



Impact of Working Capital Management on Profitability and Market value of the Logistics Industry

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ABSTRACT: A company needs sufficient non-current assets and current assets for the successful running of the business and maximization of the wealth of the firm. Especially, in the short-run current assets or working capital management plays an important role in the success or failure of the firm and its impact on its profitability of the firm. This article aims to examine the impact of working capital management on the performance and as well as the market value of companies in the logistics industry. This study used the fixed effect panel data analysis with a data set covering six logistics companies listed on the Bombay Stock Exchange, India for the period 2013-2022.

To estimate the relationship between working capital management and the performance of companies used Return on Assets (ROA), Return on Equity (ROE), and Market value to Book value (MVBV) as dependent variables in the research models. The main results indicate that the positive relationship between working capital, market value, and profitability is not very clear. Logistics companies' sales are negatively associated with MVBV and ROE of logistics companies. The cash conversion cycle is found statistically not significant, and the relationship between CCC and profitability is negative. Overall, of the study, it is concluded that working capital has an impact on the profitability of logistics companies in India.

KEYWORDS: BSE, Cash Conversion Cycle, Logistic Industry, Market value, Profitability, Working capital.

INTRODUCTION

There are three roles that a finance manager must do in any firm, these tasks are managing long-term assets, managing long-term capital, and handling short-term assets and liabilities. Working capital is managed in conjunction with short-term assets and liabilities (Khan, 2002). The company must finance with the least expensive sources of capital to provide the best profits. It should also keep no unproductive assets. Liquidity and profitability are primarily important while carrying out daily operations. A profitable business requires a company to have sufficient liquidity to ensure that it can satisfy its short-term obligations and assure its ongoing cash flow (Padachi, 2006). Working Capital Management includes maintaining an optimal balance of working capital components like receivables, inventories, and payables, as well as spending cash efficiently for day-to-day operations. Working capital balance optimization entails lowering working capital requirements while maximizing revenues (Ganesan, 2007).

There is a close association between the firm's profitability and its working capital efficiency (Shin, 1998). Profitability is the promise for a firm to remain a continuing concern in the world of business. The capacity of a company to produce a profit is referred to as profitability. Profit is calculated by comparing revenue to the costs associated with it (Salaudun, 2001). The profit of a business in absolute terms provides information about the outcome of its operations. Profitability is a popular financial performance metric. Profitability may be defined in two ways: commercial/private profitability and public profitability. Although the use of public profitability, which is founded on economists' concepts of costs and benefits, is frequently favorable for the corporation to invest in short-term assets and finance with short-term liabilities (Scherr, 2007).

Working capital management is critical to sustaining the firm's financial health during the usual course of operations. Although the measure of commercial profitability appears to be a more relevant measure of the performance of public companies, the measure of genuine opportunity cost has been utilized in this study. This is because commercial profitability is commonly employed in India to assess the performance of state firms. Profitability ratios are calculated in two ways: the first one is profitability in proportion to sales and the second one is the profitability of the investment. The major indicators of profitability are gross profit margin (GPM), net operating margin (NOM), return on total assets (ROTA), return on equity (ROE), and return on investment (ROI). As a result, profit is an absolute metric, whereas profitability is a relative indicator of an enterprise's operational efficiency.



Effective working capital management is critical since it has a substantial impact on corporate profitability and consequently the firm's existence in the market. If a company reduces its investment in existing assets, the resultant cash may be spent on value-creating lucrative ventures, increasing the company's growth potential and shareholder return. However, management may trace liquidity issues back to underinvestment in working capital. The capacity of financial managers to successfully and efficiently manage their receivables, inventory, and payables has a substantial impact on the success and profitability of the firm. This article is divided into five parts, the first part is the introduction, the second part is the literature review, the third part is a research methodology, the fourth part is data analysis and the fifth part is the conclusion.

LITERATURE REVIEW

Marisetty and Madasu (2020), they concluded from their study that significant negative relation observed between CCC and profitability of the firm in more classifications that means the shorter length of cash conversion cycle increase the profitability of the firm. Narman (2019), said that net working capital has a favorable relationship with profitability. He indicates that logistics businesses may boost profitability by lengthening the average collection period and that less profitable logistics firms pay their invoices later. Paying bills on time or before the due date to receive discounts may boost profitability.

Tan & Tuluca (2019) proved Cash Conversion Cycle results might not give authentic conclusions because the result depends on the computations' input. Cristea & Cristea (2018) investigated the Romanian non-finance firms trading in the Bucharest Stock Exchange from 2002 to 2016 to know the association between the company's cash conversion cycle and performance. They found the negative association between the cash conversion cycle and the performance of companies. They also found that the company's profitability can increase by decreasing the length of the cash conversion cycle. Kipkemoi, Kiru & Koima (2018) analyzed the Nairobi Securities Exchange-listed commercial and service companies to know the effect of the cash conversion cycle and inventory period on the company's financial performance. They found the cash conversion cycle and inventory conversion period have no significant association with the companies' financial performance.

