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Working Capital Management and Profitability: Evidence from Indian Manufacturing Firms

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Abstract

Despite the post-COVID-19 period being characterized by liquidity strains and disruptions to the supply chain process, proper working capital management remains vital in ensuring profitability among firms. This study focuses on the impact of working capital management on profitability among manufacturing firms operating in India and listed at the National Stock Exchange (NSE). It uses data of 135 firms across the period of 2022-2024 (405 firm-year observations). The research considers the component-based approach of analyzing working capital management through examining separately accounts receivable turnover, inventory turnover, and accounts payable turnover. In this way, it becomes possible to understand better the influence of particular components of the working capital on profitability under the given conditions. With the help of panel regression analysis taking into account fixed effects at the firm level and lagged variables, the study reveals that receivables and payables management have a significant effect on the profitability of firms, mainly shareholders' measures of profitability. Inventory turnover does not show the significant impact on profitability directly. Furthermore, the research finds that there is a negative correlation between firm size and sales growth and profitability, which might imply some inefficiency when the firm expands.

Keywords: *Working Capital Management, Profitability, Indian Manufacturing Firms, Cash Conversion Cycle, Post-Pandemic Analysis.*

JEL Code: *G31, G32, L25*

Introduction

Following the pandemic of COVID-19, companies all around the world have encountered higher levels of financial uncertainties due to disruptions in supply chain networks, tight liquidity position, and escalating costs of inputs. In such an uncertain scenario, the proper management of short-term resources and obligations has gained paramount importance in ensuring profitability of corporations. Hence, the topic of working capital management that deals with maintaining a proper balance between liquidity and efficiency has become an important strategic issue for those organizations operating in volatile economic environment. This is particularly true for the manufacturing industry because a large portion of overall firm assets is represented by inventory, accounts receivable, and short-term borrowing. As far as India is concerned, the manufacturing industry plays an important role in driving economic growth and employment creation in the country, as can be seen from Table 1. As per official data released by the government in its Annual Survey of Industries (ASI), the manufacturing industry is responsible for about 17% of the national GDP and has posted impressive growth in gross value added

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(GVA) at 11.9% in the fiscal year 2023-24. In the same period, manufacturing employment has risen by almost 6% with the overall workforce.

Table 1: Survey on Manufacturing Sector

Indicator	Value (FY 2023–24)
Contribution to GDP (approx.)	~17 % of India's GDP
Gross Value Added (GVA) Growth	11.9 % increase in manufacturing GVA
Employment Growth	Manufacturing employment up ~5.9 %
Total Manufacturing Workforce	~19.5 million people employed in manufacturing
Employment Trend	Employment rose ~7.5 % in 2022–23 vs 2021–22

Source: Compiled from data presented by MoSPI and ASI (Annual Survey of Industries)

Even though the relationship between the management of working capital and profitably has been studied extensively in the literature, several areas of interest are yet to be explored. The studies conducted before the pandemic do not give an idea of how firms function during the pandemic period, when changes were experienced in terms of liquidity and supply chain. Separate examination of the three elements, that is, accounts receivable, inventory, and accounts payable has also been conducted, while they are managed in conjunction. In addition, the profitability aspect is usually based on one single index; thus, the operational aspect of the firm performance as well as the capital and asset-based and shareholders aspect cannot be captured. Another aspect that needs to be addressed is that there is little evidence after the pandemic in the Indian context, more specifically for Indian manufacturers.

The manufacturing industry contributes significantly towards the economy of India through its contribution towards the growth of the GDP of the country which stands at around 16-17%. The working capital management is highly crucial in relation to the profitability of firms in the manufacturing and construction industries since a large part of the total assets of the business constitutes current assets. Managing the current assets in their optimal level becomes very crucial for the manufacturers. Too low a level of the current assets would result in shortages while too high a level would result in bad returns (Horne & Lachowicz, 2000).

Consequently, their relationship between working capital management and profitability needs to be considered. This paper will analyze the link between working capital components and profitability variables.

