

Working Capital Efficiency and the Profitability Nexus: A Longitudinal Comparative Analysis of India's Leading Automobile Firms

Tapas Kumar Sahoo

Assistant Professor, Faculty of Management and Commerce
M. S. Ramaiah University of Applied Sciences
Bengaluru, PIN: 560054
Email: tapassahoo7537@gmail.com
ORCID: 0000-0002-3820-1786

Ghanashyam Kafley

Assistant Professor, Department of Commerce
SRM University Sikkim
Sikkim, PIN: 737102
Email: shyamghana75@gmail.com
ORCID: 0000-0001-7474-1395

Vivek Darjee

M.Com. Student, Department of Commerce
SRM University Sikkim
Sikkim, PIN: 737102
Email: vivekk_darjee@srmus.edu.in

Abstract: This paper investigated the relationship between working capital efficiency and profitability of automobile manufacturing companies operating in India using a comparative time-series analysis of leading automotive manufacturers between 2010-2025. This research evaluated major elements of working capital, i.e., inventory turnover, accounts receivable & payable management, and the cash conversion cycle. Descriptive statistics, t-tests for independent samples, correlation coefficients, and regression models were used to evaluate working capital efficiency as well as its effect on Profitability measured by ROA. Results indicated that improved working capital efficiencies lead to increased firm profitability. Also, the positive effects of shortening the cash conversion cycle and optimal management of inventory and accounts receivable have been found to be related to improvements in firm profitability. In addition to this, the results indicate that firms consistently managing their working capital are more stable and also achieve higher levels of profitability than those firms who do not manage their working capital. These findings emphasize the importance of optimizing working capital in highly capital intensive sectors.

Keywords: Working Capital, Profitability, Cash Conversion Cycle, Return on Assets, Automobile Industry

JEL Classification: G31, G32, L62, M41

Introduction

Working Capital Management (WCM) is one of the most critical areas within Financial Management for companies. Companies need to have enough liquid funds available to cover their short-term obligations while maximizing profits and shareholders' wealth ([Makori & Jagongo, 2013](#); [Deloof, 2003](#); [Ukaegbu, 2014](#)). WCM is defined as the amount of money needed to run day-to-day operations. It includes procuring raw materials, producing products, and paying suppliers and employees ([Nguyen et al., 2020](#); [Sitlani, 2012](#); [Alvarez et al., 2021](#)). WCM is sometimes called "the life blood" of an organization because if a company does not have enough working capital, it will be unable to operate efficiently and could experience serious financial problems ([Makori & Jagongo, 2013](#); [Sharma & Kumar, 2011](#)). On the other hand, investing too much in working capital would mean underutilizing resources and low returns. Therefore, companies are constantly searching for an ideal equilibrium point among liquidity and profitability. This equilibrium point is known as the Liquidity- Profitability Trade Off ([Smith, 1980](#); [Nazir & Afza, 2009](#)). Effective WCM reduces the cost of financing and increases operating efficiency. [Garg & Meentu \(2022\)](#) stated that WCM was effective when a company's cash conversion cycle (CCC) is minimized. In general terms, CCC measures the length of time between the date the company pays its suppliers for raw materials and the date the company receives payment from its customers. The shorter CCC means that the company can recover its investments faster. Generally speaking, research shows a strong negative correlation between CCC and profitability indicating that companies can enhance their profit margins by decreasing their days payable outstanding and accounts receivable. ([Deloof, 2003](#), [Ukaegbu, 2014](#); [Singh et al., 2017](#); [Yousaf et al., 2021](#)).

Additionally, studies show that longer days payable outstanding and days sales outstanding negatively affect profitability while effective working capital management leads to better

financial results. ([Nurhidayat & Thamrin, 2023](#); [Singh et al., 2017](#); [Demiraj et al., 2022](#); [Chowdhury et al., 2018](#); [Asfawu, 2019](#)). Nevertheless, the relationship between working capital management and profitability varies widely among authors. Many studies report a negative relationship between working capital management and profitability ([Charitou et al., 2016](#); [Phuong & Hung, 2020](#)). Some studies, however, report positive or non-linear associations based on firm attributes, industry-specific factors or macroeconomic conditions. For example, offering extended credit to customers may generate increased revenue due to more sales opportunities but also generates higher risks of late payments and increased borrowing costs. ([Sharma & Kumar, 2011](#); [Rahman, 2023](#)). Similarly, keeping high inventory levels may allow continued sales during fluctuations in demand but also increase storage costs ([Anjum, 2017](#); [Karim et al., 2017](#); [Asfawu, 2019](#)).

The above mentioned conflicting results indicate that working capital-profitability connection is dependent upon many variables and should therefore be viewed in the context of various circumstances. It is especially true in emerging markets such as those in South Asia, where most businesses lack easy access to outside funding sources and depend almost entirely on internal funding. Thus, successful working capital management enables businesses to be financially stable and able to react rapidly to changes in their respective national economies. ([Goncalves et al., 2018](#); [Meah et al., 2021](#)). Furthermore, companies apply three types of working capital policies aggressive, conservative and intermediate with varying implications for risk and return. Aggressive policies may increase profitability but simultaneously increase liquidity risk. Conservative policies assure stability at the expense of returns. ([Nazir & Afza, 2009](#); [Mansoori & Muhammad, 2012](#)).