Linh and Mohanlingam (2018) argued the cash conversion cycle and profitability have no significant relationship. Rizky & Mayasari (2018) examined the retail companies listed on the Indonesian Stock Exchange. They proved less length of cash conversion cycle would lead to an increase in company profitability, but the company size and company age have no significant impact on company profitability. Sugathadasa (2018) investigated the Sri Lanka stock market and found the inventory conversion period has a positive association and receivables & payables conversion periods have a negative association with company profitability, but inventory and receivables results are significant, and payables results are insignificant with profitability. He concluded that the cash conversion cycle has a significant association with its profitability in the Sri Lanka manufacturing sector.

Tsagem (2018) found a negative relation between the length of the cash conversion cycle and creditor's deferred period and inventory holding period with SMEs' profitability. Debtor's conversion period has a statistically significant negative relationship with profitability. Zenkevich & Ivankina (2018) suggested the optimization and monitoring of cash conversion cycle values sustain effective working capital management on an inter-organizational level while meeting the liquidity and return levels for each firm in a supply chain. Zhang (2018) studied diversified and focussed companies of the USA from 1980 to 2016. He concluded diversified companies have smaller inventory and Debtor's period than focused companies.

Ajanthan & Kumara (2017) investigated the 90 Sri Lankan forms listed in the Colombo Stock Exchange and suggested the less length of cash conversion cycle useful to all company stakeholders. Zeidan & Shapir (2017) understood the effect of decreased Cash Conversion Cycle spread improves working capital management that increases the free cash flows to equity, stock prices, and profits. Aravind (2016) examined the 100 manufacturing firms in India for the period from 2005 to 2015. He found that the cash conversion cycle positively associated with the net profit margin and negatively associated with return on equity. He also found that higher accounts payables for Indian manufacturing companies while maintaining accounts receivables and inventory outstanding.

Zakari & Saidu (2016) studied the Nigerian listed telecom companies and found company cash conversion cycle and profitability have a significant positive association. Das (2015) suggested the right cash conversion cycle reduces the need for outside borrowing and holds more cash, and CCC is an effective tool to assess the company's liquidity. Mawutor (2014) found that the cash conversion cycle has a significant negative association with the accounts receivables period and accounts payables period and found that the inventory turnover period has a positive association with profitability. He suggested that manufacturing companies should maintain their working capital more effectively to keep all others in equilibrium.



Ntui Ponsian and Kiemi Chrispina (2014), have used thirty observations from three DSE-listed manufacturing businesses that qualified for the ten-year financial data required for the study. The quantitative research technique is utilized to get the results, and correlation analysis is performed to determine the nature of the link between the variables. Firms can obtain a lasting competitive advantage by effectively and efficiently utilizing the organization's resources and enhancing the cash conversion cycle. Ashok (2013) argues that it is not always required for the cash conversion cycle to be higher than the profitability estimated through the return on equity and return on assets. He found a significant relationship between the cash conversion cycle length and the return on equity and assets. Manyo (2013) recommended the companies always shorten the cash conversion cycle days to increase profitability to increase wealth for shareholders.

Jayanta Chakrabarti and Bhaskar Bagchi (2012), their study emphasize the importance of skilled working capital management in ensuring firm profitability, and this aspect must form part of the company's strategic and operational thinking to operate effectively and efficiently in India's new challenging economic environment. Imad Z. Ramadan, Thair, and A.Kaddumi (2012), Profitability and Working Capital Management Working capital has a substantial impact on business performance and plays an important role in optimizing shareholder value by making the firm more profitable by shortening the cash conversion cycle and net trading cycle.

Attari and Raza (2012) concluded that the cash conversion cycle has a significant negative correlation with the company's size in terms of total assets, and the cash conversion cycle has a negative correlation with the profitability in terms of return on total assets. Mansoori & Muhammad (2012) found the economic sector's impact on the association of working capital and profitability. They also found the company profitability can be increase by managing working capital effectively. Garcia (2011) investigated the stocks listed in eleven European Stock Exchanges for 12 years and found the significant negative association between inventory conversion period, receivables conversion period, payables deferral period, cash conversion cycle, and profitability. He suggested that decreasing the length of working capital can increase the firm's profitability.

Nobance et al. (2011) studied Japanese companies to know the relationship between the company's cash conversion cycle and profitability by dividing the samples industry and company size-wise. They found the company's cash conversion cycle has a strong negative association with profitability in all industry samples except consumer goods and services industries. Amarjit Gill et al. (2010) evaluated the association between working capital management and profitability in the United States using a sample of 88 businesses registered on the New York Stock Exchange. They took these variables into account for this reason. Profitability is a dependent variable, whereas account receivable days, account payable days, inventory turnover days, and cash conversion cycle are independent variables. Control variables include business size, fixed asset ratio, and financial debt ratio. According to their findings, there is a considerable association between the cash conversion cycle and profitability. Management may add value to a company by managing the cash conversion cycle properly.