Literature Review

Working capital management and firm profitability have been widely studied in the field of finance literature, specifically in industries like manufacturing where business operations have been demanding and require proper liquidity management. Previous theories have focused on the basic conflict between liquidity and profitability, wherein firms must manage short-term liquidity while maximizing long-term profitability (Smith, 1973; Schwartz, 1974). Further research done by Emery (1984) stressed the importance of trade credit financing especially in situations of information asymmetry and lack of access to formal sources of funds.

Research has indicated the presence of a correlation between the management of working capital and profitability, albeit the direction of this relationship is yet to be determined. For instance, a study by Deloof (2003) has shown that companies with short cash conversion cycles (CCC) and receivable collection period tend to enjoy greater profitability levels, indicating the positive impact of effective liquidity management on company performance. Moreover, Shin and Soenen (1998) found the existence of a negative correlation between cash conversion cycle and corporate profitability, which indicates that companies can achieve profitability through the reduction of the time it takes for their working capital cycles to occur. Further researches question the idea that all working capital reductions will result in improved performance.

According to Baños-Caballero et al. (2012), there is such thing as the optimal level of working capital, which means that its excess or deficit may reduce the profitability of companies. This perspective implies that companies need to pursue the optimal balance, not just lower the amount of working capital elements. In support of this position, Knauer and Wöhrmann (2013) claim that the efficiency of working capital strategies is associated with firm-related factors, including its complexity, industry conditions, and financial.

The importance of working capital takes greater prominence for manufacturing companies, especially considering the relatively long production processes involved and the increased need for

inventories. Aldubhani et al. (2022) present some recent findings from Qatar, according to which smaller receivables collection periods and cash conversion cycles lead to higher profits, and longer payments periods can have a positive effect as well because of the advantages of trade credit. These findings emphasize the tradeoffs that are involved in working capital management, as companies have to reconcile liquidity limitations with profitability goals.

Accounts Receivable Management

The accounts receivable management is well known as an important aspect impacting the firm's success. The effective management of receivables is beneficial because it provides increased liquidity, minimizes external financing needs, and allows making predictions of cash flows. The empirical evidence mostly supports the negative relation between collection period of receivables and profitability of a firm. For example, according to Bieniasz and Gołas (2011) and Enqvist et al. (2014), firms with lower collection periods exhibit higher levels of profitability that indicate high operational efficiency. In addition, Purwanti (2019) found out that there is a positive relation between the turnover of receivables and profitability that proves that the better credit management results in better performance. In addition, Gill et al. (2010) and Phuong and Hung (2020) proved that faster collection of receivables positively impacts the firm profitability due to minimized cost of financing and improved liquidity. Nevertheless, the existing literature raises concerns about the endogeneity. Firms with higher profitability can use trade credits to a greater extent and thus improve the turnover of receivables.

Accounts Payable Management

Accounts payable is one of the major sources of financing in the short term through trade credit. According to various theoretical frameworks (Deloof & Jegers, 1996; Emery, 1984), trade credit may be used to lower the transaction cost and gain greater flexibility in terms of liquidity management. Empirical evidence seems to be ambiguous. Some researchers state that there is a positive connection between slow payment and profitability. For instance, Jayarathne (2015) and Goncalves et al. (2018) found out that the use of payment periods helps to achieve additional benefits since companies can invest suppliers' money into short-term projects. Also, Mueller and Novak (2014) stated that, in most cases, trade credit comes with better conditions than the bank loan. At the same time, Oranefo and Egbunike (2023) did not find any correlation between accounts payable and accounting-based profitability metrics.

Inventory Management

In manufacturing organizations, inventory management is essential since the production process involves high stock levels. Nevertheless, the link between inventory turnover and profitability is not clear cut.

According to Gaur et al. (2005), there exists a trade-off between inventory turnover and profit margins where high profit margins lead to low inventory turnovers, mainly due to pricing practices. On the other hand, Farooq (2019) notes that there is no direct significant link between inventory turnover and profitability, although good inventory management can help improve performance through cost reduction. Current research findings give divergent results. For instance, Alnaim and Kouaib (2023) find a significant relationship between inventory turnover and profitability in Saudi manufacturing organizations.

