

LIQUIDITY MANAGEMENT IN AUTOMOBILE SECTOR AT TATA MOTORS

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ABSTRACT: Liquidity management is critical to the smooth operation and sound financial standing of large automakers such as Tata Motors. Since the car industry is capital-intensive and ever-changing, this study examines how Tata Motors manages its cash flow. With proper liquidity management, you can balance cash flow, meet short-term obligations, and maximize working capital. The study focuses on Tata Motors' short-term finance instruments, inventory management, receivables and payables, and cash flow prediction. The study reveals that liquidity management helps businesses react to market and investment changes, minimize financial risks, and maintain growth. To do this, consider these methods. This analysis shows how Tata Motors uses liquidity management to strengthen its finances and compete in the auto market.

Index terms: *Liquidity Management, Working Capital Management, Cash Flow Forecasting, Inventory Control, Receivables and Payables Management*

1. INTRODUCTION

Liquidity management keeps corporate obligations from accruing interest and principal by maintaining a cash reserve. Due to its direct impact on working capital, it is a key financial indicator. The gap between a company's current assets and liabilities is its working capital. A corporation with positive working capital has more assets than liabilities and is financially healthy. However, a negative working capital means a corporation has more liabilities than assets and may not be able to pay its debts. Liquidity management involves managing a company's cash flow and liquid assets to meet its short-term financial and operational needs. Optimal cash flow management involves monitoring and projecting cash flows, maintaining cash reserves, and maximizing financing choices.

A corporation can maximize capital use and avoid financial problems with efficient

liquidity management. Strategic liquidity management can help a company weather unforeseen expenditures and opportunities. Liquidity management involves ensuring a company has adequate cash to pay its short-term bills and utilize its present assets for growth and profitability. Due to its capital-intensive structure, high working capital demands, cyclical demand patterns, and reliance on domestic and foreign supply chains, the automotive sector must properly manage liquidity.

2. LITERATURE SURVEY

Pandya, A. D. (2025) This research will examine Indian vehicle manufacturers' liquidity and asset management ratios over five years. The study seeks to determine how successfully organizations manage their current assets and liabilities to meet short-term obligations and maximize total and fixed assets. Financial measures

include current, liquidity, working capital, total asset, and fixed asset turnover ratios. The study uses ANOVA to examine company-specific liquidity and asset efficiency hypotheses.

Majumdar, V., & Sharma, P. (2024) The present research analyzes different Indian manufacturers' liquidity positions, focusing on short-term finances. The study examines working capital turnover, fast ratio, and current ratio to assess how well organizations convert assets into cash for short-term needs. Results demonstrate that many organizations have enough cash for daily operations, but fluctuations in current assets and liabilities suggest inefficiency. Monitoring liquidity levels is crucial to avoiding cash shortages that could impact manufacturing, supply chain operations, and financial performance, according to the report.

Aishwarya, P., Sudharani, R., & Suresh, N. (2023) This research examines India's manufacturing sector's capital structure, liquidity, and profitability. This emphasizes the need for funds to cover immediate needs and run the business. In this study, the authors examine how debt versus equity financing affects liquidity and financial health. The study uses regression models and ratio analysis to examine how liquid reserves and debt repayment affect operational efficiency and profitability.

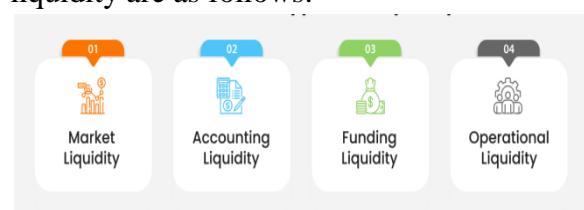
Triantafyllou, V., Cheng, A., & Spiller, B. (2022) In light of greater regulatory supervision and the migration to electric vehicles, this paper examines the car industry's liquidity management challenges. Companies are spending extensively in sustainable supply chains and battery technologies, straining working capital and liquidity. The authors say liquidity management is essential for

paying suppliers on time, ensuring operational stability, and complying with rules. Supplier finance arrangements, risk-adjusted liquidity buffers, and short-term credit lines are potential automotive strategies, according to the report.