Gill, Biger, and Mathur (2010) studied the 88 companies trading in New York Stock Exchange and found a statistically significant association between the firm profitability and the length of the cash conversion cycle. According to M. A. Zariyawati, M. N. Annuar, H. Taufiq, and A.S. Abdul Rahim (2010), firms that manage the tradeoff between profitability and liquidity may achieve the best working capital management. This study discovered that the cash conversion cycle is strongly adversely related to business profitability, implying that firm managers should focus on reducing the cash conversion duration to create shareholder value.

Afza and Nazir (2009), attempted to investigate the traditional relationship between working capital management policies and a firm's profitability for a sample of 172 randomly selected companies listed on the Bursa Malaysia from 2003 to 2007. The analysis discovered considerable differences in working capital requirements and financing practices across industries. They argued that managers may increase value by taking a cautious approach to working capital investment and finance strategies. Randell & Farris II (2009) provided the methodology to recognize and measure the abundant chances of profitability throughout the supply chain. Uyar (2009) found that the cash conversion cycle has a significant negative correlation with company size and company profitability.

Koumanakos (2008) revealed the higher length of inventory period of a company; it reduces the rate of return. Raheman and Nasr (2007), studied the influence of several working capital management factors on net operational profitability in 94 Pakistani firms registered on the Karachi Stock Exchange over 6 years from 1999 to 2004. According to the findings of the study, there was a negative association between working capital management factors such as the average collection period, inventory turnover in days, average collection period, cash conversion cycle, and profitability. Furthermore, they found a positive association between business size (as assessed by the natural logarithm of sales) and profitability.



Teruel & Solano (2007) investigated the 8,872 SME's of Spanish firms covering from 1996 to 2002. They suggested the managers create wealth by shortening Debtor's conversion and inventory conversion period and suggested from their research that reducing the length of the cash conversion cycle also increases the company's profitability. Tryfonidis and Lazaridis (2006), have researched the relationship between working capital management and corporate profitability of Athens Stock Exchange listed companies. This link was investigated using a sample of publicly traded corporations from 2001 to 2004. The regression study revealed a statistically significant relationship between profitability (as assessed by gross operating profit) and the cash conversion cycle. Based on such findings, they stated that managers might create value for shareholders by properly managing the cash conversion cycle and keeping each component at an optimum level.

Veena Gundavelli, (2006), working capital in cash is viewed as a "hidden reservoir" of efficiency that may be used to support expansion objectives. Cash flow locked in credit, receivables, and payables may be achieved by combining business process innovations, technology, and good management. Lyroudi & Lazaridis (2000) studied the cash conversion cycle as a liquidity indicator of Greek firms' food industry. Their results indicated that the cash conversion cycle has a significant positive relationship with liquidity measures, net profit margin, and return on assets but no association with leverage ratios. Lyroudi & MaCarthy (1993) found that the cash conversion cycle has negatively associated with the current ratio, inventory conversion period, and payables deferral period but statistically not significant. But the cash conversion cycle is positively associated with the quick ratio and receivables conversion period. They also found that large companies' cash conversion cycle results are different from small companies' cash conversion cycle.

RESEARCH METHODOLOGY

Objectives of the study

1. To analyze the correlation between selected variables in the logistics industry.
2. To evaluate the selected variables' mean behaviour in the logistics industry.
3. To examine the impact of working capital management (cash conversion cycle) on the profitability of logistics companies.

Hypothesis of the study

Null Hypothesis

H₀₁: There is no significant correlation between selected variables in the logistics companies.

H₀₂: There is no significant difference in the selected variables mean of the logistic companies.

H₀₃: There is no significant impact of working capital management (cash conversion cycle) on the profitability of the logistics companies.

Methodology

This article mainly studies the impact of working capital management on the profitability of logistics companies in India. Correlation analysis, Anova, and fixed effect panel data analysis have been used to know the association among the working capital variables (cash conversion cycle) and profitability variables (Return on equity and Return on Assets). The financial data was collected from the financial statements of the selected six logistic companies in India for the period of 2013 – 2022. Selected companies are Container Corporation of India (CCI), Allcargo Logistics (ACL), Aegis Logistics (AL), Mahindra Logistics (ML), Transport Corporation of India (TCI), and VRL Logistics (VRL). Software used to analyze the different variables are SPSS, E-VIEWS and MS-Excel. The following three fixed effect models have been developed to test the third null hypothesis, which examines the impact of working capital management variables and profitability variables.