The automotive industry offers a good opportunity to examine working capital practices since they are characterized by long production processes and involve large amounts of raw

materials inventory. Hence, working capital management is very important in order to keep inventory turnover rates high and minimize delays in receiving payment from clients ([Ahmed & Khan, 2015](#); [Garg & Singh, 2023](#)). The Indian automobile industry is a significant contributor to India's economy both through generation of income and employment. At the same time, this sector has faced some serious challenges including fluctuation in demand and increase in raw material prices. ([Rahman, 2022](#); [Demiraj et al., 2022](#)). Although the number of research studies conducted on working capital management has grown exponentially over the last two decades, few studies were carried out at the level of firms or longitudinally within the Indian automobile sector. Most previous studies were limited to analysing industries rather than individual firms that use working capital and the effects thereof on profitability ([Mayank, 2014](#); [Sharma & Kumar, 2011](#)). Also, not enough studies have investigated the combined effect of the main components of working capital namely inventory, receivables and payables. In light of these considerations, this paper explores the relationship between working capital efficiency and firm profitability through a longitudinal comparative analysis of major Indian automobile companies during the period 2010 – 2025. Through investigating working capital management at the firm level and taking into consideration multiple aspects of working capital management, this study aims to contribute substantially towards our understanding of the working capital-profitability relationship and provide actionable recommendations for increasing financial performance in a highly competitive emerging market environment.

Literature Review

In addition to being a major factor affecting the performance of businesses, especially those with high capital requirements, the process of managing current resources and obligations is widely viewed as a business practice capable of having a significant direct effect on profit margins, liquidity and long-term financial health of an organization ([Makori & Jagongo, 2013](#); [Deloof,](#)

[2003](#); [Alvarez et al., 2021](#)). The goal of WCM involves finding the most appropriate level of balance between liquidity and profit in order to avoid investing too much in working capital which would result in decreased profits or under-investing in working capital which could result in ineffective operations ([Sharma & Kumar, 2011](#); [Nazir & Afza, 2009](#)).

A large number of empirical studies have investigated the connection between WCM and profitability. In earlier studies it was shown that the CCC is a primary measure for assessing working-capital efficiency and there is an inverse relation between the length of the CCC and profit margin. These results suggest that organizations can contribute positively to profit margin when they shorten the period required to transform investments in accounts payable, accounts receivable and inventory into cash. Supporting these views, [Ukaegbu \(2014\)](#) identified a very strong inverse correlation among profitability and CCC over developing countries' economies; therefore, organizations whose operating-cycles were short improved profitability. Likewise, [Nguyen et al. \(2020\)](#) demonstrated that shortening account payable and inventory days will produce significant improvements in profitability supporting the importance of good working-capital management. These findings are further supported by studies such as [Deloof \(2003\)](#), [Yousaf et al. \(2021\)](#), [Sitlani, \(2012\)](#) and [Karim et al. \(2017\)](#), which emphasize the critical role of reducing cash conversion cycles in enhancing firm performance.

In addition to identifying how poor WCM practices affect profitability among firms in developing/emerging markets numerous researchers identify that poor WCM practices relating to the components of working capital have a detrimental effect on firm profitability. Both [Nurhidayat and Thamrin \(2023\)](#) and [Singh et al., \(2017\)](#) documented that longer accounts payable and receivable days negatively affected returns on equity while effective turn-over of these working-capital components resulted in better financial performance. Further, research

conducted by [Demiraj et al. \(2022\)](#), and [Rahman \(2022\)](#) confirmed that optimization of the working-capital components, specifically the CCC, greatly increases the potential for profitability improvement within the automotive industry. However, the results do not agree completely. While some studies find positive or non-linear relations between WCM and profitability implying that effects can be dependent upon firm-characteristics and market-conditions other studies show a clear inverse relationship. An example of the latter includes [Sharma and Kumar \(2011\)](#) who illustrated through their study that certain elements of WCM correlate positively with profitability among Indian companies, thus extending credit terms may lead to greater sales and revenues. Furthermore, [Singhanian and Mehta \(2017\)](#) and [Sitlani, M. \(2012\)](#), concluded that both aggressive and conservative working-capital management strategies can have different impacts upon firm-value, illustrating the complexity involved in the relationship between WCM and profitability. Finally, the meta-study by [Singh et al. \(2017\)](#) indicated while a general inverse relationship existed between WCM and profitability, that the magnitude and direction of this relationship varied among industries and economic-environments.

The development and implementation of working-capital policies has received considerable attention throughout the literature. As examples of this, both [Nazir and Afza \(2009\)](#), and [Usman et al. \(2017\)](#) illustrated that inefficient working-capital management creates an inverse relationship between profitability. However, the former authors also showed that if an organization employs aggressive working-capital policies characterized by low levels of current assets that organization is likely to experience higher profitability at a higher risk. The latter authors stated that inefficient use of three components of working capital (i.e., inventory, accounts receivable/payable) result in lower profitability; therefore, organizations should implement optimal policies. Additionally, [Goncalves et al. \(2018\)](#) illustrated that economic cycles play a significant role in determining whether or not working-capital-

management strategies are effective; thus firms must develop strategies based upon macro-economic factors.