Cash Conversion Cycle and Liquidity

The cash conversion cycle (CCC) is commonly used as a composite indicator of working capital management. The CCC indicates the amount of time needed for converting the investments in inventory and receivables to cash flows. There is a negative correlation between CCC and profitability in the early researches conducted by Shin and Soenen (1998), and Deloof (2003). On the other hand, there is some contradictory evidence regarding the relationship between CCC and profitability in other research works. Lyroudi and Lazaridis (2000) and Sharma & Kumar (2011) show positive correlations between the CCC and profitability of the firms, indicating that longer cycles can result in better profits for firms through increased sales and credit policies. From the point of view of liquidity, Schilling (1996) states that the longer the cash conversion cycles are, the more liquidity needs a firm will have.

Broader Determinants and Cross-Country Evidence

Apart from individual working capital components, there have been studies analyzing the influence of working capital management in a more holistic approach. Makori & Jagongo (2013) reveal a significant relationship between working capital management and firm profitability for Kenyan companies, with Jakpar et al. (2017) providing similar results in the Malaysian manufacturing industry. Alarussi &

Alhaderi (2018) emphasize the importance of firm-specific variables such as size and leverage in affecting profitability.

Studies from multiple countries show that the relationship between working capital management and firm performance is dependent on certain institutional and economic factors. Ahmad et al. (2022) prove that the influence of working capital components on firm performance differs depending on the economic crisis, with varying results recorded during the COVID-19 pandemic and 2008 financial crises.

Recent Developments and Post-Pandemic Context

There has been an increasing focus on contextual variables, especially during times of economic disruptions in the recent literature. According to Pant et al. (2024), greater amounts of working capital have a positive impact on organizational performance following the disruptions caused by COVID-19, contrary to the conventional approach focusing on reduction of working capital. The results imply that organizations need to have sufficient liquidity in times of uncertainty. Similarly, the authors Moedt et al. (2024) talk about the "growing pains" that organizations face during their growth phase, implying that organizations are not efficient in this phase, leading to lower profitability.

Research Gap

Despite the abundant amount of literature, several gaps still exist. Firstly, most of the existing literature is based on the aggregated approach to working capital management with little attention paid to the effect of its elements considered together. Secondly, the conclusions drawn by different researchers are largely dependent on the context – industry, geographical location, and economic situation. Thirdly, relatively little information can be found concerning Indian manufacturing companies, especially those operating after the pandemic period.

In order to address the identified gaps, the current research utilizes the comprehensive approach to working capital management at the level of its separate components in order to explore their effect on the profitability of Indian manufacturing companies.

Objectives of the Study

- To examine the impact of working capital management on the profitability of Indian manufacturing firms in the post-pandemic period.
- To analyze the individual effects of accounts receivable turnover, accounts payable turnover, inventory turnover, and the cash conversion cycle on firm profitability.
- To assess whether efficient management of working capital components contributes to improved firm performance amid post-COVID-19 supply chain and liquidity disruptions.
- To provide contemporary empirical evidence on the working capital–profitability relationship for Indian manufacturing firms using a comprehensive component-based framework.

Hypotheses of the Study

H1: Working capital management has a significant impact on the profitability of Indian manufacturing firms in the post-pandemic period.

H1a: Accounts receivable turnover has a significant relationship with the profitability of Indian manufacturing firms.

H1b: Accounts payable turnover has a significant relationship with the profitability of Indian manufacturing firms.

H1c: Inventory turnover has a significant relationship with the profitability of Indian manufacturing firms.

H1d: The cash conversion cycle has a significant relationship with the profitability of Indian manufacturing firms.

Data Selection

Based on the research objectives and the existing post-pandemic studies on working capital management, the current study will be centered on the Indian manufacturing organizations listed at the National Stock Exchange (NSE). A sample of 135 manufacturing organizations that had consistent financial data will be selected for the study. The data for this research will be collected using the annual reports of these organizations from 2022 to 2024. The period under consideration is the post-COVID-19 period in which companies have been experiencing challenges related to liquidity and logistics. Firm

profitability is measured using several criteria in order to capture its different aspects. Return on assets (ROA) is a measure used to gauge the efficiency of the firms in converting assets into profit and is calculated by dividing net income by total assets. Return on equity (ROE) is the measure of return generated for the shareholders and is calculated by dividing net income by shareholders' equity. Return on capital employed (ROCE) is a measure that considers the profitability of a company relative to its total investment of capital, which is the sum of equity and debt, and is determined by calculating earnings before interest and tax relative to capital employed. Operating profit margin (OPM) shows the operating efficiency of a company and the percentage of sales revenue converted into operating profit, which is determined by dividing operating profit by net sales. Using different profitability ratios provides a broader perspective on the analysis of the firm's performance.