First Model: the first model tests the impact of working capital variables on return on equity (ROE)

$$ROE = \beta_0 + \beta_1 CCC + \beta_2 CA + \beta_3 CATA + \beta_4 Size + e_i$$

Second Model: to test the impact of working capital variables on return on assets (ROA)

$$ROA = \beta_0 + \beta_1 CCC + \beta_2 CA + \beta_3 CATA + \beta_4 Size + e_i$$

Third model: to test the impact of working capital variables on market value to book value (MVBV)

$$MVBV = \beta_0 + \beta_1 CCC + \beta_2 CA + \beta_3 CATA + \beta_4 Size + e_i$$

Where, CCC = Cash Conversion Cycle,

CA = Current Assets,

CATA = Current Assets to Total Assets,



SIZE = Company Sales and e_i = error term.

Here the independent variable is Cash Conversion Cycle, which includes inventory, receivables, and payables; three dependent variables are ROE, ROA, and MVBV. Along with the dependent and independent variables, three more control variables used in this research are Current ratio (CR), (CATA) and Size (Log of sales).

Independent variable is

Cash Conversion Cycle (CCC) = Days Inventory Turns (DIT) + Days Receivables Outstanding (DRO) – Days Payables Outstanding (DPO)

$$\text{Days Inventory Turns (DIT)} = \frac{\text{Inventory} * 365}{\text{Sales}} \text{ days}$$

$$\text{Days Receivables Outstanding (DRO)} = \frac{\text{Accounts Receivables} * 365}{\text{Sales}} \text{ days}$$

$$\text{Days Payables Outstanding (DPO)} = \frac{\text{Accounts Payables} * 365}{\text{Sales}} \text{ days}$$

Sales have taken denominators for all three turnover ratios because Cost of Goods Sold (COGS) and credit purchases information are not available properly on public sites.

Dependent Variables are

$$\text{ROE (Return on Equity)} = \frac{\text{Net Profit Available yo Equity Shareholders}}{\text{Total Equity Shareholders Funds}} * 100$$

$$\text{ROA (Return on Assets)} = \frac{\text{Earnings before interest and Tax (EBIT)}}{\text{Total Assets}} * 100$$

$$\text{MVBV (Market Value to Book Value)} = \frac{\text{Market value of the share}}{\text{Book value of the share}} * 100$$

Control variables are

$$\text{Current ratio (CR)} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\text{CATA (Current assets to total assets)} = \frac{\text{Current Assets}}{\text{Total assets}} * 100$$

SIZE = Ln of Revenue (Ln of Sales)

DATA ANALYSIS

Table 1: Return on Equity (ROE) of selected logistic companies

Particulars	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	Average	SD
CCI	9.81	4.95	4.02	11.92	11.46	9.77	11.62	14.02	13.76	14.96	10.63	3.66
ACL	19.12	11.89	14.92	14.23	2.19	7.92	9.11	7.61	4.61	9.83	10.14	5.05
AL	29.51	12.78	2.45	10.93	13.12	9.48	12.76	26.66	6.02	12.40	13.61	8.38
ML	4.25	4.24	10.11	16.92	14.84	12.84	12.31	15.19	29.44	28.42	14.86	8.56
TCI	20.36	12.47	13.30	15.24	15.32	12.09	17.17	13.39	14.02	13.30	14.67	2.51
VRL	24.57	7.54	14.60	14.22	15.60	13.02	19.92	25.61	18.65	25.54	17.93	6.04
Average	17.94	8.98	9.90	13.91	12.09	10.85	13.82	17.08	14.42	17.41	13.64	3.18

(Source: Authors' calculations)



The above table 1 shows the return on equity (ROE) of six logistic companies in India for ten years. All the companies' ROE is fluctuating and it is not observed an increasing trend for more than three years in any company. For ten years on average, ROE is more than 10 percent in all six companies and highest in VRL with 17.93 percent. It is noticed that Mahindra Logistics ROE volatility is the highest and Transport Corporation of India's ROE volatility is lowest among the all six logistics companies. Out of 10 years, the year 2022 has the highest average of 17.94 of which four companies are above average, and the remaining two that is, Container Corporation of India and Mahindra Logistics are having very fewer returns on equity. It is found that the average ROE of six companies in the years 2021 and 2020 is a single digit, which may be due to Covid 19 company's performances are not good. In the overall Transport Corporation of India ROE is consistent, less volatile, and never touched the single digit during the ten years research period.

