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Research Article

Working Capital Management and Profitability: Evidence from Indian MSMEs

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Abstract

This study examines the relationship between working capital management (WCM) and profitability in Indian Micro, Small, and Medium Enterprises (MSMEs). Using data from the Reserve Bank of India's surveys and financial statements of 250 MSMEs across manufacturing and service sectors from 2019-2023, we analyse how components of the cash conversion cycle impact return on assets (ROA) and return on equity (ROE). Our findings reveal a significant negative relationship between the cash conversion cycle and profitability metrics, suggesting that efficient working capital management enhances MSME profitability. The study contributes to the limited empirical evidence on Indian MSMEs and provides practical insights for managers and policymakers.

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1. INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) form the backbone of the Indian economy, contributing approximately 30% to the GDP and employing over 110 million people (Ministry of MSME, 2023) [5]. Despite their crucial role, MSMEs face persistent challenges in financial management, particularly in working capital optimisation. Unlike large corporations with access to diversified funding sources, MSMEs operate with limited resources and face significant liquidity constraints that directly impact their survival and growth prospects. Working capital management involves the administration of current assets and current liabilities to ensure sufficient cash flow for meeting short-term obligations and operational expenses (Deloof, 2003) [1]. Efficient WCM is particularly critical for MSMEs given their limited access to external financing, higher cost of capital, and vulnerability to market fluctuations. The COVID-19 pandemic further highlighted the importance of robust working capital management, as many MSMEs faced severe liquidity crises due to disrupted supply chains and delayed receivables.

The relationship between working capital management and firm profitability has been extensively studied in developed economies, with seminal works by Shin and Soenen (1998) [9] and Deloof (2003) [1] establishing negative associations between the cash conversion cycle and profitability. However, research specific to Indian MSMEs remains limited, despite their unique operational characteristics, regulatory environment, and market dynamics that differ substantially from large corporations and firms in developed countries.

1.1 RESEARCH OBJECTIVES

This study aims to:

1. Examine the relationship between working capital management components and profitability in Indian MSMEs
2. Analyse the impact of cash conversion cycle on return on assets and return on equity
3. Identify sector-specific variations in working capital efficiency
4. Provide empirical evidence to support working capital optimization strategies for MSME managers

1.2 SIGNIFICANCE OF THE STUDY

This research addresses a critical gap in the literature by focusing exclusively on Indian MSMEs, a segment that operates under distinct constraints compared to large enterprises. The findings have practical implications for MSME managers seeking to optimise working capital, financial institutions designing credit products, and policymakers formulating support mechanisms for the MSME sector.

2. LITERATURE REVIEW

The theoretical foundation for studying working capital management stems from the risk-return trade-off principle. Firms must balance liquidity (maintaining sufficient current assets) against profitability (minimising idle resources). This fundamental tension has spawned extensive research examining optimal working capital policies.

Shin and Soenen (1998) [9] pioneered empirical analysis using the cash conversion cycle as a comprehensive measure of working capital efficiency. Their study of US firms established that shorter cash conversion cycles correlate with higher profitability, suggesting that reducing the time gap between cash outflows and inflows enhances shareholder value. Deloof (2003) [1] corroborated these findings using Belgian firm data, demonstrating that managers can create value by reducing the number of days accounts receivable and inventories, while carefully managing accounts payable.

In the Indian context, Sharma and Kumar (2011) [8] analysed 263 non-financial BSE-listed firms and found significant negative relationships between measures of working capital management and profitability. Gill *et al*. (2010) [4] examined US manufacturing firms and confirmed that efficient working capital management positively affects profitability. More recently, Enqvist *et al*. (2014) [2] demonstrated that the negative relationship between working capital and profitability strengthens during economic downturns, highlighting the importance of working capital efficiency during challenging periods.

Research specific to SMEs reveals distinctive patterns. Padachi (2006) [6] studied Mauritian SMEs and found that high investment in inventories and receivables correlates with lower profitability. García-Teruel and Martínez-Solano (2007) [3] analysed Spanish SMEs and confirmed that reducing the cash conversion cycle enhances firm performance. However, they also noted that very aggressive working capital policies might harm profitability by disrupting operations and supplier relationships. Despite growing interest, research on Indian MSMEs remains sparse. Existing studies often focus on large listed companies, leaving the vast MSME sector underexplored. Given that MSMEs face unique challenges, including limited bargaining power with suppliers and customers, restricted access to formal credit, and higher vulnerability to market shocks, findings from large firm studies may not directly apply to this segment.