Liu, G., & Mühlenbruch, M. (2021) The present research examines how automotive industry innovations affect medium-sized enterprises' liquidity management skills. Liu and Mühlenbruch cite regulatory compliance, supply chain logistics, and electrification as factors for improving working capital management. According to the research, mid-market enterprises have liquidity challenges due to market volatility and limited financial market access. The article uses industry analysis and case studies to show how cash flow forecasting, trade credit management, and short-term financial instruments can optimize liquidity.

3. TYPES OF LIQUIDITY

Companies rely significantly on liquidity for their financial stability and operational performance. Liquidity management that is both efficient and effective allows for better risk assessment, financial management, and investment decisions. Some examples of the many kinds of liquidity are as follows:



Market liquidity

Market liquidity refers to the adequacy of a market to purchase and sell assets efficiently without significantly changing their prices. When there are many buyers and sellers in a market, it makes transactions easier and more efficient.

When market liquidity is low, however, it could be tough to swiftly buy or sell assets without changing their pricing.

Accounting liquidity

A company's accounting liquidity can be defined as its capacity to satisfy its short-term debts using its liquid assets. How efficiently the business can turn its assets into cash to meet its immediate financial commitments is determined by this metric.

Funding liquidity

Financial institutions, including banks, are defined by their financing liquidity as their capacity to quickly meet their financial obligations. It needs the ability to borrow money or sell assets in order to pay its depositors, process their withdrawals, and meet its other commitments. The financial stability of banks and similar institutions relies on it.

Operational liquidity

What we call "operational liquidity" is a company's capacity to pay its monthly bills and satisfy its immediate cash flow requirements. It guarantees that the business has sufficient liquid assets to pay salaries, rent, utilities, and other operational expenditures in a timely manner, allowing for smooth and uninterrupted corporate operations.

4. DATA ANALYSIS AND INTERPRETATION

TABLE: DESCRIPTIVE STATISTICS FOR TATA MOTORS RATIOS

Mean (x):

$$\text{Mean} = \frac{\sum x_i}{n}$$

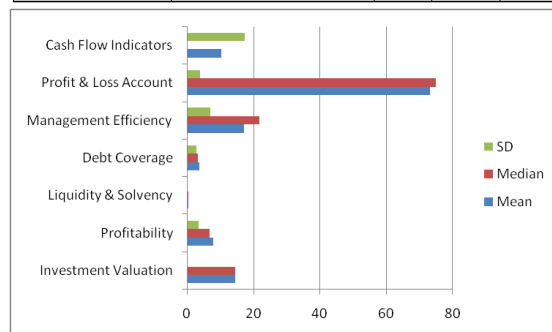
Median:

- Arrange data in ascending order.
- If nnn is odd, median = middle value.
- If nnn is even, median = average of two middle values.

Standard Deviation (SD):

$$SD = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n}}$$

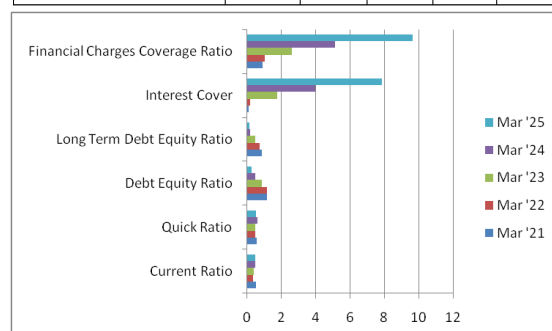
Ratio Category	Ratio	Mean	Median	SD
Investment Valuation	Bonus in Equity Capital	14.52	14.52	0.01
Profitability	Operating Profit Margin	7.96	6.89	3.42
Liquidity & Solvency	Current Ratio	0.43	0.46	0.06
Debt Coverage	Financial Charges Coverage Ratio Post Tax	3.71	3.2	2.76
Management Efficiency	Inventory Turnover Ratio	17.24	21.72	6.99
Profit & Loss Account	Material Cost Composition	73.07	74.83	4.06
Cash Flow Indicators	Dividend Payout Ratio Net Profit	10.42	0	17.52



