IMPACT OF LIQUIDITY ON THE PROFITABILITY OF THE FIRM- A STUDY OF INDIAN AUTOMOBILE INDUSTRY

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ABSTRACT: The Indian automobile industry stands as a cornerstone of the nation's economy, making substantial contributions to manufacturing GDP and overall economic growth. Notably, it accounts for 49% of the manufacturing GDP and approximately 7.5% of the total GDP, indicating its significant economic footprint. Fueled by skilled and competitive firms, the industry drives innovation, infrastructure development, and substantial employment opportunities. Despite facing challenges such as economic fluctuations and global competition, the industry demonstrates resilience and potential for sustained growth. Within financial management, liquidity and profitability emerge as pivotal factors for success, intertwining short-term survival with long-term sustainability. Addressing a research gap regarding the liquidity-profitability relationship, the study meticulously examines this nexus within the Indian automobile industry through panel data analysis. Results reveal a nuanced correlation, with liquidity positively associated with stringent measures like the quick ratio and operating cash flow, but negatively correlated with broader measures such as the current ratio. These findings underscore the critical role of liquidity management in enhancing performance and competitiveness within the industry, offering valuable insights for strategic decision-making.

Index Terms: Liquidity, Profitability, Automobile industry

I. Introduction

The Indian automobile industry is a vital component of the nation's economy, playing a pivotal role alongside other major sectors such as iron and steel, textiles, cement, petrochemicals, IT, and banking. Over the last four decades, this industry has consistently maintained its position as one of the top manufacturing sectors, making substantial contributions to the country's economic growth and development. This sector's significance is underscored by its substantial contribution to India's manufacturing Gross Domestic Product (GDP), accounting for a notable 49%. Moreover, it also contributes significantly to the overall GDP, contributing around 7.5%. This indicates the substantial economic footprint of the automobile industry within India. One of the key drivers behind the industry's growth and success is the presence of skilled and competitive firms. These companies have been instrumental in propelling the industry forward, driving innovation, and ensuring global competitiveness. The industry's growth has not only bolstered economic indicators but has also played a crucial role in enhancing the nation's infrastructure. The development of roads, highways, and ancillary services has been spurred by the expansion of the automobile industry. Furthermore, the industry serves as a major employment generator, providing millions of job opportunities across various segments of the value chain, from manufacturing to sales and service. This employment generation aspect is critical for inclusive economic growth and social development. Moreover, the Indian automobile industry has been at the forefront of technological advancements, particularly in areas such as

artificial intelligence and electric vehicles. Research and development initiatives within the industry have led to significant innovations, driving efficiency improvements, and sustainability initiatives. Despite its numerous contributions and successes, the Indian automobile industry is not without its challenges. Economic fluctuations, policy changes, market demand volatility, and global competition pose constant challenges to industry players. However, the resilience demonstrated by the sector in overcoming these challenges underscores its adaptability and potential for sustained growth. Within the context of the industry's financial management, liquidity and profitability emerge as critical factors for a company's success. Liquidity ensures that a company has sufficient cash reserves to meet its short-term obligations and operational needs. On the other hand, profitability measures how effectively a company generates returns from its operations. These two factors are intricately linked, as liquidity is essential for short-term survival, while profitability is crucial for long-term sustainability and growth. Achieving the right balance between liquidity and profitability requires effective financial management practices. This includes managing working capital efficiently, adapting to changing market dynamics, and implementing sound financial strategies.

II. Review of literature

Several studies concentrate on the Indian automobile sector, highlighting its significant contribution to the country's economy and its emergence as a global player.

Adnan & Kamran (2019) focus on liquidity's impact on profitability within the Pakistan automobile industry. They find a positive correlation between quick ratio and profitability, but a negative relationship between current ratio and cash ratio with profitability. This implies that maintaining a certain level of liquidity, especially through quick assets, is beneficial for profitability in the Pakistan automobile sector.

Ali. A. (2021) observes substantial variations in profitability among leading Indian automobile companies and emphasizes the importance of reducing costs and optimizing capital structure for enhanced performance.

Arumugam, D., Kumar, A., & Preetha, R. (2016). underscore the critical role of operational efficiency, particularly operating ratio, in driving profitability within the Indian automobile industry.

Hiran, S. (2016). delves into the impact of liquidity and leverage ratios on profitability for Indian automobile companies, revealing complex relationships between these factors and profitability.

Kaur, N., & Kaur, J. (2016). identify various determinants of profitability within the Indian automobile industry, including liquidity, firm growth, and debt equity ratio, shedding light on factors influencing financial performance.

Kumar, K. K., & Jagadeesh, K. K. analyze the relationship between liquidity and profitability over a decade, suggesting that while liquidity management is essential, its impact on profitability might be insignificant in the Indian automobile industry.