3. RESEARCH METHODOLOGY

3.1 Data and Sample Selection

This study utilises secondary data from multiple authentic sources to ensure reliability and comprehensiveness. The primary data sources include:

1. **Reserve Bank of India (RBI) databases**: Financial statements and ratios from RBI's annual surveys on the MSME sector
2. **Ministry of MSME reports**: Annual reports and statistical databases
3. **Centre for Monitoring Indian Economy (CMIE) Prowess database**: Financial data of registered MSMEs
4. **Individual company annual reports**: For detailed component analysis

The sample comprises 250 MSMEs selected through stratified random sampling from manufacturing (60%) and service sectors (40%) operating continuously from 2019 to 2023. This five-year period captures both pre-pandemic and post-pandemic operational dynamics. Firms with incomplete financial data or those undergoing mergers, acquisitions, or major restructuring during the study period were excluded to maintain data consistency.

3.2 Classification of MSMEs

According to the revised MSME classification (effective July 2020), enterprises are categorised based on investment and annual turnover:

Table 1: MSME Classification Criteria

Category	Investment in Plant & Machinery/Equipment	Annual Turnover
Micro	Up to ₹1 crore	Up to ₹5 crore
Small	Up to ₹10 crore	Up to ₹50 crore
Medium	Up to ₹50 crore	Up to ₹250 crore

Source: *Ministry of MSME, Government of India*

Our sample distribution: Micro enterprises (32%), Small enterprises (45%), and Medium enterprises (23%).

3.3 Variables and Measurement

Dependent Variables (Profitability Measures):

1. **Return on Assets (ROA)** = (Net Income / Total Assets) × 100
   - Measures overall efficiency in using assets to generate profits
2. **Return on Equity (ROE)** = (Net Income / Shareholders' Equity) × 100
   - Indicates returns generated for equity shareholders

Independent Variables (Working Capital Management Measures):

1. Cash Conversion Cycle (CCC) = DIO + DSO - DPO
   - Primary measure of working capital efficiency
2. Days Inventory Outstanding (DIO) = (Average Inventory / Cost of Goods Sold) × 365
   - Measures inventory management efficiency
3. Days Sales Outstanding (DSO) = (Average Accounts Receivable / Sales) × 365
   - Measures receivables collection efficiency
4. Days Payables Outstanding (DPO) = (Average Accounts Payable / Cost of Goods Sold) × 365
   - Measures payment period to suppliers

Control Variables

1. Firm Size (SIZE) = Natural logarithm of total assets
2. Sales Growth (GROWTH) = [(Sales_t - Sales_t-1) / Sales_t-1] × 100
3. Debt Ratio (DEBT) = Total Debt / Total Assets
4. Current Ratio (CR) = Current Assets / Current Liabilities

3.4 Statistical Methods

The study employs multiple analytical techniques:

1. **Descriptive Statistics**: Mean, median, standard deviation, and quartile analysis for all variables
2. **Correlation Analysis**: Pearson correlation coefficients to examine bivariate relationships
3. **Panel Regression Analysis**: Fixed effects and random effects models to account for firm-specific characteristics and time effects
4. **Hausman Test**: To determine the appropriate model specification
5. **Robustness Checks**: Alternative profitability measures and lagged independent variables

The general regression model is specified as:

$$Profitability_{it} = \beta 0 + \beta 1(CCC)_{it} + \beta 2(SIZE)_{it} + \beta 3(GROWTH)_{it} + \beta 4(DEBT)_{it} + \beta 5(CR)_{it} + \varepsilon it$$

Where i represents firms, t represents time periods, and ε represents the error term.

4. DATA ANALYSIS AND RESULTS

4.1 Descriptive Statistics

The descriptive analysis provides insights into the working capital management practices and profitability characteristics of Indian MSMEs during the study period.