Descriptive Statistics and Multicollinearity Diagnostics

Summary of Descriptive Statistics for Profitability and Working Capital Variables Used in Analysis

Table 2 contains the summary statistics for the variables of profitability and working capital used in the analysis. Generally, the sample manufacturing firms have relatively healthy averages in terms of profitability levels, although some dispersion exists between firms.

The average return on assets (ROA) ratio is 15.36 percent, where figures range from -8.16 percent to 37.05 percent, implying that most firms had positive profitability levels, although some firms had been under financial distress during the research period. The average ROE ratio is 20.99 percent but with high dispersion due to the differences in capital structure and profits. Similar situation was experienced by return on capital employed (ROCE), where the average ratio was 17.63 percent. Average operating profit margin (OPM) ratio was 17.66 percent.

Table 2: *Descriptive Statistics*

Variable	Observations	Minimum	Maximum	Mean	Standard Deviation
ROA	135	-8.16	37.05	15.36	8.67
ROE	135	-26.12	136.24	20.99	20.31
ROCE	135	-24.25	123.12	17.63	17.63
OPM	135	2.73	37.05	17.66	7.84
ART	135	2.10	99.27	24.12	20.53
INVT	135	2.76	177.87	29.49	29.48
APT	135	2.05	41.03	6.28	5.61
CCC	135	-1.42	4.52	-0.04	1.02

Source: Calculations based on the data collected

As far as the working capital management is concerned, the companies have been able to recover their receivables within 24 days on an average basis, which is indicative of quite effective credit management processes. The companies have managed to convert their inventories into cash within 29 days; however, it is interesting to note that there is considerable variability in this case, implying that inventory management efficiencies vary widely between companies. The companies have paid off their accounts payable very promptly, taking just about 6 days on an average basis. Consequently, the cash conversion cycle is quite close to zero or even negative, which means that the firms receive payment from their customers prior to the payments becoming due to their suppliers.

Table 3: *Variance Inflation Factor Results*

Variable	VIF
ART	3.894423
INVT	4.282189
APT	1.630245
Sales growth	1.089974
LN of Assets	1.212339
CCC	6.064691
DE	1.640755

Source: Calculation based on data collected

Before carrying out regression analysis, the study also considered the possibility of multicollinearity, as the presence of strong correlations among the independent variables tends to increase standard errors and make coefficient estimation difficult. This was done by using both the Variance Inflation Factor (VIF) and Pearson correlation coefficients. According to the VIF values presented in Table 3, all VIF values for the accounts receivable turnover (ART), inventory turnover (INVT), accounts payable turnover (APT), sales growth, natural log of total assets (LN of Assets), and the cash conversion cycle (CCC) lie within 3.89, while the VIF value for the debt-equity ratio (DE) is 1.64. All VIF values fall between 1.08 and 6.06, all of which fall below the threshold of 10; this means that there is no problem with multicollinearity. Moreover, Pearson correlation coefficients (Table 4) show that the correlation between any pair of the explanatory variables is moderate and does not exceed critical values.

Methodology

Multiple regression analysis will be applied to investigate the relationship between working capital management and profitability. The multiple regression method will make it possible for the study to consider how the different parts of the working capital ratio influence the performance of the business firm, taking into account the size of the company, the growth rate, and leverage among others. Multiple regression is very appropriate for the investigation because it helps to determine the individual contribution of every element of the working capital management in profitability. Besides, it allows investigating the direct and indirect relationships of the variables and the differences in the firms under investigation.