Table 2: Return on Assets (ROA) of selected logistic companies

Particulars	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	Average	SD
CCI	8.11	4.07	3.43	9.62	9.78	8.46	10.08	11.72	11.42	12.86	8.96	3.10
ACL	10.52	6.08	7.64	9.05	1.57	5.53	6.78	5.27	2.90	5.78	6.11	2.64
AL	18.27	7.33	1.43	7.05	8.02	5.83	8.89	18.08	3.23	7.36	8.55	5.55
ML	1.32	1.51	4.14	7.53	6.81	5.82	6.75	8.03	10.92	9.35	6.22	3.13
TCI	16.38	8.49	8.03	8.39	8.12	6.20	8.51	7.16	6.83	5.87	8.40	2.97
VRL	11.59	3.76	7.35	9.40	10.73	7.85	10.84	9.57	5.84	4.73	8.17	2.71
Average	11.03	5.21	5.34	8.51	7.51	6.62	8.64	9.97	6.86	7.66	7.73	1.87

(Source: Authors' calculations)

The above table 2 shows the return on assets (ROA) of six logistic companies in India for the period of ten years. All the companies' ROA is fluctuating and it is not observed an increasing trend for more than three years in any company. For ten years average ROA is less than 10 percent in all six companies and the highest in the Container Corporation of India with 8.96 percent. It is noticed that Aegis Logistics ROA volatility is highest and Allcargo Logistics ROA volatility is lowest among all six logistics companies. Out of 10 years, the year 2022 has the highest average of 11.03 in which three companies are above average, and the remaining three that is, Container Corporation of India, Allcargo Logistics and Mahindra Logistics are having very fewer returns on assets. It is found that the average ROA of six companies in the years 2021 and 2020 lowest compare to other years, it may be due to Covid 19 company performances are not good. In the overall Transport Corporation of India ROA is consistent, less volatile, and never went below five percent during the ten years research period.

Table 3: Market to Value to Book Value (MVBV) of selected logistic companies.

Particulars	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	Average	SD
CCI	3.42	3.57	1.92	3.00	1.27	1.02	1.13	1.10	0.66	0.42	1.75	1.17
ACL	2.81	2.02	1.58	1.89	3.37	3.34	3.77	2.42	0.91	1.44	2.36	0.95
AL	7.15	7.25	6.41	9.82	12.39	7.29	20.29	3.07	1.56	1.22	7.64	5.66
ML	6.31	4.20	5.92	7.31	7.58	6.59	3.09	5.49	4.27	9.03	5.98	1.79
TCI	3.65	3.45	2.21	2.96	3.26	2.76	3.83	3.47	1.39	1.56	2.85	0.87
VRL	8.46	6.34	3.37	3.83	6.65	5.25	5.65	9.81	7.66	9.49	6.65	2.21
Average	5.30	4.47	3.57	4.80	5.75	4.38	6.29	4.23	2.74	3.86	4.54	1.05

(Source: Authors' calculations)

The above table 3 shows the Market to Value to Book Value (MVBV) of six logistic companies in India for the period of ten years. All the companies' MVBV is fluctuating and it is not observed an increasing trend for more than three years in any company. For ten years average MVBV is more than 1 percent and less than 8 percent in all six companies and the highest in Aegis Logistics with 7.64 percent. It is noticed that Aegis Logistics MVBV volatility is highest and Transport Corporation of India MVBV volatility is lowest among all six logistics companies. Out of 10 years, the year 2016 has the highest average of 6.29 in which one company MVBV only influences average value. It is found that the average MVBV of six companies in the years 2014 and 2020 is less



compared to other years, it may be due to the Covid-19 market price of the shares are not good in 2020. In the overall Transport Corporation of India MVBV is consistent, less volatile, and never observed more volatility during the ten years.

Table 4: Current Ratio (CR) of selected logistic companies.

Particulars	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	Average	SD
CCI	0.284	0.261	0.250	0.375	0.300	0.264	0.138	0.394	0.413	0.481	0.316	0.100
ACL	0.970	0.710	0.900	1.020	1.160	1.030	1.070	1.280	0.880	0.710	0.973	0.181
AL	1.100	0.700	0.860	0.710	0.750	0.570	0.900	1.360	0.760	1.220	0.893	0.254
ML	1.160	1.330	1.390	1.510	1.540	1.590	1.990	1.980	1.420	1.280	1.519	0.277
TCI	3.030	1.820	1.470	1.400	1.290	1.200	1.130	1.290	1.110	1.110	1.485	0.584
VRL	0.650	0.680	0.720	1.390	1.070	0.800	0.720	0.510	0.400	0.480	0.742	0.295
Average	1.199	0.917	0.932	1.068	1.018	0.909	0.991	1.136	0.831	0.880	0.988	0.118

(Source: Authors' calculations)

The above table 4 shows the current assets (CA) of six logistic companies in India for the period of ten years. All the companies CA is fluctuating and it is not observed an increasing trend for more than three years in any company. For the ten years, the average CA is less than one in four companies and highest in Mahindra Logistics with 1.519 times. It is noticed that the Transport Corporation of India CA volatility is the highest and Container Corporation of India CA volatility is lowest among the all six logistics companies. Out of 10 years, the year 2022 has the highest average of 1.199 in which three companies are above average, and the remaining three that is, Container Corporation of India, Allcargo Logistics, and Vijayananda Road Lines are having very fewer current assets. It is found that the average CA of six companies in the years 2013 and 2014 lowest compare to other years and also years 2021 and 2022 average CA is less than one, it may be due to Covid 19 company performances are not good. In the overall Transport Corporation of India CA is highly volatile and never went below the one during the ten years research period and in the year 2022, it reached three times.

