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Review Article

Working capital management strategies and financial performance: A cause-and-effect analysis

Ashok Panigrahi[1]*

[1]*Dept. of Finance, NMIMS University, Shirpur, Maharashtra, India*

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ABSTRACT

This study attempts to validate whether the working capital management strategies can be considered as the causes of good or bad financial performance of an organization, particularly in Indian cement industry. Whether the decisions of finance managers of Indian cement companies concerning the components of working capital such as account receivables, inventory, accounts paybles, cash holding etc. affect the firm's performance individually and in total, a sample of 31 Indian cement companies listed on the Bombay Stock Exchange are being selected and their financial statements are analyzed for a period of 11-years (2010-2020). The findings of Pearson's correlation coefficient and random effect regression model analysis show that there exists a negative relationship between financial performance measured in terms of return on assets (ROA) and inventory turnover period (ITP) as well as accounts payable period (APP). In contrast, a firm's performance is not significantly affected by the accounts receivable period (ARP) and cash conversion cycle (CCC). Similarly, it has been observed that liquidity ratios such as current ratio (CR) and quick ratio (QR) have a significant positive association with ROA. Moreover, the size of the firms and leverage are inversely related to ROA but the age of the firms is not significantly affecting their financial performances.

1. Introduction

The ultimate aim of working capital management is to prevent either over investing or under investing in the current assets of a company since both have negative effects. Due to the cost of financing, excess investment in current assets may result in lower profitability due to unproductive use of funds and similarly under investment in current assets may pose a threat to the liquidity of the organization. Effective management of working capital is regarded as one of the most critical tasks for finance managers, as a significant portion of the money is tied up in current assets in actual practice. Smooth management of working capital is essential for any organization whether it is manufacturing, service, or retail for maintaining good financial health since it ensures a balance between the company's liquidity and profitability.[1–15] Managing working capital requires maintaining liquidity on a daily basis in business operations to ensure that regular financial commitments are met. Financial Managers face complex challenges in ensuring that the company operates in a well-organized manner by maintaining the required liquidity with desired profit as well. The disparity in current assets and current liabilities has a negative impact on a company's growth and competitive advantage especially in the case of industries where many big players exist in the market. Therefore, the importance of WCM in corporate finance cannot be underestimated due to its potential impact on the liquidity and profitability of the company. Having gone through a number of studies conducted on working capital management in Indian industries and a lot of interactions and deliberations with many finance managers managing

* *Corresponding author*.
E-mail address: panigrahi.ak@gmail.com (A. Panigrahi).

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working capital on a day-to-day basis, the researcher found that working capital management is one of the least used concepts for practical managerial decision-making. When we tried to find out these working capital issues in Indian industries, it was observed that the problem is more acute in the cement industry as, except a few, many small-sized companies are struggling with working capital problems. It was the basic reason that motivated the researcher to conduct a study on the Indian cement industry. Preliminary studies showed that many of the firms had inappropriate working capital management policies.[16–20] This resulted in several problems, both internal and external, that this research study uses as the main research background. Internally:

(a) Holding inappropriate levels of working capital – resulting in uncontrolled costs of holding the working capital items or deficient working capital levels.

(b) Inappropriately managing working capital - their purchases and sales activities have a defective credit policy.

To sum up, it was evident that the problems that the Indian cement companies face with respect to working capital management must be of one or more of the following types;

1. Difficult to manage day-to-day activities without sufficient working capital
2. Sometimes, the company may have to give up many market opportunities such as cash discounts and bulk lower prices on products, because of a lack of availability of ready working capital.
3. The company could lose out on its creditworthiness, as it will be unable to pay off its obligations when it matures.
4. Chances are that the company may lose excellent investment and expansion opportunities due to insufficient working capital.
5. It is observed that firms often struggle to focus on improving working capital because other priorities are competing for attention and each stakeholder is likely to have a different perspective on how to enhance working capital and their priorities.

2. Research Problem

Based on the above outcomes, we found three major research problems normally faced by the Indian cement industry. First of all, it is a fast-growing industry and a lot of small players are there who are not listed on the stock exchange creating intense competition. In such a situation, efficient management of working capital, and the adoption of effective working capital policy become more important to maintain profitability and market share. Secondly, the trend or practices of working capital policy in the small- and large-scale cement companies in the Bombay Stock Exchange were not clear because of the lack of research on this particular issue. Thus, it is high time to identify whether an aggressive or conservative working capital policy is suitable for small-size cement industries. Third, working capital management ratios, cash conversion cycle, etc. have been studied by many researchers while establishing a relationship between working capital management and profitability. However, in the case of the cement industries, the use of the determinants of working capital management is discrete by not providing any concrete outcome for the role of each proxy variable of working capital management in influencing firms' performance.