Table 2: Descriptive Statistics of Key Variables (N=1,250 firm-year observations)

Variable	Mean	Median	Std. Dev.	Min	Max
ROA (%)	8.42	7.85	6.23	-12.4	28.6
ROE (%)	14.67	13.20	11.45	-18.2	52.3
CCC (days)	87.32	82.50	42.18	18.5	234.7
DIO (days)	52.18	48.30	28.64	12.4	156.2
DSO (days)	68.45	64.20	31.27	15.8	182.4
DPO (days)	33.31	30.15	18.93	8.2	98.6
Firm Size (Log)	7.84	7.72	1.15	5.2	11.3
Sales Growth (%)	12.34	10.80	15.62	-28.4	67.8
Debt Ratio	0.58	0.56	0.22	0.12	0.94
Current Ratio	1.64	1.58	0.47	0.68	3.42

Source: Compiled from RBI and CMIE Prowess database

The average ROA of 8.42% and ROE of 14.67% indicate moderate profitability levels among Indian MSMEs. The mean cash conversion cycle of 87.32 days suggests that on average, MSMEs take approximately three months to convert their working capital investments back into cash. Significant variation exists across firms, as evidenced by high standard deviations, indicating diverse working capital management practices. Manufacturing MSMEs exhibited longer cash conversion cycles (average 94.6 days) compared to service sector MSMEs (average 75.4 days), primarily due to higher inventory requirements. The negative minimum values for ROA and ROE reflect firms experiencing losses during certain periods, particularly during 2020-2021, due to pandemic-related disruptions.

4.2 Sector-wise Analysis

Table 3: Sector-wise Working Capital and Profitability Comparison

Metric	Manufacturing (n=750)	Services (n=500)	T-statistic	P-value
Average ROA (%)	7.86	9.34	-3.42	0.001**
Average ROE (%)	13.92	15.89	-2.18	0.029*
Average CCC (days)	94.63	75.41	6.87	0.000***
Average DIO (days)	61.24	38.52	11.24	0.000***
Average DSO (days)	71.38	63.82	3.45	0.001**
Average DPO (days)	37.99	26.93	8.92	0.000***

Note: *** p<0.001, ** p<0.01, * p<0.05 Source: Author's calculations

Service sector MSMEs demonstrate superior profitability metrics and more efficient working capital management. The significantly lower cash conversion cycle in services reflects lower inventory requirements and potentially faster receivables collection. Manufacturing MSMEs, while maintaining longer payment periods to suppliers (higher DPO), still exhibit longer overall conversion cycles due to substantial inventory holding periods.

4.3 Correlation Analysis

Table 4: Pearson Correlation Matrix

	ROA	ROE	CCC	DIO	DSO	DPO	SIZE	GROWTH
ROA	1.000							
ROE	0.782***	1.000						
CCC	-0.426***	-0.381***	1.000					
DIO	-0.358***	-0.312***	0.684***	1.000				
DSO	-0.392***	-0.345***	0.721***	0.423***	1.000			
DPO	0.187**	0.164*	-0.298***	-0.156*	-0.203**	1.000		
SIZE	0.234***	0.189**	-0.267***	-0.198**	-0.245***	0.142*	1.000	
GROWTH	0.445***	0.412***	-0.318***	-0.256***	-0.289***	0.098	0.201**	1.000

Note: *** $p<0.001$, ** $p<0.01$, * $p<0.05$

The correlation matrix reveals significant negative relationships between working capital management measures (CCC, DIO, DSO) and profitability indicators (ROA, ROE). The cash conversion cycle shows a correlation of -0.426 with ROA and -0.381 with ROE, both statistically significant at the 1% level. These preliminary findings suggest that MSMEs with shorter cash conversion cycles tend to achieve higher profitability.

Interestingly, days payables outstanding (DPO) exhibits a positive correlation with profitability, indicating that MSMEs benefiting from extended credit periods from suppliers demonstrate better financial performance. Firm size and sales growth also show positive associations with profitability, consistent with economies of scale and growth opportunities.

4.4 Regression Analysis

Panel regression analysis was conducted to examine the relationship between working capital management and profitability while controlling for firm-specific characteristics. The Hausman test ($\chi^2 = 24.67$, $p < 0.01$) indicated that fixed effects models are more appropriate than random effects models for our dataset.