Table 5: Cash Conversion Cycle (CCC) of selected logistic companies

Particulars	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	Average	SD
CCI	6.46	-5.82	-12.81	-18.85	-17.04	-15.30	-13.14	-14.44	-14.22	-14.87	-12.00	7.33
ACL	-31.56	-8.20	-28.84	-23.70	4.27	0.16	2.18	6.50	11.37	9.22	-5.86	16.31
AL	14.57	16.87	30.15	25.87	27.88	23.30	52.45	23.75	20.86	30.69	26.64	10.49
ML	-50.98	-40.69	-22.94	-10.11	2.38	2.12	-0.29	-5.73	-6.91	-2.93	-13.61	18.65
TCI	-40.79	-29.56	-7.16	10.89	3.53	3.05	-0.26	-4.91	-5.96	-2.30	-7.35	15.83
VRL	16.00	23.57	20.72	19.01	19.25	18.92	21.08	21.02	21.85	22.59	20.40	2.18
Average	-14.38	-7.31	-3.48	0.52	6.71	5.38	10.34	4.37	4.50	7.07	1.37	7.63

(Source: Authors' calculations)

The above table 5 shows the Cash Conversion Cycle (CCC) of six logistic companies in India for the period of ten years. Only Aegis Logistics and VRL logistics CCC are positive throughout the research period but the other four companies' CCC were some years negative and some years positive. For ten years average CCC is positive in two companies and highest in Aegis Logistics with 26.64 days. It is noticed that Mahindra Logistics CCC volatility is highest and VRL Logistics CCC volatility is lowest among all six logistics companies. Out of 10 years, the year 2022 has the lowest average of -14.68 in which three companies are above average, and the remaining three that is, Transport Corporation of India, Allcargo Logistics and Mahindra Logistics are having negative Cash Conversion Cycle. It is found that the average CCC of six companies in the years 2021 and 2020 negative compared to other years, it may be due to Covid 19 company performances are not good. The overall VRL Logistics CCC is consistent, less volatile, and never went below the negative during the ten years research period.



Table 6: Current Assets to Total Assets (CATA) of selected logistic companies for ten years

Particulars	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	Average	SD
CCI	0.284	0.261	0.250	0.375	0.300	0.264	0.138	0.394	0.413	0.481	0.316	0.100
ACL	0.336	0.277	0.282	0.205	0.231	0.213	0.212	0.178	0.197	0.183	0.231	0.051
AL	0.206	0.135	0.174	0.168	0.211	0.194	0.167	0.255	0.200	0.249	0.196	0.037
ML	0.621	0.694	0.680	0.819	0.810	0.843	0.848	0.890	0.858	0.825	0.789	0.090
TCI	0.650	0.770	0.800	0.600	0.910	0.820	0.890	0.890	0.800	0.870	0.800	0.104
VRL	0.124	0.147	0.148	0.176	0.199	0.167	0.163	0.160	0.133	0.149	0.156	0.022
Average	0.370	0.381	0.389	0.391	0.444	0.417	0.403	0.461	0.434	0.460	0.415	0.033

(Source: Authors' calculations)

The above table 6 shows the Current Assets to Total Assets (CATA) of six logistic companies in India for the period of ten years. For ten years average CATA is less than 0.5 times in all six companies and highest in Mahindra Logistics with 0.789 times. It is noticed that Transport Corporation of India's CATA volatility is the highest and Aegis Logistics CATA volatility is lowest among the all six logistics companies. Out of 10 years, the year 2013 has the highest average of 0.460 in which three companies are above average, and the remaining three that is, Aegis Logistics, Allcargo Logistics and VRL Logistics are having very less Current Assets to Total Assets. It is found that the average CATA of six companies is between 0.30 to 0.50 during the research period. Overall, all the companies maintained consistent CATA but some companies had the lowest CATA and some companies had the highest CATA during the ten years research period.

