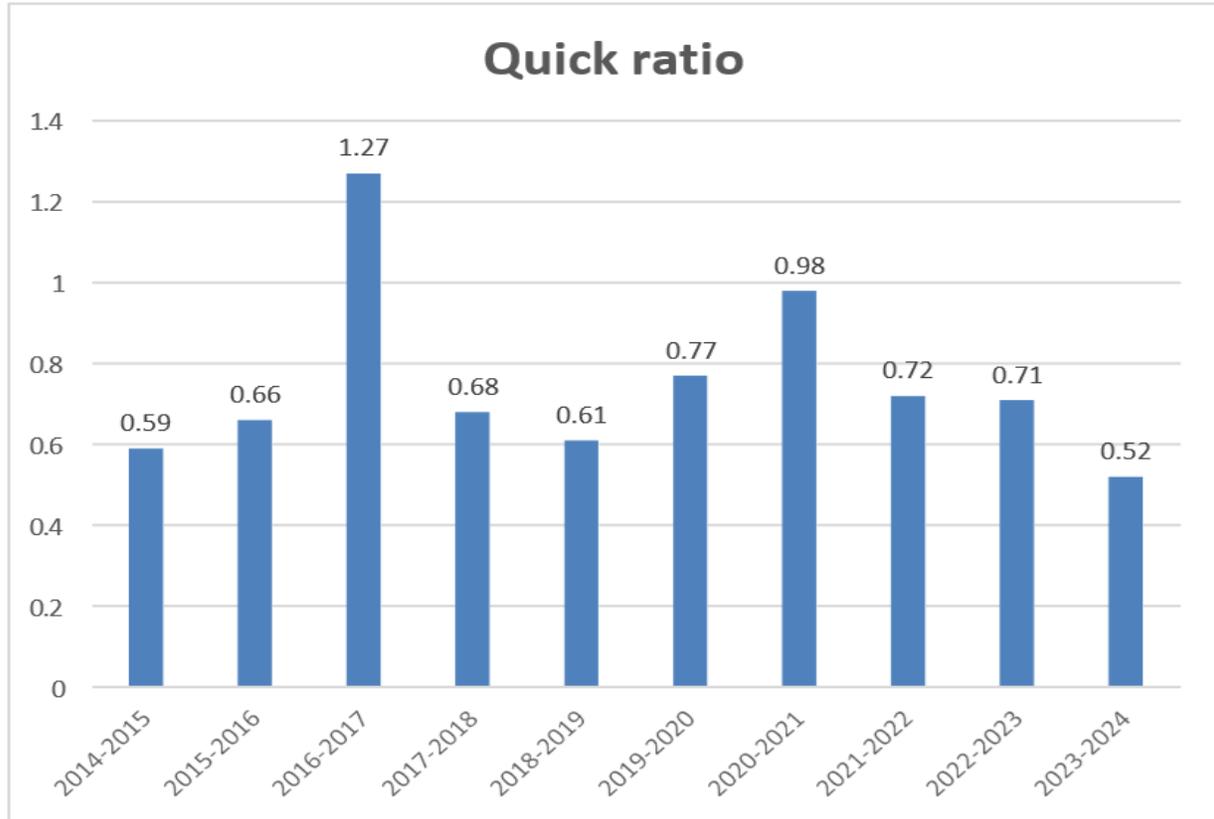
2. Short Term Liquidity Of The Companies And Their Impact Towards Profitability

Quick ratio

| Year | Shree Mahalakshmi Metal Industries |
|-------------|---|
| 2014-2015 | 0.59 |
| 2015-2016 | 0.66 |
| 2016-2017 | 1.27 |
| 2017-2018 | 0.68 |
| 2018-2019 | 0.61 |
| 2019-2020 | 0.77 |
| 2020-2021 | 0.98 |
| 2021-2022 | 0.72 |
| 2022-2023 | 0.71 |
| 2023-2024 | 0.52 |

SOURCE: Secondary Data

CHART SHOWING QUICK RATIO



Interpretation

The quick ratio of Shree Mahalakshmi Metal Industries fluctuated from 0.52 (2023–2024) to 1.27 (2016–2017), remaining below the ideal benchmark of 1 in most years, indicating limited immediate liquidity and reliance on inventory.