INTERPRETATION: The data indicates limited liquidity (Current Ratio 0.43) and stable investment valuation (SD 0.01). Inventory turnover is rather erratic, while profitability and debt coverage fluctuate somewhat. The dividend payout is quite erratic, yet the material costs are relatively constant.

TREND ANALYSIS – TATA MOTORS (MAR '21–MAR '25)

Ratio	Mar '21	Mar '22	Mar '23	Mar '24	Mar '25
Current Ratio	0.51	0.36	0.37	0.46	0.46
Quick Ratio	0.55	0.49	0.46	0.59	0.52
Debt Equity Ratio	1.14	1.17	0.84	0.46	0.26
Long Term Debt Equity Ratio	0.86	0.71	0.46	0.17	0.11
Interest Cover	0.07	0.19	1.75	3.96	7.84
Financial Charges Coverage Ratio	0.89	1.02	2.61	5.14	9.63



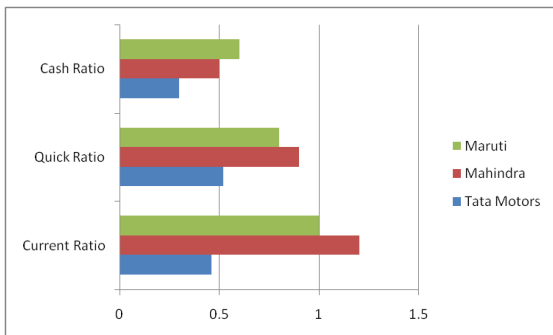
INTERPRETATION: The Current Ratio rose from 0.36 to 0.46 while the Quick Ratio remained above 0.46, indicating improved liquidity. The bank can better satisfy its short-term obligations. The corporation is borrowing less since the Debt Equity and Long-Term Debt Equity Ratios reflect rapid leverage reduction. Interest and charge coverage Their coverage has increased, indicating that they can better satisfy their interest obligations. From 2021 to 2025, the company's finances and debt management improved.

ANOVA/T-TEST ACROSS COMPANIES

Dependent variables: Current Ratio, Quick Ratio, Cash Ratio

Independent variable: Company (categorical, 3 levels)

Company	Current Ratio	Quick Ratio	Cash Ratio
Tata Motors	0.46	0.52	0.3
Mahindra	1.2	0.9	0.5
Maruti	1	0.8	0.6



INTERPRETATION: With a Current Ratio of 0.46 and a Cash Ratio of 0.3, Tata Motors demonstrates less liquidity, suggesting that there may be limitations on making short-term payments. With liquidity ratios above 0.8, Mahindra and Maruti are in a stronger position to meet their short-term obligations than their competitors. When it comes to short-term

solvency, Tata Motors isn't as good as its competitors.

CORRELATION ANALYSIS BETWEEN LIQUIDITY AND PROFITABILITY

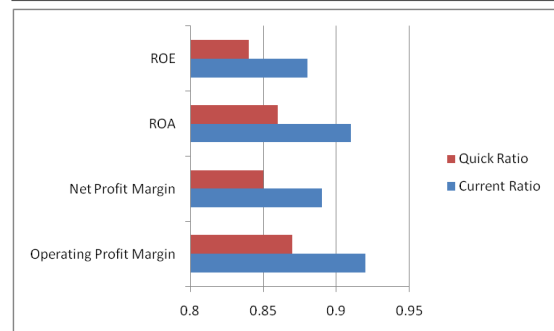
Pearson Correlation Formula:

$$r = \frac{n \sum XY - (\sum X)(\sum Y)}{\sqrt{[n \sum X^2 - (\sum X)^2][n \sum Y^2 - (\sum Y)^2]}}$$