Noor, A., & Lodhi, S. (2015). investigate the impact of liquidity ratios on profitability in the automobile sector in Karachi, Pakistan, emphasizing the importance of liquidity management for financial performance.

Ramanuj, J., & Memon, S. (2023). examine liquidity and profitability across selected Indian automobile companies, finding no statistically significant relationship between liquidity and profitability ratios.

Reddy, S. P., & Mariyappa, M. G. (2022). delve into the nuanced relationship between liquidity and profitability among Indian automobile companies, highlighting the lack of uniformity in this relationship across the sector.

Sharma (2011) conducts a financial analysis of leading Indian automobile companies, evaluating their performance across various financial parameters and offering suggestions for improvement.

Sharma, S., & Verma, M. S. analyze the determinants of profitability among the top five listed Indian automobile companies, highlighting the significant impacts of liquidity, capital structure, and leverage on profitability.

III. Research gap

Based on the literature provided, the research gap seems to lie in the lack of consensus or consistency regarding the relationship between liquidity and profitability in the automobile industry across different regions in the current period.

IV. Objective of the study

The present study has focused to fulfill the above research gap. The objective of the present study is to examine the relationship between liquidity and profitability in the automobile industry over the study period.

V. Research Methodology

The study is based on secondary data. Secondary data on different performance parameters of selected automobile companies had been collected from their published annual reports. CMIE PROWESS DATABASE had also been used for secondary data collection. Data has been analyzed through SPSS and E-Views. Microsoft Office Excel was used to compile and summarize the entire database. The study period is 1st April, 1999 to 31st March, 2023. Sample companies were selected on territorial basis as well as on the availability of data. Three major automobile manufacturing clusters exists in India i.e., northern cluster, southern cluster and western cluster. From northern cluster, selected companies were Maruti Suzuki, Hero

Moto Corp, SML ISUZU and Eicher Motors; from southern cluster, selected companies were TVS Motors and Ashok Leyland; from western Cluster, Mahindra & Mahindra, Tata Motors, Force Motors and Atul Auto were selected. Different statistical tools like mean, standard deviation, correlation coefficient, regression analysis etc. had been used to analyze the collected data.

VI. Data analysis

To explore the relationship between liquidity and profitability, this study employed panel data analysis, analyzing liquidity ratios and profitability ratios of the chosen automobile companies. Augmented Dickey Fuller test was conducted on all variables to prevent spurious regression results. The findings from Table I indicate that all variables were stationary, suggesting that the results obtained were robust.

Table I: Result of Augmented Dickey Fuller test of selected automobile companies in India for the period 1999 to 2023

Variables	At Levels		First Difference	
	Unadjusted t	Adjusted t	Unadjusted t	Adjusted t
Current Ratio	-6.293*	-	-	-
Quick Ratio	-6.492*	-	-	-
Operating cash flow to Current liabilities	-6.074*	-	-	-

To assess the presence of multicollinearity, a correlation matrix was constructed, incorporating both the dependent variable, return on capital employed, and the independent variables: current ratio, quick ratio, and operating cash flow to current liabilities ratio. Pearson correlation coefficients were utilized to evaluate the relationship between return on capital employed and the liquidity ratios of selected automobile companies in India. Table II presents the correlation matrix of all variables involved in the analysis, computed based on data from 10 firms over 24 years. The table reveals significant correlation coefficients for all independent variables. These correlations were carefully considered in the regression analysis to mitigate multicollinearity issues across various models. Notably, the independent variables across different models did not exhibit severe multicollinearity. Furthermore, the correlation analysis highlighted significant negative correlation between return on capital employed and current ratio, whereas return on capital employed demonstrated significant positive correlation with quick ratio and operating cash flow to current liabilities ratio. However, as correlation solely indicates linear relationships with ROCE, it may not offer a reliable indicator of association. Hence, regression analysis was conducted for a more comprehensive understanding.

Table II: Pearson Correlation Coefficient between variables of Selected Automobile Companies in India for the period 1999 to 2023

		ROCE	CR	QR	OCF2CL	DE	PR.P	LTD2CE	DT	TAT	It
ROCE	Pearson Correlation	1			.						
CR	Pearson Correlation	0.04***	1								
QR	Pearson Correlation	.167*	.919**	1							
OCF2CL	Pearson Correlation	.481**	.191**	.218**	1						

*Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

In the regression analysis, the company's performance, as measured by Return on Capital Employed (ROCE), served as the dependent variable, while the independent variables comprised the current ratio, quick ratio, and operating cash flow to current liabilities ratios. Table III displays the regression outcomes concerning the relationship between ROCE and the financial performance of selected automobile companies in India, using both Fixed Effect Model (FEM) and Random Effect Model (REM). To determine the appropriate model, the Hausman Test was conducted, revealing statistically significant test statistics as

shown in Table IV. Consequently, the regression results from the FEM were utilized for statistical inference and further examination of individual coefficients. The regression results are outlined below:

$ROCE_{it} = \beta 0 + \beta 1 (CR)_{it} + \beta 2 (QR)_{it} + \beta 3 (OCF2CL)_{it}$
Estimated regression equation
$\qquad R^2 = 0.734\ ^* \qquad\qquad DW = 0.970$
$\qquad\quad (65.044)$
$ROCE_{it} = 31.29^* - 20.45(CR)^* + 17.93(QR)^* + 6.309(OCF2CL)^*$

Based on the empirical findings, the equation exhibited a good fit, explaining over 70% of the relationship. No autocorrelation issue was detected (DW<1). Return on Capital Employed (ROCE) displayed a negative association with the current ratio, while demonstrating positive correlations with the quick ratio and the OCF-CL ratio. Interpreting these relationships, it can be inferred that ROCE exhibited an inverse relationship with overall liquidity. A high current ratio suggests ample liquidity. The negative correlation between ROCE and the current ratio indicates that as liquidity increased, ROCE decreased. Conversely, the quick ratio, which offers a stricter measure of liquidity by excluding inventory from current assets, showed a positive correlation with ROCE. This suggests that as liquidity, as measured by the quick ratio, increased, so did ROCE. Similarly, a higher OCF to CL ratio indicates a better ability to cover short-term liabilities with operating cash flow, indicating higher liquidity. The positive correlation between ROCE and this ratio further implies that as liquidity increased, as indicated by the OCF to CL ratio, ROCE also increased. Thus, the relationship between ROCE and liquidity appears somewhat mixed but tends towards a positive correlation with stricter liquidity measures like the quick ratio and OCF to CL ratio, and a negative correlation with broader liquidity measures such as the current ratio.

Table III: Regression result of Fixed Effect Model and Random Effect Model of Selected automobile Companies in India for the period 1999 to 2023 Panel regression results: (Dependent Variable: ROCE)

	Fixed Effect Model		Random Effect Model	
	coefficient	t stat	coefficient	t stat
Intercept	31.29	4.63*	23.35	4.99*
CR	-20.45	(4.78)*	-4.81	(1.51)
QR	-17.932	4.32*	5.77	1.77***
OCF2CL	6.309	2.05*	7.63	3.85*

Table IV: Result of Tests for Selection of Appropriate Model of Selected automobile companies in India for the period 1999 to 2023

Purpose	Null Hypothesis	Test	Test Statistics
Selection between Fixed Effects Model and Random Effects Model	Difference in coefficients is not systematic	Hausman Test	χ2 (9)=100.4*

*Note: * 1% Significance level; ** 5% Significance level; *** 10% Significance level;*

Therefore, the study shows that the performance of the selected automobile companies had significant relationships with different ratios measuring liquidity which implies that performance of automobile companies largely depends on the liquidity position.

VII. Conclusion

In conclusion, the examination of the relationship between liquidity and profitability within the selected automobile companies in India has been conducted meticulously through panel data analysis. The study employed the Augmented Dickey Fuller test to ensure the absence of spurious regression results, with all variables demonstrating stationarity, affirming the reliability of the obtained results. Additionally, to address multicollinearity concerns, a correlation matrix was constructed, revealing significant correlations between the dependent variable, return on capital employed (ROCE), and the independent variables representing liquidity ratios. Regression analysis further elucidated the relationship between ROCE and the liquidity ratios, demonstrating a well-fitted equation with an explanatory power exceeding 70%. Notably, ROCE exhibited a negative correlation with the current ratio while displaying positive correlations with the quick ratio and operating cash flow to current liabilities ratio. These findings indicate that as liquidity increases, ROCE tends to decrease, suggesting a nuanced relationship between liquidity and profitability. Specifically, the study highlights a positive correlation between ROCE and more stringent measures of liquidity, such as the quick ratio and operating cash flow to current liabilities ratio, while indicating a negative correlation with broader liquidity measures like the current ratio. This nuanced relationship underscores the importance of considering various liquidity indicators when assessing the performance of automobile companies. Overall, the study underscores the significant impact of liquidity on the performance of selected automobile companies in India, emphasizing the critical role of liquidity management in achieving sustainable profitability. By providing insights into the complex dynamics between liquidity and profitability, the study offers valuable implications for strategic decision-making within the automobile industry, emphasizing the importance of maintaining an optimal liquidity position to enhance overall performance and competitiveness.

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