The brief peak in 2016–2017 shows temporary strong liquid asset management, but the ratio quickly fell below 1 afterward, declining to 0.52 in the final year. Overall, the trend highlights persistent vulnerability in short-term liquidity, raising concerns about financial flexibility and the ability to meet urgent obligations.



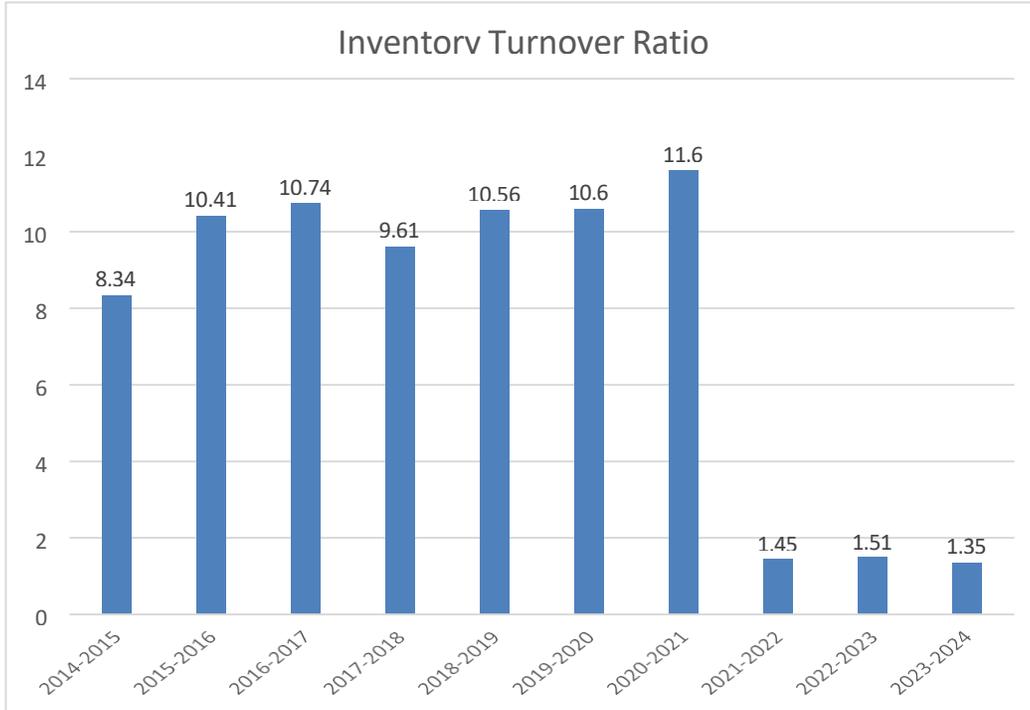
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Inventory Turnover Ratio

| Year | Shree Mahalakshmi Metal Industries |
|-------------|---|
| 2014-2015 | 8.34 |
| 2015-2016 | 10.41 |
| 2016-2017 | 10.74 |
| 2017-2018 | 9.61 |
| 2018-2019 | 10.56 |
| 2019-2020 | 10.6 |
| 2020-2021 | 11.6 |
| 2021-2022 | 1.45 |
| 2022-2023 | 1.51 |
| 2023-2024 | 1.35 |

SOURCE: Secondary Data

CHART SHOWING INVENTORY TURNOVER RATIO



Interpretation

The inventory turnover ratio of Shree Mahalakshmi Metal Industries (2014–2024) shows two phases. From 2014–2015 to 2020–2021, ratios were strong (8.34–11.60), indicating efficient inventory use and fast stock conversion. From 2021–2022 onward, ratios sharply declined to 1.45–1.35, reflecting longer stock holding and reduced efficiency.

This contrast highlights inconsistencies in operational management, likely due to demand changes, supply-chain issues, or working capital policies. While early years show strong inventory control, the recent decline signals inefficiencies and potential strain on liquidity and profitability.