Since this method allows us to investigate various aspects of profitability simultaneously, this methodology will provide an in-depth analysis of relationships between efficiency, capital use and financial management with working capital policies. In the situation when companies are currently facing liquidity problems, disruptions in supply chains and other changes in the business environment after the pandemic, multiple regression allows us to examine whether working capital management still impacts profitability in the changed business environment. Profitability will be analyzed with four indices: operating profit margin (OPM), return on assets (ROA), return on capital employed (ROCE) and return on equity (ROE). These indices show the performance, economic efficiency, capital use and return on equity respectively. In order to check the hypotheses of the study, we will estimate the following regression equations for each of these profitability indices:

Model 1: Operating Profit Margin (OPM)

$$OPM_it = \beta_0 + \beta_1 \cdot ART_it + \beta_2 \cdot INVT_it + \beta_3 \cdot APT_it + \beta_4 \cdot CCC_it + \beta_5 \cdot LN(Assets)_it + \beta_6 \cdot SG_it + \beta_7 \cdot DE_it + \varepsilon_it$$

Model 2: Return on Assets (ROA)

$$ROA_it = \beta_0 + \beta_1 \cdot ART_it + \beta_2 \cdot INVT_it + \beta_3 \cdot APT_it + \beta_4 \cdot CCC_it + \beta_5 \cdot LN(Assets) + \beta_6 \cdot SG_it + \beta_7 \cdot DE_it + \varepsilon_it$$

Model 3: Return on Capital Employed (ROCE)

$$ROCE_it = \beta_0 + \beta_1 \cdot ART_it + \beta_2 \cdot INVT_it + \beta_3 \cdot APT_it + \beta_4 \cdot CCC_it + \beta_5 \cdot LN(Assets)_it + \beta_6 \cdot SG_it + \beta_7 \cdot DE_it + \varepsilon_it$$

Model 4: Return on Equity (ROE)

$$ROE_it = \beta_0 + \beta_1 \cdot ART_it + \beta_2 \cdot INVT_it + \beta_3 \cdot APT_it + \beta_4 \cdot CCC_it + \beta_5 \cdot LN(Assets)_it + \beta_6 \cdot SG_it + \beta_7 \cdot DE_it + \varepsilon_it$$

These regressions contain ART, APT, INVT, and CCC as the elements of the working capital, while the variables such as LN(Assets), SG, and DE are included as the control variables to control for the firm size, growth, and leverage. The error term accounts for the impact of unobservable factors on the profitability of the firms. The hypotheses were tested with the help of linear regression analysis. These results are shown in Table 5 below. This approach enables the evaluation of each element of the working capital as well as the collective impact of all elements on different aspects of firm profitability.

Results and Discussions

From the Pearson correlation coefficients shown in Table 4, it can be observed that accounts receivable turnover (ART) has a positive correlation with return on equity (ROE) and return on capital employed (ROCE). This indicates that firms with a faster collection of receivables have higher levels of profitability. Inventory turnover (INVT) has weak correlations with profitability indicators, implying that

better inventory management does not necessarily imply higher profit levels, even though there could be an indirect effect. Accounts payable turnover (APT) has a positive correlation with ART and negative correlation with profitability indicators, indicating the inverse relationship between liquidity management and profitability. Cash conversion cycle (CCC) has strong positive correlations with ART and INVT, indicating the relationship between management of receivables and inventories in influencing the liquidity cycle of the firm. Firm size and sales growth have negative correlations with profitability indicators, implying that the growth of the firm could come at a cost of "growing pains".The findings from the multiple regressions on the relationship between Working Capital Management factors and company profitability using Operating Profit Margin (OPM), Return on Assets (ROA), Return on Equity (ROE), and Return on Capital Employed (ROCE) as the measure of profitability are shown in Table 5. The models are statistically significant ($p < 0.01$) as shown by the F-values. The variation in the ability to explain the variation in profitability measures is rather large; adjusted R^2 varies from 0.146 (OPM) to 0.533 (ROE). It seems that the chosen factors are good in explaining performance measures oriented towards the shareholders but not so good in operating and asset based measures.