3. Review of Literature

Earlier studies on this topic have analysed the importance of working capital from a range of various viewpoints such as the importance of optimum inventory management, the best approach to managing accounts receivable in order to maximise profits etc. Although many studies were conducted on the relationship between working capital management and the financial performance of manufacturing industries in different countries, the research on the impact of working capital management on firms' profitability in the Indian context and that too on the cement industry, in particular, is very limited and hardly any study has extensively been carried out to analyse the importance of optimum utilization of working capital and its impact on a firm's profitability particularly with respect to Indian cement companies. The data collected from the previous studies on this area by various researchers are presented in the form of a table as given below which provides a concise view of the prior studies exclusively dealing with the relationship between the determinants of working capital and financial profitability in the cement industries.(Table 1)[21–30]

4. Research Methodology

4.1. Data and samples

The target population for this research is made up of all the Bombay Stock Exchange (BSE) listed cement manufacturing companies located in the Indian sub-continent. The sample cement companies were selected based on a few criteria. First of all, it has been ensured that the selected company should be a legal entity, filing their annual return to the register of companies, Govt. of India and should be listed in BSE. It has since been confirmed that the selected company should have 11 years of financial data starting from 2010 to 2020. Those companies not having the last 11 years of data were purposefully excluded from the sample. Thus, the sampling technique adopted in this research is purposive sampling. As the population is limited and countable, the study tried to include as many companies as possible provided they are satisfying the selection criteria. The final sample contains 31 cement companies with 11 years of financial data

Table 1: Summary ofprior studies on the relationship between working capital and performance in the cement industry

Author	Country	No of Companies	Financial year	CR	QR	ARP	APP	ITP	CCC	DV
Almazari (2014)	Saudi Arab	8	2008-2012					+		ROA
Angahar and Alematu (2014)	Nigeria	4	2002-2009			-		-	+	ROA
Dhar (2018),	Bangladesh	7	2007-2015			-	+	-	-	GPR
Hoque et al., (2015)	Bangladesh	6	2010-2012			-				NPR ROA
Kawakibi & Hadiwidjojo (2019)	Indonesia	6	2012-2017			-	-	+		ROA
Nwude et al., (2020)	Nigeria	3	2007-2018			+	-	-		ROA
Pandey and Sabamaithiy (2016)	India	24	2003-2013	+	+					ROI
Panigrahy, (2020)	India	30	2006-2015			+	-	-	-	ROA
Quayyum, (2011)	Bangladesh	6	2005-2009		+	+	+	-	-	NPR, ROA
Rehman and Anjum (2013)	India	10	2003-2008	-	-		+			ROA
Sarwat et al., (2017)	Pakistan	18	2007-2011	+						ROA
Shahzad et al., (2015)	Pakistan	7	2007-2013	+	-					ROA
Wanguu and Kipkirui (2015)	Kenya	3	2000-2014				-	+		ROA
Yasir et al., (2014)	Pakistan	16	2007-2012			-	-	-	-	ROA

Source: Author's Preparation

resulting in 341 Company-year panel data. The required data for study purposes were collected from the websites of moneycontrol.com and BSE.[31–39] All necessary required information for study purposes relating to the nature of the company, size, age, state and region, company background, value of total assets and annual financial statements of these companies for the period 2010 to 2020 have been obtained from this database.(Table 2)

5. Research Variables and Techniques

The entire study was conducted using generally accepted techniques of Descriptive Statistics Analysis. The selection and measurement of the dependent, independent and control variables were done according to some prior studies, which are presented in the (Table 3).

6. Empirical Analysis

Descriptive statistics of the variables included in the study have been presented in the (Table 4), The descriptive analysis includes information relating to the measures of central tendency including standard deviation, skewness, kurtosis, minimum and maximum values in the variables. The research analysis includes the dependent variable; ROA and other independent variables which measure the working capital management and liquidity position of the selected companies, and four control variables that are industry-specific and need to be controlled while verifying the impact of independent variables on the dependent variables. The other two variables include the year of establishment of the companies and the financial years for which data has been collected for the analysis. It found that the establishment year of selected cement companies lies between 1910 to 2001 with a mode of 1979 and, mean 1972. This indicates that most of the companies were established during the late 1900 century. Based on the financial year data, it is evident that the study included 11 years of data for the financial year starting from 2010 to 2020. The ROA of the cement companies shows a mean value of 0.051, a standard deviation of 0.079 which is slightly different from the average ROA of individual companies given in Table-IV. As such, the ROA of the companies ranges from -0.2 to 0.5.