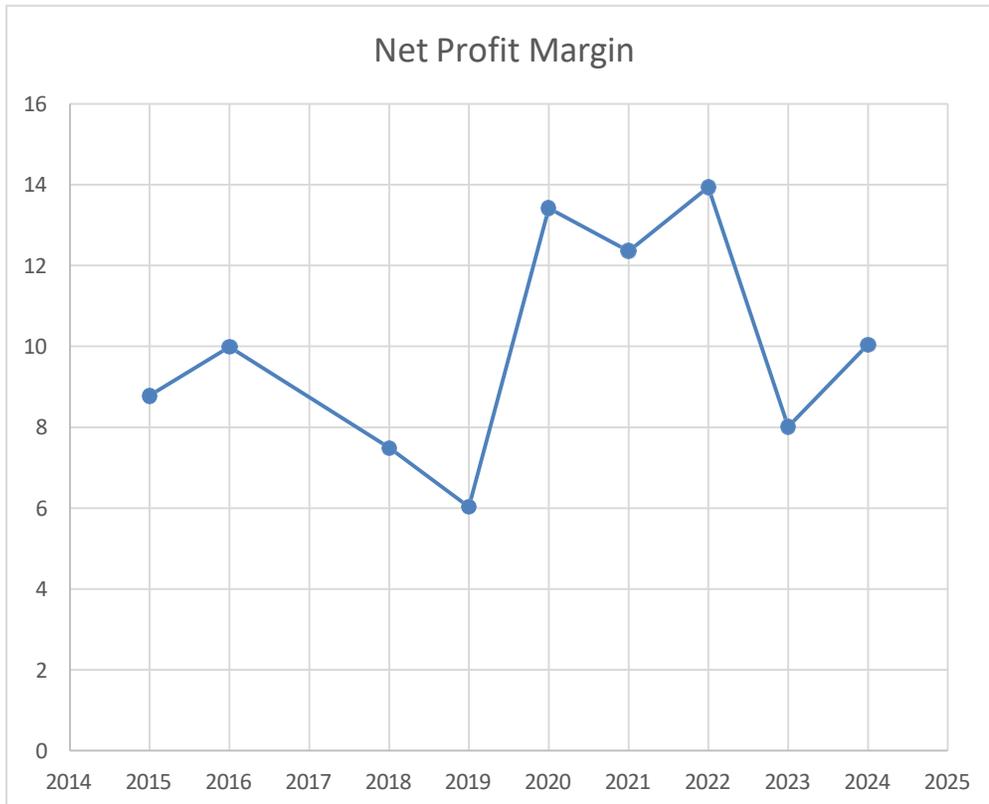


Net Profit Margin

| Year | Shree Mahalakshmi Metal Industries (%) |
|------|--|
| 2015 | 8.78 |
| 2016 | 9.99 |
| 2018 | 7.49 |
| 2019 | 6.03 |
| 2020 | 13.42 |
| 2021 | 12.36 |
| 2022 | 13.94 |
| 2023 | 8.01 |
| 2024 | 10.05 |

SOURCE: Secondary Data

CHART SHOWING NET PROFIT MARGIN





Interpretation

The net profit margin of 2015–2024) fluctuated between 6.03% (2019) and 13.94% (2022), reflecting variable profitability. Early years showed moderate margins (9–10%), declining to 6.03% in 2019 due to cost pressures or reduced efficiency.

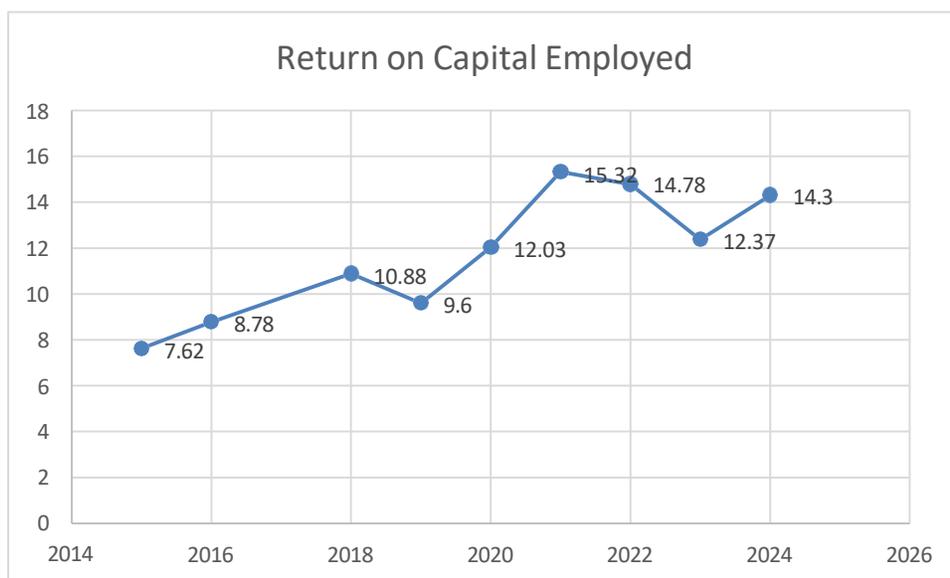
Recovery occurred in 2020–2022, peaking at 13.94%, but margins fell to 8.01% in 2023 before rising to 10.05% in 2024. Therefore, profitability cycles highlight strong earning capacity offset by periods of pressure, indicating exposure to business risks and cost-structure challenges.