While a vast amount of research has been completed related to WCM, many gaps exist in the literature, including the areas of firm-level analysis and longitudinal analysis within specific industries. Most prior studies have used cross-sectional data or industry-wide data with little comparison made between leading firms. Also, while many studies have compared different components of working capital (e.g., inventory, accounts receivable/accounts payable); however, few studies have compared all three of these components in an emerging market context (the Indian automobile sector). Thus, this study contributes to the existing literature by completing a longitudinal comparative analysis of working-capital management and profitability in leading Indian automobile firms. Furthermore, this study provides additional insight into the working-capital-profitability nexus by examining multiple-dimensions of WCM using firm-specific dynamics within an emerging-market context.

Research Methodology

Research Design

The current research utilizes both an analytical and comparative approach to establish causality between Working Capital Efficiency and Firm Profitability. An analytical approach is utilized to assess the influence of each component of Working Capital Management on profitability. Additionally, a comparative approach was adopted to compare the various aspects of Working Capital Management strategies among two of the most successful automotive companies in India. The duration of the study is sixteen years (2010 – 2025), enabling researchers to observe trends temporally, structural changes, and the durability of the associations during distinct periods within the economic environment, e.g. when there are fluctuations in the economy and subsequent recovery.

Sample Selection and Study Period

The focus of the study is two of India's largest automobile companies, namely, Maruti Suzuki India Limited and Mahindra & Mahindra Limited. The rationale behind selecting these organizations was based upon several factors including market capitalization, industry leaders, operational scale and availability of data. Both of these organizations represent large proportions of the Indian automobile industry, where Maruti Suzuki specializes primarily in producing passenger automobiles and Mahindra & Mahindra produces utility vehicles and tractors. The timeframe of this study extends from 2010 through 2025 and provides sufficient time to evaluate potential variability in working capital practices, as well as how those practices contribute to or detract from profitability. As well, the extensive study timeframe will enable researchers to account for varying economic conditions, i.e. growing phases, contractionary phases, and outside influences affecting the economy.

Data Sources and Collection

All of the data required for this study was collected from secondary sources which are reliable and accessible. The data required for this study came from the Annual Reports of the chosen companies Maruti Suzuki India Limited and Mahindra & Mahindra Limited, which contain financial information regarding the Balance Sheets, Income Statements, and Cash Flow Statements of the organizations for the period of 2010 through 2025. In addition to obtaining financial data from Annual Reports, additional data were also acquired from official corporate websites, stock exchanges located in Mumbai (Bombay Stock Exchange) and National Stock Exchange, as well as financial databases, such as PROWESS. Using all of these data sources provided a high degree of assurance as to the validity and consistency of the financial information used in this study. All of the data were meticulously extracted, arranged, and combined into structured datasets utilizing spreadsheet software to make it easier to perform the necessary analyses. To increase accuracy and

reliability of the results obtained in this study, the authors cross-checked all of the data against multiple sources, and only utilized audited financial information.

Variables of the Study

The variables in this study were chosen to evaluate the relationship between working capital management and firm profitability at the level of individual firm operating component. The dependent variable for this study was Return on Assets (ROA), as well as the most common, and all-encompassing method to measure a company's overall performance based upon how efficiently it uses total assets to generate earnings ([Sharma & Kumar, 2011](#); [Nguyen et al., 2020](#)). In contrast to previous studies, which have utilized single or collective measures of working capital such as the Cash Conversion Cycle, this study broke down the concept of working capital into its various operational elements so as to gain additional insight. The independent variables in this study were Gross Working Capital Cycle (GWCC) and Net Working Capital Cycle (NWCC); both are used to determine whether the firm is utilizing their available working capital efficiently. In general terms, a short GWCC and/or NWCC will indicate efficient use of available working capital and an improvement in profitability ([Deloof, 2003](#); [Ukaegbu, 2014](#)).

Furthermore, this study also incorporated specific aspects of working capital including Raw Material Conversion Period (RMCP), Work-in-Progress Conversion Period (WIPPC), and Finished Goods Conversion Period (FGCP), which together illustrate the degree to which the firm manages inventory. Efficient inventory turnover is anticipated to result in improved firm performance, while extended holding periods may lead to increased costs and reduced profitability ([Singh et al., 2017](#); [Nurhidayat & Thamrin, 2023](#)). The length of time required to collect accounts receivable is measured by the Debtors Collection Period (DCP), where shorter collection times provide greater liquidity and lessens the amount of credit risk ([Nguyen et al., 2020](#)). The Creditors

Payment Period (CCP) represents the length of time required to make payments to creditors, which may positively or negatively influence firm profitability depending on firm strategy (Makori & Jagongo, 2013). Finally, this study also included two additional variables as a control variable that represent the size and liquidity

status of the firm, namely Gross Working Capital (GWC) and Net Working Capital (NWC). An increased amount of gross or net working capital may enable a firm to operate effectively, however, investing too much in either may create inefficient utilization of available resources leading to lower profitability.