Table 7: Correlation between selected variables

Particulars		ROE	ROA	MV To BV	Sales	CR	CCC	CA to TA
Return on Equity (ROE)	Pearson	1	.740**	.261*	-0.067	0.179	0.126	0.141
	Correlation		0.000	0.044	0.612	0.170	0.339	0.283
	Sig. (2-tailed)							
Return on Assets (ROA)	Pearson	.740**	1	-0.001	0.072	0.141	-0.005	-0.011
	Correlation			0.995	0.584	0.282	0.970	0.934
	Sig. (2-tailed)							
Market Value To Book Value	Pearson	.261*	-0.001	1	-	0.026	.501**	-0.138
	Correlation				.396**			
	Sig. (2-tailed)							
Sales	Pearson	-0.067	0.072	-.396**	1	-0.147	-.662**	.301*
	Correlation							
	Sig. (2-tailed)							
Current Ratio (CR)	Pearson	0.179	0.141	0.026	-0.147	1	-0.233	.616**
	Correlation							
	Sig. (2-tailed)							
Cash Conversion Cycle (CCC)	Pearson	0.126	-0.005	.501**	-	-0.233	1	-.446**
	Correlation				.662**			
	Sig. (2-tailed)							
N		60	60	60	60	60	60	60



Current Assets to Total Assets Ratio	Pearson Correlation Sig. (2-tailed) N	0.141 0.283 60	-0.011 0.934 60	-0.138 0.293 60	.301* 0.019 60	.616** 0.000 60	-.446** 0.000 60	1 60
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(Source: Authors' calculations), **. Correlation is significant at the 0.01 level (2-tailed).

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

Table 7 explains the correlation between selected variables of six companies for ten years. Return on equity has a strong positive correlation with return on assets and is significant at the 1 percent level. ROE has also a significant positive correlation with market value to book value at a 5 percent level. Other than those two variables ROE has not having any significant correlation with the other four variables. Return on assets has a strong positive correlation with the ROE at 1 percent level significance and not showing a significant correlation with the other variables. Market value to book value has a positive significant correlation with the ROE at a 5% level, a positive significant correlation with the cash conversion cycle at a 1 percent level, and a negative significant correlation with the sales at a 1 percent level. MVBV not showing any significant correlation with the return on assets, current ratio, and CATA variables.

Sales have a negative significant correlation with the MVBV and cash conversion cycle at a 1 percent level of significance and a positive significant correlation with the CATA at a 5 percent level. Sales are not showing any correlation either with the profitability ratio like ROE and ROA or liquidity ratio like the current ratio. Even the current ratio also not have any significant correlation either with the profitability ratios or sales or cash conversion cycle. The cash conversion cycle has no significant correlation with profitability ratios and liquidity ratios but it has a negative significant correlation with the sales and CATA at 1 percent level significance and positive significant relation with the MVBV at 1 percent level significance. The current assets to total assets ratio are not having a significant correlation with the dependent variables such as ROE, ROA, and MVBV but CATA has a significant correlation with the sales, current ratio, and CCC. It is observed from table 7 that profitability ratios have an internal correlation among themselves but no correlation with the sales and working capital variables.

Table 8: One-way Anova between the logistic companies for selected variables

Variable	Source of Variation	SS	df	MS	F Stat	P-value
ROE	Between Groups	422.0566	5	84.41132	2.249079	0.062447
	Within Groups	2026.701	54	37.53151		
ROA	Between Groups	77.1172	5	15.42344	1.260798	0.294271
	Within Groups	660.5863	54	12.23308		
MV to BV	Between Groups	315.4926	5	63.09853	8.771334*	3.86E-06
	Within Groups	388.4609	54	7.193721		
CR	Between Groups	10.50341	5	2.100682	20.58481*	1.91E-11
	Within Groups	5.510705	54	0.10205		
CCC	Between Groups	15321.01	5	3064.203	17.80138*	2.18E-10
	Within Groups	9295.175	54	172.1329		
CA to TA	Between Groups	4.377127	5	0.875425	171.8841*	7.10E-32
	Within Groups	0.275028	54	0.005093		

(Source: Authors' calculations) * Significant at the 0.01 level.



Table 8 portrays the Anova result between six companies for six variables. It is examined from table 8 that the return on equity F value is less than the critical value and the p-value is greater than 0.05, so the null hypothesis is accepted at 5 percent level significance. It means that the return on equity between the six companies is not different from one company to another company. Return on assets F value is less than the critical value and p-value is greater than 0.05, here also null hypothesis accepted significance at 5 percent level. Market value to book value F value is higher than the critical value and the p-value is less than 0.01, so the null hypothesis is rejected and the alternative hypothesis accepted at 1 percent level significance. Even the current ratio, Cash conversion cycle, and current assets to total assets ratios F values are higher than critical values, and p values are less than 0.05. It is clear that for these three variables null hypothesis was rejected and the alternative hypothesis was accepted at a 1 percent level of significance.