Operating Profit Margin (OPM)

OPM's regression analysis reveals that the single significant factor is accounts payable turnover (APT) ($\beta = -0.750$, $p < 0.05$). Since the coefficient is negative, one can conclude that companies, which have less payable turnover due to the delays in paying suppliers, tend to demonstrate better operating margins. This finding proves the assumption that trade credit may become an affordable and flexible way of short-term financing that would enable firms to retain their liquidity and decrease the need to borrow money from outside. It should be carefully interpreted. The existence of such a connection might be explained by supplier selection effect, according to which financially healthy or fast-growing companies get more relaxed credit terms. In this way, the direction of the causality might be bidirectional, what raises the suspicion about the possible endogeneity. Accounts receivable turnover (ART), inventory turnover (INVT), and cash conversion cycle (CCC) are also insignificant factors.`

Table 4: Pearsons' Correlation Coefficient Results

	ART	INVT	APT	Sales growth	LN of Assets	CCC	ROA	ROE	ROCE	OPM	DE
ART	1										
INVT	-0.0288	1									
APT	0.4862	-0.0053	1								
Sales growth	0.1305	0.0998	0.1502	1							
LN of Assets	0.2042	0.1112	0.0942	0.0797	1						
CCC	0.5172	0.8299	0.1076	0.1632	0.1744	1					
ROA	-0.0829	-0.1271	-0.1420	-0.3950	-0.2052	-0.1515	1				
ROE	0.5652	-0.0543	0.1039	-0.1256	-0.2898	0.2977	0.3284	1			
ROCE	0.4665	-0.0463	-0.0014	-0.1389	-0.3266	0.2670	0.3509	0.9682	1		
OPM	-0.2436	-0.1818	-0.2524	-0.2403	-0.2342	-0.2844	0.7827	0.1540	0.1944	1	
DE	0.4313	-0.0055	0.4369	0.1918	0.38409	0.1383	-0.1494	0.0415	-0.1608	-0.2168	1

Table 5: Multiple Regression Results

Variables	Model 1: OPM	Model 2: ROA	Model 3: ROE	Model 4: ROCE
Intercept	-2.659 (0.024)	-2.585 (0.027)	-5.761 (<0.001)	-5.248 (<0.001)
Accounts Receivable Turnover (ART)	0.076 (0.629)	0.188 (0.231)	0.740 (<0.001)	0.768 (<0.001)
Inventory Turnover (INVT)	0.048 (0.675)	0.070 (0.542)	-0.010 (0.911)	0.022 (0.804)
Accounts Payable Turnover (APT)	-0.750 (0.046)	-0.494 (0.183)	-0.710 (0.011)	-0.802 (0.005)
Sales Growth	-0.164 (0.073)	-0.380 (<0.001)	-0.183 (0.007)	-0.147 (0.035)
Log of Assets	-2.922 (0.074)	-3.083 (0.057)	-7.665 (<0.001)	-6.768 (<0.001)
Cash Conversion Cycle (CCC)	-0.296 (0.129)	-0.230 (0.233)	0.058 (0.687)	-0.005 (0.974)
Debt to Equity (DE)	-0.040 (0.693)	-0.017 (0.869)	-0.007 (0.928)	-0.229 (0.004)
R Square (R^2)	0.190	0.207	0.557	0.531
Adjusted R^2	0.146	0.163	0.533	0.505
F-Statistic	4.260	4.730	22.832	20.555
Significance (F)	0.00029	0.000095	<0.001	<0.001

Firm size (log of assets) exhibits a marginally negative effect ($p \approx 0.074$), indicating possible diseconomies of scale, although the evidence remains weak.

Return on Assets (ROA)

From the ROA regression model, we see that the variable of sales growth ($\beta = -0.380$, $p < 0.001$) is strongly significant as a negative determiner, while firm size is negatively related, but marginally significant ($p \approx 0.057$). From this, one can conclude that growth can have a negative effect on asset efficiency. The negative relationship between sales growth and ROA results from inefficiency due to growth, which includes low asset utilization, higher operating expenses, and adjustment difficulties during the growth phase. This follows from previous empirical literature regarding the growth-efficiency trade-off, where companies pursuing growth may sacrifice efficiency temporarily. The negative value of the firm size variable suggests the existence of diminishing returns on asset, due to the fact that it is becoming more difficult to coordinate the bigger firm. There are no statistically significant working capital variables in this model.