Table 1: Variables of the Study

Sl. No.	Variable	Measurement	Citations	Expected Impact
1	ROA	Net Profit / Total Assets	Sharma & Kumar (2011); Nguyen et al. (2020)	—
2	GWCC	RMCP + WIPPC + FGCP + DCP	Deloof (2003); Ukaegbu (2014)	Negative
3	NWCC	GWCC – CCP	Deloof (2003); Ukaegbu (2014)	Negative
4	RMCP	Raw material holding days	Nurhidayat & Thamrin (2023)	Negative
5	WIPPC	Work-in-progress days	Singh et al. (2017)	Negative
6	FGCP	Finished goods holding days	Nurhidayat & Thamrin (2023)	Negative
7	DCP	Receivables days	Nguyen et al. (2020)	Negative
8	CCP	Payables days	Makori & Jagongo (2013)	Mixed
9	GWC	Total Current Assets	Singh et al. (2017)	Positive
10	NWC	CA – CL	Sharma & Kumar (2011)	Negative

Source: Author's own compilation using secondary data

Model Specification

To examine the impact of working capital management on firm profitability, the study employs a multiple linear regression model with control variables. The model is specified as follows:

$$ROA_t = \beta_0 + \beta_1 GWCC_t + \beta_2 NWCC_t + \beta_3 RMCP_t + \beta_4 WIPPC_t + \beta_5 FGCP_t + \beta_6 DCP_t + \beta_7 CCP_t + \beta_8 GWC_t + \beta_9 NWC_t + \delta_t$$

The study employs a multiple regression model to examine the impact of working capital management on firm profitability. In this model, Return on Assets (ROA) is used as the dependent variable, while Gross Working Capital Cycle (GWCC), Net Working Capital Cycle (NWCC), Raw Material Conversion Period (RMCP), Work-

in-Progress Conversion Period (WIPPC), Finished Goods Conversion Period (FGCP), Debtors Collection Period (DCP), and Creditors Payment Period (CCP) are included as independent variables representing different dimensions of working capital efficiency. Additionally, Gross Working Capital (GWC) and Net Working Capital (NWC) are incorporated as a control variable to capture the size and liquidity position of the firms. The model is estimated using the Ordinary Least Squares (OLS) method, with statistical significance tested at the 5% level.

To examine whether there is a significant difference in working capital management practices between the selected firms, an independent sample t-test is employed. The t-test is specified as:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

To further strengthen the statistical methodology and support the comparative objectives of this research, an independent-sample t-test is employed alongside the regression analysis. The independent-sample t-test is used to determine whether a statistically significant difference exists between the mean values of the working capital variables for the two firms under study. Specifically, the test compares the performance of the firms with respect to key working capital variables, including Gross Working Capital Cycle (GWCC), Net Working Capital Cycle (NWCC), Raw Material Conversion Period (RMCP), Work-in-Progress Conversion Period (WIPPC), Finished Goods Conversion Period (FGCP), Debtors Collection Period (DCP), Creditors Payment Period (CCP), Gross Working Capital (GWC), and Net Working Capital (NWC). The objective is to assess whether the observed differences in working capital practices between the firms are statistically significant or merely due to random variation. The decision is based on the p-values obtained from the t-test, where a p-value less than 0.05 indicates a statistically significant difference between the mean values of the two firms. The combined use of regression analysis and the t-test provides a comprehensive analytical framework, enabling both the evaluation of the impact of working capital components on profitability and the comparison of how these components are managed across firms.

Data Analysis and Interpretation

Descriptive Statistics

The result provided in Table 2 reveal that there are significant variations in how each company has implemented their working capital

management techniques. It can be seen from the data that Mahindra & Mahindra has recorded the highest mean Gross Working Capital (Rs. 72,377.11 crores) when compared to Maruti Suzuki (Rs. 58,684.24 crores); which indicates that Mahindra & Mahindra has made the largest investments in current assets and therefore also has the largest operational scale. Conversely, it can be observed from the data that Maruti Suzuki has demonstrated better management of its working capital than Mahindra. The Net Working Capital (NWC) figure for Maruti Suzuki shows an amount in negative (i.e., – Rs. 817.17 crores); whereas, the NWC figure for Mahindra is shown as positive (+ Rs. 2,419.20 crores); which clearly indicates that Maruti uses a much more liquid-based approach to managing its working capital. Also, when comparing the two companies' performance across all areas of the working capital cycle; it was found that Maruti Suzuki had performed better than Mahindra & Mahindra. All the figures for Raw Materials Conversion Period (RMCP), Work-in-Progress Conversion Period (WIPCP), Finished Goods Conversion Period (FGCP), and Debtors Collection Period (DCP) were lower for Maruti; which indicates that Maruti has managed to operate at a faster rate than Mahindra across these four different areas of the supply chain. Furthermore, the gross working capital cycle time for Maruti Suzuki was only 31.18 days; whereas the gross working capital cycle time for Mahindra was 58.03 days; thus demonstrating that Maruti has been able to manage its working capital more efficiently than Mahindra. Additionally, although both companies have reported net working capital cycles in negative; which implies that they have used their suppliers' credits effectively; however, Mahindra's cycle time is far more negative (-23.21 days); which indicates that Mahindra relies heavily on payables financing.