Table 5: Fixed Effects Panel Regression Results

Independent Variables	Model 1 (ROA)	Model 2 (ROE)
	Coefficient (t-stat)	Coefficient (t-stat)
Constant	18.425*** (6.82)	28.634*** (5.94)
CCC	-0.048*** (-4.73)	-0.082*** (-4.21)
DIO	-0.032** (-2.89)	-0.056** (-2.67)
DSO	-0.041*** (-3.95)	-0.069*** (-3.52)
DPO	0.024* (2.12)	0.038* (1.98)
SIZE	1.234** (3.21)	1.876** (2.87)
GROWTH	0.156*** (5.43)	0.234*** (4.89)
DEBT	-2.845*** (-4.56)	-4.123*** (-3.92)
CR	1.567** (2.74)	2.234** (2.31)
R-squared	0.482	0.437
Adjusted R-squared	0.469	0.423
F-statistic	37.24***	31.86***
Observations	1,250	1,250

Note: *** $p<0.001$, ** $p<0.01$, * $p<0.05$; t-statistics in parentheses

The regression results provide robust evidence supporting the negative relationship between cash conversion cycle and profitability. A one-day reduction in CCC is associated with a 0.048% increase in ROA and a 0.082% increase in ROE, holding other factors constant. These findings are statistically significant and economically meaningful for MSMEs operating with tight margins.

Breaking down the components, both days inventory outstanding and days sales outstanding demonstrate significant negative impacts on profitability. Reducing DIO by one day increases ROA by 0.032% and ROE by 0.056%, while reducing DSO by one day increases ROA by 0.041% and ROE by 0.069%. These results underscore the importance of efficient inventory management and timely receivables collection for MSME profitability.

Conversely, days payables outstanding shows a positive relationship with profitability, suggesting that MSMEs benefit from negotiating longer payment terms with suppliers. However, managers must balance this against maintaining healthy supplier relationships and avoiding excessive reliance on trade credit.

Among control variables, firm size and sales growth positively influence profitability, while debt ratio exhibits a negative relationship, indicating that highly leveraged MSMEs face profitability challenges due to higher interest obligations. The current ratio's positive coefficient suggests that maintaining adequate liquidity supports profitability, contrary to the traditional view that excess liquidity reduces returns.

5. DISCUSSION

The empirical findings align with the broader working capital management literature while revealing specific characteristics of Indian MSMEs. The significant negative relationship between cash conversion cycle and profitability confirms that efficient working capital management constitutes a critical success factor for MSMEs operating in resource-constrained environments.

5.1 Theoretical Implications

Our results support the risk-return trade-off theory in the MSME context. While maintaining higher levels of current assets (inventory and receivables) provides operational flexibility and potentially supports sales growth, it simultaneously ties up scarce financial resources that could otherwise generate returns. The negative impact of extended cash conversion cycles on profitability suggests that Indian MSMEs incur significant opportunity costs when working capital is not managed efficiently.

The positive relationship between days' payables outstanding and profitability warrants careful interpretation. While extended payment periods improve liquidity and reduce financing costs, excessive delays might damage supplier

relationships and result in less favourable terms or disrupted supplies. The optimal strategy appears to involve negotiating reasonable credit terms while maintaining healthy supplier relationships.

5.2 Practical Implications

For MSME managers, these findings offer actionable insights:

Inventory Management: The significant negative impact of DIO on profitability emphasises the need for just-in-time inventory systems, improved demand forecasting, and the elimination of slow-moving stock. Manufacturing MSMEs, in particular, should invest in inventory optimisation technologies and practices.

Receivables Management: The strong negative relationship between DSO and profitability highlights the importance of efficient credit policies, rigorous credit evaluation, proactive collection efforts, and possibly offering early payment discounts to customers. Given the power asymmetry between MSMEs and large corporate customers, industry associations and government support mechanisms could facilitate timely payments.

Payables Management: While extending payment periods benefits profitability, MSMEs should avoid jeopardising supplier relationships. Building collaborative partnerships with key suppliers, negotiating structured payment terms, and maintaining transparent communication can create win-win situations.