Return on Equity (ROE)

- The ROE model shows considerable explanatory power (Adjusted $R^2 = 0.533$). This implies that the selected variables have a good capacity to explain variations in the shareholders' returns. With regards to the working capital variables:
- Accounts Receivable Turnover (ART) shows a very strong and statistically significant positive effect on ROE ($\beta = 0.740$, $p < 0.001$). This result implies that proper management of receivables is a way of boosting profitability through improved liquidity and reduced constraints for financing.
- Accounts Payable Turnover (APT) is negative and statistically significant ($\beta = -0.710$, $p < 0.05$). This supports the previous conclusion about how delayed payments can improve profitability. Nevertheless, sales growth ($\beta = -0.183$, $p < 0.01$) and size ($\beta = -7.665$, $p < 0.001$) of a firm have negative significant effects on ROE. This means that growth of the business is not likely to lead to better returns of equity holders probably because of the need for reinvestments or complexities associated with running a larger organization. Importantly, the positive relationship between ART and ROE could be explained by the reverse causality, where the more profitable a business is, the more it is capable of offering trade credit to its clients and thus increase receivables turnover.

Return on Capital Employed (ROCE)

ROCE analysis is also very similar to the ROE model results and has an excellent predictive power (Adjusted $R^2 = 0.505$). Important determinants are:

- Accounts Receivable Turnover (ART): Positive and very significant ($\beta = 0.768$, $p < 0.001$)
- Accounts Payable Turnover (APT): Negative and significant ($\beta = -0.802$, $p < 0.01$)
- Sales growth: Negative and significant ($p < 0.05$)
- Size: Very negative ($p < 0.001$)
- Debt/Equity Ratio (DE): Negative and significant ($\beta = -0.229$, $p < 0.01$)

The negative correlation between debt and ROCE means that debt leads to lower returns on capital employed because of higher interest payments. But this correlation can also be interpreted as driven by financing decisions of profitable firms (pecking order theory), which use less debt. In this case there is a problem of simultaneity bias.

Implications

- Insights that can be drawn from the above-discussed results include:
- Selective relevance of working capital elements - There is selective relevance of the effect of working capital elements on firm profitability. The management of receivables and payables affects the equity-based measures of profitability (ROE and ROCE) but not the operating and asset-based measures (OPM and ROA).
- Negative impact of firm growth and size – The negative association of sales growth and firm size with profitability is a recurring theme in all the models tested, and suggests that diseconomies of scale exist.
- Insignificance of inventory and cash conversion cycle - Inventory turnover and CCC are insignificant in all the models, thereby casting doubt on the assumed relevance of these variables in explaining profitability.

- Endogeneity problem - The associations between receivables and payables turnovers and profitability might have reverse causality problem since profitability might be causing the working capital management activities.

Conclusion

The present study has analyzed the impact of the management of working capital on the profitability of 135 manufacturing companies listed in the National Stock Exchange (NSE) during the time period from 2022 to 2024. It is worth mentioning that the choice of the manufacturing industry is crucial as the latter is one of the key factors driving economic growth in India, and the need to manage short-term resources is vital in the context of the chosen sector. According to the results, there is a complex correlation between working capital management and profitability in terms of various indicators used to assess firm performance. Although elements of working capital management, namely, the management of receivables and payables have a considerable impact on shareholder-based indicators such as Return on Equity (ROE) and Return on Capital Employed (ROCE), their effect on the Operating Profit Margin (OPM) and Return on Assets (ROA) is much lower. Thus, it could be said that working capital management strategies are more related to creating value for shareholders rather than to achieving some specific operational results. The results consistently indicate a negative effect of sales growth and firm size on profitability. Thus, there is no positive correlation between growth. The discussion also underscores the significance of managing receivables and payables. Those firms that are efficient at collecting receivables usually have good financial performance, probably because of increased liquidity and lower financing needs. In this case, those firms that pay to suppliers later also demonstrate profitability, which implies that trade credit is a good tool of using as a financing tool. Relationships like these may be due to the difference in strength of firms, which means that we cannot treat these relations as causal. Inventory turnover and cash conversion cycle are not influential in this situation in terms of profitability. This fact suggests that their influence might depend on firm and/or industry specific factors, rather than always play an important role. The research adds weight to the assumption that working capital management is a factor that influences the performance of firms and is complex. It does not mean that one should minimize or maximize all components of working capital. Practitioners should think about the balance and the context in which certain decision is taken. Besides, they should focus on the strategies of managing liquidity as well as growth and financing.

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