Return on Capital Employed

| Year | Shree Mahalakshmi Metal Industries (%) |
|------|--|
| 2015 | 7.62 |
| 2016 | 8.78 |
| 2018 | 10.88 |
| 2019 | 9.6 |
| 2020 | 12.03 |
| 2021 | 15.32 |
| 2022 | 14.78 |
| 2023 | 12.37 |
| 2024 | 14.3 |

SOURCE: Secondary Data

CHART SHOWING RETURN ON CAPITAL EMPLOYED



Interpretation

The ROCE from (2015–2024) showed an upward trend, rising from 7.62% in 2015 to a peak of 15.32% in 2021, with slight dips in 2019 and 2022–2024.

Sustained double-digit ROCE from 2020 onwards reflects improved operational efficiency and effective use of capital, indicating a strong long-term financial position.

Anova Comparison

Impact Of Short Term Liquidity Of The Companies On Net Profit Margin

Significant difference is there between short term liquidity of the companies and Net Profit Margin

| ANOVA ^a | | | | | | |
|--|------------|----------------|----|-------------|-------|-------------------|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 109.715 | 6 | 18.286 | 1.444 | .011 ^b |
| | Residual | 37.986 | 3 | 12.662 | | |
| | Total | 147.700 | 9 | | | |
| a. Dependent Variable: Net Profit Margin | | | | | | |
| b. Predictors: (Constant), Cash Earnings Retention Ratio, Earnings Retention Ratio , Current ratio , Dividend Payout Ratio , Inventory Turnover Ratio, Quick Ratio | | | | | | |

Interpretation

The ANOVA results indicate a significance value (p-value) of .011, which is below the commonly accepted alpha level of 0.05. Based on this finding, we reject the null hypothesis (H_0) and conclude that there is a statistically significant difference between the short-term liquidity of the companies and their Net Profit Margin.

VI. FINDINGS

- The company maintains a moderate inventory turnover ratio showing steady but slightly delayed stock movement
- The Quick Ratio indicate satisfactory short term liquidity meaning the firm can meet its current liabilities efficiently
- The Net Profit Margin reflects consistent profitability with controlled expenses and efficient cost utilization
- The Return on Capital Employed shows effective use of resources and positive returns on invested fund
- The Statistical Model confirms a positive relationship between liquidity ratios and profitability proving that efficient short term management enhances financial performance.

VII. SUGGESTIONS

- Adopt improved inventory forecasting tools to minimize excess stock and reduce carrying costs
- Implement regular review of Liquidity Ratios to maintain balance between Assets and Liabilities
- Encourage faster receivable collections and optimize payable cycles to strengthen cash flow
- Use Cost Reduction Strategies such as Process Automation and Supplier Coordination to control overheads
- Apply Predictive analysis techniques for better Inventory Planning and prevent financial overload during fluctuating market conditions

VIII. CONCLUSION

The study concludes that both liquidity and inventory management significantly influence a company's profitability and financial stability. Maintaining an efficient balance between quick ratio inventory turnover and cost control enhances profit margins and reduces financial stress. The firms consistent performance shows that predictive analysis and cost reduction practices can ensure long term sustainability and competitiveness in a dynamic market.



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