Integrated Approach: Rather than managing individual components in isolation, MSMEs should adopt holistic working capital strategies that optimise the entire cash conversion cycle while considering industry norms, competitive dynamics, and stakeholder relationships.

5.3 Policy Implications

For policymakers and financial institutions, several implications emerge:

The Trade Receivables Discounting System (TReDS) platform, introduced by the Government of India, addresses delayed payments to MSMEs by facilitating invoice discounting. Our findings underscore the importance of expanding TReDS adoption and awareness, as reducing DSO significantly enhances MSME profitability.

Financial institutions should design working capital financing products tailored to MSME needs, including inventory financing, receivables factoring, and supply chain financing solutions. Credit assessment models should incorporate working capital efficiency metrics, potentially offering preferential terms to MSMEs demonstrating superior working capital management.

The government's MSME Samadhan portal for delayed payment resolution requires strengthening and enforcement to ensure timely payments from large corporate buyers and government departments. Our analysis demonstrates that even marginal improvements in receivables collection can substantially impact MSME profitability and viability.

5.4 Sector-specific Considerations

The observed differences between manufacturing and service sectors suggest that one-size-fits-all approaches are inappropriate. Manufacturing MSMEs require targeted support for inventory management, including access to warehousing facilities, inventory management software, and industry-specific best practices. Service sector MSMEs might benefit more from receivables management solutions and digital payment infrastructure.

6. Limitations and Future Research

While this study provides valuable insights, several limitations warrant acknowledgement. The sample, though substantial, represents only registered MSMEs with available financial data, potentially excluding informal sector enterprises that constitute a significant portion of India's MSME landscape. The study period includes the anomalous COVID-19 period, which may have distorted typical working capital patterns, though this also provides insights into crisis management.

The research focuses on financial metrics without incorporating qualitative factors such as management quality, industry relationships, and technological adoption that influence both working capital management and profitability. Future research could employ mixed-methods approaches combining quantitative analysis with case studies to understand the mechanisms underlying successful working capital strategies.

Additional research directions include examining non-linear relationships between working capital components and profitability, investigating optimal working capital levels for different MSME categories and industries, analysing the role of digital technologies in improving working capital efficiency, and studying the impact of working capital management on MSME survival rates and growth trajectories.

Cross-country comparative studies examining working capital practices in MSMEs across emerging economies would provide valuable insights into context-specific factors and generalizable principles. Longitudinal studies tracking individual MSMEs over extended periods could reveal how working capital strategies evolve with firm maturity and market conditions.

7. CONCLUSION

This study provides comprehensive empirical evidence on the relationship between working capital management and profitability in Indian MSMEs, addressing a critical gap in the literature. Analysing 250 MSMEs over five years using authentic data from RBI, Ministry of MSME, and CMIE databases, we find robust support for the negative relationship between cash conversion cycle and profitability measures.

The key findings indicate that reducing the cash conversion cycle by one day improves ROA by approximately 0.048% and ROE by 0.082%. Both inventory holding periods and receivables collection periods negatively impact profitability, while extended payables periods contribute positively. These relationships hold after controlling for firm size, sales growth,

leverage, and liquidity, and are consistent across alternative model specifications.

For Indian MSMEs operating in competitive markets with limited access to external financing, efficient working capital management represents not merely an operational concern but a strategic imperative. By optimising inventory levels, accelerating receivables collection, and negotiating appropriate payment terms with suppliers, MSMEs can significantly enhance profitability and strengthen their competitive positions.

The study's findings have practical implications for multiple stakeholders. MSME managers should prioritise working capital optimisation as a key performance driver, adopting systematic approaches to managing the cash conversion cycle. Financial institutions and investors can incorporate working capital efficiency metrics into credit assessment and investment decisions. Policymakers should continue developing infrastructure and platforms that facilitate efficient working capital management, particularly addressing the chronic issue of delayed payments to MSMEs.

As Indian MSMEs navigate increasingly complex and competitive business environments, superior working capital management will distinguish successful enterprises from struggling ones. This research contributes to understanding these dynamics and provides evidence-based guidance for enhancing MSME performance through efficient resource management. The resilience and growth of India's MSME sector, crucial for employment generation and economic development, depend significantly on financial management practices, with working capital optimisation serving as a critical lever for sustainable success.

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