Table 2. Descriptive Statistics of Key Variables

	Maruti Suzuki Ltd.				Mahendra and Mahendra Ltd.			
	Min	Max	Mean	SD	Min	Max	Mean	SD
GWC	2201.22	12636.15	5868.24	2795.471	2685.73	14878.49	7237.71	3044.93
NWC	-8628.2	5111.3	-817.17	4603.156	-885.08	5661.69	2419.20	1866.20
RMCP (Days)	10.89	19.87	15.332	2.886	15.17	21.6	17.679	2.573
WIPCP (Days)	0.5	1.66	1.142	0.330	0.77	2.35	1.477	0.379
FGCP (days)	3.97	8.53	6.357	1.307	13.25	22.62	17.813	2.849
DCP (days)	5.96	10.81	8.347	1.541	16.36	28.89	21.061	3.266
Gross WCC (days)	24.11	38.75	31.177	3.619	50.63	73.05	58.029	6.035
CCP (days)	30.98	62.8	50.537	9.766	61.47	101.54	81.240	11.336
Net WCC (days)	-33.32	-6.87	-19.359	8.154	-38.36	-10.84	-23.211	7.781

Source: Author's own presentation based on statistical output

Test of Normality

The table 3 shows that all key variables have satisfied the conditions for normality with respect to the two companies: Maruti Suzuki Ltd. and Mahindra & Mahindra Ltd. by way of use of the Shapiro-Wilk Test. As seen from the table, p-

values greater than 0.05 were obtained for each variable of both Maruti Suzuki, and Mahindra & Mahindra, which confirms that the normality condition was met, so it can be concluded that the data set is quite good behaved and thus it permit to used parametric statistical tests like t-test, correlation, regression etc.

Table 3. Test of Normality of Key Variables

	Maruti Suzuki Ltd.		Mahendra and Mahendra Ltd.		Decision
	Shapiro-Wilk Statistic	Sig. (p-value)	Shapiro-Wilk Statistic	Sig. (p-value)	
GWC	0.986	0.994	0.883	0.052	Normally Distributed
NWC	0.943	0.416	0.959	0.666	Normally Distributed
RMCP (Days)	0.905	0.113	0.773	0.200	Normally Distributed
WIPCP (Days)	0.933	0.307	0.969	0.847	Normally Distributed
FGCP (days)	0.972	0.889	0.954	0.582	Normally Distributed
DCP (days)	0.941	0.392	0.946	0.468	Normally Distributed
Gross WCC (days)	0.926	0.234	0.974	0.918	Normally Distributed
CCP (days)	0.933	0.302	0.923	0.211	Normally Distributed
Net WCC (days)	0.921	0.200	0.965	0.779	Normally Distributed

Source: Author's own presentation based on statistical output

Test of Homogeneity of Variance

The F-tests to check on the homogeneity of variance, shown in Table 4 provide information regarding how many of the important variables are homogeneous in their variances. Most variables examined including Gross WCC, Net WCC, RMCP, WIPCP, CCP, and Gross WC have a p-value of over 0.05, indicating that they satisfy the homogeneity of variance. Therefore, it can

be assumed that there is no statistical difference in the variance of the two companies which will allow the use of standard parametric tests like the independent samples t test. Some variables such as FGCP ($p=0.018$) and DCP ($p=0.015$) do not satisfy this condition, but also Net WC does ($p=0.001$). These results indicate that these three variables have different levels of variation between the two companies.

Table 4: Test of Homogeneity of Variance

Variables	F Statistic	Significance (p-value)	Decision
Gross WCC	2.135	0.155	Homogeneity
Net WCC	0.192	0.665	Homogeneity
RMCP	0.444	0.511	Homogeneity
WIPCP	0.019	0.892	Homogeneity
FGCP	6.357	0.018	Heterogeneity
DCP	6.718	0.015	Heterogeneity
CCP	0.204	0.655	Homogeneity
Gross WC	0.004	0.951	Homogeneity
Net WC	13.718	0.001	Heterogeneity

Source: Author's own presentation based on statistical output

t-test for Mean Difference

The study's results, as shown in Table 5, test whether there is a statistical significance in the means of different working capital component elements of the two companies (Maruti Suzuki Limited and Mahindra & Mahindra Limited) by employing the independent samples t-test. Generally speaking, for all but one of the variables listed (Gross WCC, Net WCC, RMCP, WIPCP, CCP, and Gross WC), the p-value associated with each variable exceeds .05. Therefore, the null hypothesis was accepted; this suggests that statistically there is no difference in the respective components used for working capital by either company. In addition, it also suggests that both companies have similarities in how they

operate their working capital for those various components.

Additionally, statistically significant differences exist among certain other key working capital variables. The p-values associated with FGCP (.000), DCP (.000), and Net WC (0.025) were found to be below .05. As such, the null hypothesis was rejected. Therefore, based upon the data collected and analysed from these three components (finished goods inventory management, accounts receivable collections, and total net working capital levels), there exists a statistically significant difference between the operations of the two companies regarding these three specific working capital components.

Table 5: t-Test for difference of mean

Variables	t-Statistic	Significance (p-value)	Decision
Gross WCC	2.135	0.155	H0Accepted
Net WCC	0.192	0.665	H0Accepted
RMCP	0.444	0.511	H0Accepted
WIPCP	0.019	0.892	H0Accepted
FGCP	-13.676	0.000	H0Rejected
DCP	-13.171	0.000	H0Rejected
CCP	0.204	0.655	H0Accepted
Gross WC	0.004	0.951	H0Accepted
Net WC	-2.438	0.025	H0Rejected