It is understood that the profitability ratio (return on equity and return on assets) mean is equal between six logistic companies, which means that there is not much difference from one company to another company's profitability. The market value to book value mean of the six companies is not equal, it tells that MVBV is different from one company to another company. Even working capital variables mean also not equal between the six companies which means that each company maintains a different current ratio, having different cash conversion cycles and different current assets maintained in the total assets.

Table 9: Fixed-effects Panel data analysis, using 60 observations included 6 cross-sectional units and Time-series length is 10.

Dependent	Particulars	Coefficient	Std. Error	t-ratio	p-value	F Stat	R-Squared
ROE	Constant	-3.39782	24.2607	-0.1401	0.8892		
	CCC	-0.0706979	0.0725648	-0.9743	0.3346		
	CR	2.34757	2.5268	0.9291	0.3573	2.489108*	0.309411
	CATA	34.7738	11.6896	2.975	0.0045*		
	SIZE	0.0607554	3.07849	0.01974	0.9843		
ROA	Constant	-13.3641	11.9883	-1.115	0.2703		
	CCC	-0.0396712	0.0358573	-1.106	0.2739		
	CR	5.26424	1.2486	4.216	0.0001*	4.36966*	0.440258
	CATA	17.8155	5.77631	3.084	0.0033*		
	SIZE	1.13984	1.52121	0.7493	0.4572		
MV to BV	Constant	-3.04282	10.7785	-0.2823	0.7789		
	CCC	0.0744657	0.0322387	2.31	0.0251*		
	CR	-0.937157	1.1226	-0.8348	0.4078	6.161039*	0.525839
	CATA	-8.59983	5.19339	-1.656	0.104		
	SIZE	1.5855	1.3677	1.159	0.2519		

(Source: Authors' calculations) * Significant at the 0.05 level

Table 9 explains the working capital variables and size of the company's impact on profitability ratios and market value of the company by using fixed data panel data analysis for the six logistic companies. The dependent variable return on equity constant coefficient is negative with the independent variables but the constant is not significant at the 5 percent level. All independent variable's coefficients are positive with the ROE except the cash conversion cycle coefficient. Among all coefficients, only the current assets to total assets coefficient are significant at a 5 percent level and other independent variables coefficients are not significant. ROE Model F stat calculated value is higher than the critical value at the 5 percent level and independent variables explains the model with 30.94 percent. It can be interpreted that working capital variables significantly impact on return on equity of the logistic companies.

The dependent variable return on assets constant coefficient is highly negative with the independent variables but the constant is not significant at the 5 percent level. All independent variable's coefficients are positive with the ROA except the cash conversion cycle coefficient. Among all coefficients, the current ratio and current assets to total assets coefficient are significant at a 5 percent level and other independent variables coefficients are not significant. ROA Model F stat calculated value is higher than the critical value at the 5 percent level and independent variables explains the model with 44.02 percent. It can be interpreted that working capital variables significantly impact on return on assets of the logistic companies.



The market value to book value constant coefficient is negative with the independent variables but the constant is not significant at the 5 percent level. The current ratio and current assets to total assets variables coefficients are negative with the MVBV and cash conversion cycle coefficient and size variables coefficients are positive. Among all coefficients, only the cash conversion cycle coefficient is significant at a 5 percent level and other independent variables coefficients are not significant. MVBV Model F stat calculated value is higher than the critical value at the 5 percent level and independent variables explains the model with 52.58 percent. It can be interpreted that working capital variables significantly impact on market value to book value of the logistic companies.

CONCLUSION

Working capital management is an important part of a firm financial management decision. The ability of the firm to continuously operate for a longer period depends on how they deal with investment in working capital management. Optimal working capital management could be achieved by a firm that manages the tradeoff between profitability and liquidity. Management of working capital means “management of current assets and current liabilities, and financing these current assets”. If these firms properly manage their cash, accounts receivables, and inventories in a proper way, this will ultimately increase their profitability of these companies. It can therefore be expected that how working capital is managed will have a significant impact on the profitability of these firms. The objective of this study is to investigate the relationship between working capital management and firm profitability. The results of this study found that profitability variables are not having a significant correlation with the working capital variables. An important thing found from this research is that profitability mean is not different between all six companies but working capital variables means are different between the selected six logistics companies. The cash conversion cycle has a negative relationship with the profitability ratio and is not significant but other ratios like the current ratio and current assets to total assets ratios have a positive relation with profitability ratios. It is concluded that working capital has a negative effect on the profitability of logistics firms. There is much to be done about working capital in Indian logistic sectors in the future. Suggest that further research be conducted on the same topic with more samples and extending the years of the sample. The scope of further research may be extended to the working capital components management including cash, marketable securities, receivables, and inventory management.

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Cite this Article: Marisetty Nagendra, Shreelakshmi (2022). Impact of Working Capital Management on Profitability and Market value of the Logistics Industry. *International Journal of Current Science Research and Review*, 5(11), 4251-4263