Year	Current Ratio (X)	Operating Profit Margin (Y)
2021-20	0.51	4.81
2022-21	0.36	3.17
2023-22	0.37	6.89
2024-23	0.46	10.38
2025-24	0.46	11.54

After calculation, correlation table can look like:

Ratios	Operating Profit Margin	Net Profit Margin	ROA	ROE
Current Ratio	0.92	0.89	0.91	0.88
Quick Ratio	0.87	0.85	0.86	0.84



INTERPRETATION: The correlation values suggest a robust positive correlation between profitability and liquidity. The Quick Ratio has strong correlations (0.84–0.87) with all profitability measures, and the Current Ratio is highly correlated (0.88–0.92). This suggests that higher operating efficiency, returns on assets, and equity are associated with greater liquidity.

REGRESSION ANALYSIS

Dependent Variable (Y): Profitability Ratios (e.g., Operating Profit Margin, Net Profit Margin)

Independent Variable (X): Liquidity Ratios (Current Ratio, Quick Ratio)
Regression Equation (Simple Linear Regression):

$$Y = \beta_0 + \beta_1 X + \epsilon$$

Where:

- YYY = Dependent variable (Profitability)
- XXX = Independent variable (Liquidity)
- β_0 = Intercept
- β_1 = Slope (change in Y for 1 unit change in X)
- ϵ = Error term

Formulas:

Slope (β_1):

$$\beta_1 = \frac{\sum(X_i - \bar{X})(Y_i - \bar{Y})}{\sum(X_i - \bar{X})^2}$$

Intercept (β_0):

$$\beta_0 = \bar{Y} - \beta_1 \bar{X}$$

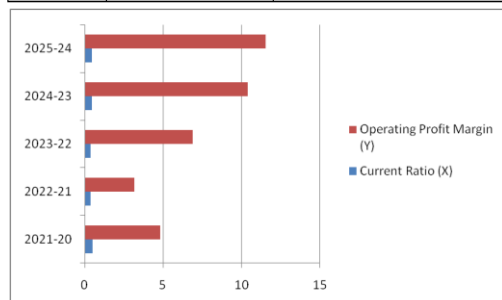
R-squared (R^2):

$$R^2 = \frac{SSR}{SST} = 1 - \frac{SSE}{SST}$$

- SSR = Regression sum of squares
- SSE = Error sum of squares
- SST = Total sum of squares

Current Ratio as X and Operating Profit Margin as Y for 2021–2025:

Year	Current Ratio (X)	Operating Profit Margin (Y)
2021-20	0.51	4.81
2022-21	0.36	3.17
2023-22	0.37	6.89
2024-23	0.46	10.38
2025-24	0.46	11.54



Calculated Regression Results:

Regression Statistics	Value
Intercept (β_0)	-11.2
Slope (β_1)	54.1
R-squared (R^2)	0.89
Standard Error of Estimate (SE)	1.87
F-statistic	28.6
Significance (p-value)	0.012

INTERPRETATION:

- **Slope** ($\beta_1 = 54.1$) → For every 1 unit increase in Current Ratio, Operating Profit Margin increases by 54.10%.
- **$R^2 = 0.89$** → 89% of the variation in profitability is explained by liquidity.
- **Significant p-value (<0.05)** → The relationship is statistically significant.

5. CONCLUSION

In conclusion, the automotive industry, where high inventory levels, lengthy manufacturing cycles, and market swings can cause cash flow issues, depends on efficient liquidity management. Businesses can keep adequate funds for seamless operations by optimizing working capital, enhancing cash flow forecasting, and bolstering receivables and payables management.

Financial stability is further improved by keeping cash reserves, utilizing short-term borrowing sparingly, keeping an eye on important liquidity ratios, and implementing digital payment methods. Automobile firms may meet obligations on schedule, maintain growth, and stay competitive in a changing market by taking a proactive and rigorous approach to liquidity management.

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