Source: Author's own presentation based on statistical output

Correlation Matrix

The correlation analysis found in the correlation matrix provided in Table 6 reveals the inter-relationship between the working capital components and profitability for Mahindra & Mahindra Ltd. A number of statistically significant relationships were identified among the variables studied. Specifically, an extremely high positive correlation was observed between the gross working capital cycle (GMCC) and both the factory gate collection period (FGCP) (0.890, $p < 0.01$) and the creditor period (CCP) (0.763, $p < 0.01$). These results indicate that as the inventory holding period increases and the time it takes to collect money from creditors increases, so too does the total duration of the company's operations cycle. Similar to this, a highly significant positive association was also identified between the raw material working capital cycle (RWCC) and both the gross working capital cycle (GWC) (0.688, $p < 0.01$) and the net working capital cycle (NWC) (0.712, $p < 0.01$). This indicates that greater investments made by companies in their working capital are directly

related to longer operational cycles. Concerning profitability, an extremely high negative correlation was identified between returns on assets (ROA) and all four working capital cycle measurements: GMCC (-0.874, $p < 0.01$); FGCP (-0.754, $p < 0.01$); CCP (-0.641, $p < 0.05$); and DCP (-0.556, $p < 0.05$). This demonstrates that greater durations of working capital cycles, combined with slower collections of accounts receivable, result in lower financial performance for companies. In addition, a moderate level of negative association was identified between ROA and NWC (-0.656, $p < 0.01$). This suggests that investing excess amounts into working capital decreases profit margins. Finally, a high degree of negative correlation was identified between NWCC and CCP (-0.865, $p < 0.01$), which highlights the importance of managing payables in order to reduce the net working capital cycle. Overall, these results demonstrate that effective management of the various components of working capital (specifically inventory and accounts receivable) plays a critical role in increasing profitability at Mahindra & Mahindra Ltd.

Table 6: Correlation Matrix for Mahendra and Mahendra Ltd.

Variable s	GMC C	NWC C	RWC C	WIPP C	FGCP	DCP	CCP	GWC	ROA	NW C
GMCC	1									
NWCC	-0.336 (0.221)	1								
RWCC	0.594 (0.020)	-0.438 (0.102)	1							
WIPPC	0.155 (0.582)	-0.361 (0.187)	-0.172 (0.540)	1						
FGCP	0.890 (0.000)	-0.164 (0.560)	0.663 (0.007)	-0.126 (0.655)	1					
DCP	0.586 (0.022)	-0.091 (0.748)	-0.248 (0.373)	0.415 (0.124)	0.264 (0.341)	1				
CCP	0.763 (0.001)	-0.865 (0.000)	0.617 (0.014)	0.330 (0.230)	0.586 (0.022)	0.374 (0.169)	1			
GWC	0.430 (0.110)	-0.135 (0.633)	0.688 (0.005)	-0.711 (0.003)	0.667 (0.007)	-0.247 (0.375)	0.321 (0.243)	1		
ROA	-0.874 (0.000)	0.256 (0.357)	-0.491 (0.063)	-0.132 (0.640)	-0.754 (0.001)	-0.556 (0.031)	-0.641 (0.010)	-0.277 (0.317)	1	
NWC	0.692 (0.004)	-0.433 (0.107)	0.712 (0.003)	-0.369 (0.175)	0.807 (0.000)	0.057 (0.841)	0.665 (0.007)	0.801 (0.000)	-0.656 (0.008)	1

Source: Author's own presentation based on statistical output

The correlation table found in Table 7 presents the correlations between working capital components and profitability for Maruti Suzuki Limited. As can be seen, there was a very strong positive correlation ($p < 0.01$) between the total Working Capital Cycle (GWCC) as measured by Raw Material Periods plus Work-In-Progress Periods (WIPPC). This indicates that both the length of time materials sits around waiting to be used and the amount of time goods are sitting around waiting to be sold represent two major components of an organization's Operating Cycle. There is also a very strong positive association between Raw Materials Period (RMCP) and Goods Workings Capital (GWC); this suggests that organizations with larger amounts of inventory tend to have higher working capital investments. There were several significant correlations identified within the Net Working Capital Component (NWCC) analysis. NWCC had

a highly significant negative correlation (-0.934 , $p < 0.01$) with Current Payable Period (CCP), which highlights how important payables are to shortening the Net Working Capital Cycle. A further significant negative correlation was established between WIPPC and Net Working Capital (NWC): this suggests that longer production cycles may result in lower Net Working Capital efficiency. With respect to profitability measures, Return On Assets (ROA) was shown to have a significant negative relationship (-0.587 , $p < 0.05$) with Net Working Capital; this suggests that higher levels of Net Working Capital are likely to negatively affect profit margins. While the majority of the remaining variables, including GWCC, RMCP and FGCP did not show any statistically significant associations with ROA; it implies that each component of working capital may independently have only a limited effect on profitability.

Table 7: Correlation Matrix for Maruti Suzuki Ltd.

Variables	GWCC	NWCC	RMCP	WIPPC	FGCP	DCP	CCP	GWC	NWC	ROA
GWCC	1									
NWCC	-0.268 (0.335)	1								
RMCP	0.913 (0.000)	-0.251 (0.367)	1							
WIPPC	0.754 (0.001)	-0.515 (0.050)	0.710 (0.003)	1						
FGCP	0.193 (0.491)	-0.618 (0.014)	0.052 (0.853)	0.085 (0.763)	1					
DCP	0.314 (0.254)	0.476 (0.073)	0.074 (0.794)	0.154 (0.583)	-0.512 (0.051)	1				
CCP	0.594 (0.020)	-0.934 (0.000)	0.548 (0.035)	0.709 (0.003)	0.587 (0.021)	-0.281 (0.311)	1			
GWC	0.687 (0.005)	-0.137 (0.626)	0.796 (0.000)	0.683 (0.005)	-0.098 (0.729)	0.060 (0.833)	0.369 (0.176)	1		
NWC	-0.397 (0.143)	0.422 (0.117)	-0.509 (0.052)	-0.556 (0.031)	-0.309 (0.262)	0.403 (0.136)	-0.500 (0.058)	-0.722 (0.002)	1	
ROA	-0.091 (0.747)	-0.344 (0.209)	-0.074 (0.795)	0.092 (0.745)	0.215 (0.441)	-0.279 (0.315)	0.254 (0.362)	0.220 (0.431)	-0.587 (0.022)	1

Source: Author's own presentation based on statistical output

Result of Regression Analysis

The regression results shown in Tables 8 and 9 with model fit statistics, give insight into the connection between working capital management and profitability at Mahindra & Mahindra Ltd. Since the overall model is statistically significant ($F = 8.589$, $p < .006$), it can be concluded that there exists an effect of the independent variables on Return on Assets (ROA) as a whole. As well, since the R^2 is equal to 0.896; the selected working capital variables explain about 89.6 % of the variance in profitability. In addition to this; the adjusted R^2 of 0.791 also provides evidence of a high degree of explanatory power when controlling for the number of predictor variables. Gross Working Capital Cycle (GWCC) has a positive and statistically significant effect on ROA ($\beta = 0.939$, $p < .01$); and thus, effective management of the total operational cycle contributes to better financial performance. On

the other hand, Raw Materials Conversion Period (RMCP) ($\beta = -0.887$, $p < .05$), and Debtors Collection Period (DCP) ($\beta = -0.569$, $p < .05$) both show a significant negative association with ROA; and therefore, longer conversion and collections timeframes negatively affect profitability. Therefore, the findings indicate that managing raw materials and accounts receivable efficiently is very important. Conversely, although several other working capitals related metrics such as Net Working Capital Cycle (NWCC), Work-In-Progress Conversion Period (WIPPP), Finished Goods Conversion Period (FGCP), Gross Working Capital (GWC), and Net Working Capital (NWC) were analyzed and tested within this study, none of these measures demonstrated statistical significance; and therefore; it may be inferred that they do not directly or measurably affect ROA.

Table 8. Result of Regression Analysis for Mahendra and Mahendra Ltd.

Variables	Coefficient	Std. Error	t-value	Significance (p-value)
Constant	33.141	6.918	4.791	0.002
GWCC	0.939	0.386	4.396	0.000
NWCC	-0.074	0.204	-0.362	0.728
RMCP	-0.887	0.373	-2.375	0.049
WIPPC	3.050	6.302	0.484	0.643
FGCP	-0.406	0.838	-0.485	0.643
DCP	-0.569	0.221	-2.577	0.037
GWC	0.001	0.001	1.497	0.178
NWC	-0.001	0.001	-1.250	0.251

Source: Author's own presentation based on statistical output

Table 9. Model fitness outcome for Mahendra and Mahendra Ltd.

Statistic	Value
F-Statistic	8.589
Significance (F)	0.006
R-Square	0.896
Adjusted R ²	0.791

Source: Author's own presentation based on statistical output

The Tables 10 and 11 show an overview of how each component of working capital influences the profitability of Maruti Suzuki Limited. The F-statistic in Table 11 provides evidence for statistical significance and the p-Value equals 0.000. Therefore, all of the independent variable have a combined effect on Return On Assets (ROA). The R-Square Value in Table 11 indicates that there is about 69.8 % of the variance in profitability that can be attributed to the Model. However, when we adjust for the number of predictor used in our Model, this is reduced to about 39.5%. We also see that, out of the variables included in the study, GWCC is the most influential variable towards profitability. It has a Positive Significant Beta Coefficient (Beta = .732, $P < .01$) which indicates that if there is effective

management of the gross working capital cycle then it will contribute to better company performance. NWC however has a Negative Significant Beta Coefficient (Beta = -.001, $P < .05$) which indicates that investing too much money into working capital can negatively affect company performance. This could be because of inefficient use of resources or unused working capital. In addition, other variables such as NWCC, RMCP, WIPPC, FGCP, DCP, and GWC were found to be Statistically Not Significant. This implies that these variables have little or no effect on the profitability of the company. Even though DCP was found to have a positive coefficient, its marginal significance at a 10% level of confidence means it should be treated with caution.

Table 10. Result of Regression Analysis for Mahendra and Mahendra Ltd.

Variables	Coefficient	Std. Error	t-value	Significance (p-value)
Constant	11.625	7.788	1.493	0.179
GWCC	0.732	0.376	4.608	0.000
NWCC	-0.405	0.449	-0.902	0.397
RMCP	-0.297	0.163	-1.825	0.111
WIPPC	-7.199	4.905	-1.468	0.186
FGCP	-0.133	0.990	-0.134	0.897
DCP	1.599	0.801	1.996	0.086
GWC	0.00007263	0.001	0.115	0.911
NWC	-0.001	0.000	-2.452	0.044

Source: Author's own presentation based on statistical output

Table 11. Model fitness outcome for Maruti Suzuki Ltd.

Statistic	Value
F-Statistic	7.306
Significance (F)	0.000
R-Square	0.698
Adjusted R ²	0.395

Source: Author's own presentation based on statistical output

Discussion

Empirical evidence in this study will contribute to an understanding of how Working Capital Management contributes to Profitability of the firms being studied specifically, Maruti Suzuki Ltd. and Mahindra & Mahindra Ltd. Results of the t-tests indicated most Working Capital items did not show statistically significant differences between the two organizations, which suggested that both companies were managing their working capital very similarly. Statistical significance was identified however in Finished Goods Conversion Period, Debtors Collection Period and Net Working Capital for both firms, which indicated variations in Inventory Handling, Receivable Efficiency, and Liquidity Strategies. This was consistent with previous research which had found although firms within the same industry could employ similar financial structures they could operate using different methods or

processes at the firm level ([Singhania & Mehta, 2017](#); [Sharma & Kumar, 2011](#))

Correlation Analysis identified meaningful associations between working capital components and profitability. There was a strong negative association identified by Mahindra & Mahindra, for example, between profitability and Gross Working Capital Cycle, Finished Goods Conversion Period, Creditors Payment Period and Debtors Collection Period. The implication therefore of these longer operating cycles is that they would have a detrimental effect on firm performance. Similar results were also identified by Maruti Suzuki where there was a negative association identified between profitability and Net Working Capital. Therefore, if too much money is invested in current assets it can lead to inefficiency. These results are consistent with the

traditional view that effective working capital management particularly via shortening Cash Conversion Cycles leads to enhanced profitability ([Ukaegbu, 2014](#); [Deloof, 2003](#)). Additionally, the large number of inter-associations between working capital components clearly highlights the interdependent nature of managing inventories, accounts receivable and accounts payable.

Regression analysis further identifies the specific factors affecting profitability for both firms. In relation to Mahindra & Mahindra, Gross Working Capital Cycle has been shown to be positively significant whilst Raw Material Conversion Period and Debtors Collection Period have been shown to be significantly negatively impacting on firm performance. Therefore, delays in production and collecting monies due from customers can be expected to negatively affect company performance. For Maruti Suzuki, Gross Working Capital Cycle has a positive impact on profitability, whilst Net Working Capital has a significant negative impact. As such it can be concluded that an excess of working capital is likely to result in inefficiency. These results are consistent with the Trade Off Theory which focuses on achieving the correct balance between liquidity and profitability ([Smith, 1980](#)).

In general terms, therefore, whilst both firms appear to manage their working capital effectively well the results indicate that profitability is more dependent upon the efficiency of inventory and account receivable management than other areas of working capital. The results add emphasis to the importance of maintaining optimum levels of working capital as excessive levels can potentially detract from profitability particularly in highly capital intensive industries. The conclusions drawn from this study are consistent with recent studies which highlighted the importance of working capital management in improving company performance and value ([Makori & Jagongo, 2013](#); [Singh et al., 2017](#)).

Conclusion

The current research investigates how efficiently managing working capital affects profitability within India's automotive industry via a comparison of two major automobile companies, namely maruti suzuki limited and mahindra & mahindra limited, from 2010-2025. The results of this investigation clearly show that effectively managing different working capital elements are important to company performance. Working capital practices for both companies are generally similar, however there are differences within specific elements such as inventory management, receivable collection, and net working capital positioning. Working capital variables specifically affect profitability rather than all working capital variables combined. For example, the longer the receivables collection process and the production cycle time, generally lower profitability will result; conversely, effective working capital cycle times can positively affect company financial performance. Furthermore, while there is an inverse relationship between net working capital and profitability, it appears that investing too much in short-term assets (i.e., current assets) can be inefficient and may ultimately result in lower returns on those investments. In this swift, this study found that achieving an optimal balance of liquidity and profitability is critical for success for companies operating in highly capital intensive industries. Not only do effective working capital strategies improve the operation of a firm, they contribute to value creation and financial sustainability. The results of this research support previously developed theories and empirical evidence regarding the significance of reducing the length of time required to convert raw materials into saleable products and improving the management of current assets and liabilities. Therefore, companies must have working capital strategies that are continually changing based upon their individual needs or circumstances so that companies can continue to maximize their profitability in a rapidly changing environment.

Limitations of the Study

Although this research provides many interesting results and conclusions it also has a number of shortcomings. Firstly, the scope of the research is limited to only two car manufacturers operating in India; therefore, the validity of the research can be questioned with regard to its applicability beyond these two organizations. Secondly, since the research is based upon secondary information obtained from publicly available financial reports there exists the possibility for reporting errors/omissions. Thirdly, while the working capital measures were identified and selected as having an impact on profitability, they represent only some of the possible influences upon a company's profit performance (e.g. macroeconomic conditions, competitive forces within a particular market, specific business strategies adopted by each firm

Direction for Future Research

Future research could expand upon this work with a larger set of firms from multiple industries to increase the generalizability of the results. A comparative analysis between countries (e.g., developing vs. developed) or within industries would allow researchers to better understand the significance of working capital management in various settings. Future studies could use more sophisticated methodologies than those used here (i.e. panel data analysis, dynamic models, etc.) to identify potential causal mechanisms between working capital management and firm performance. Future studies that examine how macroeconomic conditions, digital finance and disruptions in supply chains affect working capital efficiency will be helpful. Studies that include qualitative aspects (i.e. manager's decisions and corporate governance) to create richer analyses will also be beneficial. Examining the effects of new technologies and sustainable business practices in working capital management is an area where academia and business have the ability to grow and develop.

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