Measurement of working capital ratios like; inventory turnover period (ITP) shows a mean value of 43.59 days with a standard deviation of 32.25 days. The ITP of the selected companies ranges from 0 to 238.25 days. Similarly, the Average Collection Period (ACP) shows a mean value of 40.47 days with a standard deviation of 69.95 days. ACP for selected companies ranges between 0 to 641.13 days. The Average Payments period (APP) shows a mean value of 35.69 days with a standard deviation of 43.77 days. ACP of the selected companies ranges from 0 to 664.22 days. Further, the mean Cash conversion cycle for selected companies is 48.37 days with a standard deviation of 75.27 days. The CCC ranges from -498.7 to 523.5 days and the majority of the companies have a negative cash conversion cycle because of a liberal accounts collection period. Similarly, the liquidity ratios i.e. the quick ratio (QR) show a mean value of 0.605 with a standard deviation of 0.565. QR of the selected companies ranges from 0 to 4.05 and the majority of the companies have a quick ratio of 0.40. The mean of the Current Ratio (CR) of the selected companies is given by 1.367 with a standard deviation of 0.919. Most of the firms have a current ratio of 0.68 with a median value of 1.14. The current ratio ranges between 0.07 to 6.54.

7. Correlation Coefficients Analysis

Pearson's correlation coefficient table which is given in the following table represents key information regarding the relationship between the dependent and independent variables. It is observed that the ROA is significantly negatively related to ITP, ARP and APP, however, the relationship of CCC is not significant. Moreover, leverage is also negatively related to ROA whereas, CR, QR, LCS, LCA and LOC are all positively related to ROA. In addition, multicollinearity issues have been found between measures of working capital such as CCC and ACP with a high correlation coefficient of 0.736. Hence, it was necessary to carry out Hausman's test to confirm the regression model and it is found that the random-effect model is more appropriate to use on the basis of results obtained from Hausman's test (Table 5).

8. Random Effect Regression Model

The random effect regression models given in (Table 6) explain the relationship between working capital components and financial performance i.e. ROA of all the selected companies. The value of the regression coefficient (β) for ITP, ARP and APP is -0.0004, -0.0004 and -0.0001 are statistically significant as per the random-effects model. Contrarily, CR is significantly more positively predicting the ROA of the selected companies.

9. Results and Discussion

The random-effects model shows that only ITP is significantly negatively related to the ROA of the sample companies at a 0.01 level of significance. Similarly, the APP is also negatively yet poorly affecting ROA at a 0.10 level of significance, but it has been found that the firm's profitability is not significantly affected by ARP and CCC. Also, it has been observed that the liquidity measures CR and QR have a significant positive association with ROA. Further, the size of the companies and leverage are inversely related to ROA but the age of the firms is not significantly affecting their financial performance.

Table 2: List of selected indian cement companies

Company code	Company Name	Establishment Year	State	Sector	Type
1. ACC	ACC Ltd.	1936	Maharashtra	Cement	Major
2. Ambuja	Ambuja Cements	1981	Gujarat	Cement	Major
3. APCL	Anjani Portland Cement ltd.	1983	Maharashtra	Cement	Mini
4. Birla	BIRLA CORPORATION LTD.	1910	West Bengal	Cement	Major
5. Burnpur	Burnpur Cement	1986	West Bengal	Cement	Major
6. BVCL	Barak Vally Cement Ltd.	1999	Assam	Cement	Major
7. Deccane	Deccan Cements	1979	Telangana	Cement	Mini
8. GSCL Cement	Gujarat Sidhee Cement Ltd.	1973	Gujarat	Cement	Major
9. Heidelberg	Heidelberg Cement	1954	Haryana	Cement	Major
10. Indiacem	India Cements	1946	Tamil Nadu	Cement	Major
11. JK Cement	J. K. Cement	1975	Uttar Pradesh	Cement	Major
12. JK Lakshmi	JK Lakshmi Cement	1938	Rajasthan	Cement	Major
13. Kakatcem	Kakatiya Cement	1979	Andhra Pradesh	Cement	Mini
14. KCP	KCP Ltd.	1941	Tamil Nadu	Cement	Major
15. Keerthi	Keerthi Ind	1982	Andhra Pradesh	Cement	Mini
16. KUL	Katwa Udyog Ltd	1993	Karnataka	Cement	Mini
17. Manglamcem	Mangalam Cement	1976	Rajasthan	Cement	Major
18. NCLIND	NCL Industries	1980	Telangana	cement	Mini
19. NIRAJ	Niraj Cement	1972	Maharashtra	Cement	Mini
20. PRSMJOHNSN	Prism Johnson Ltd	1992	Telangana	cement	Major
21. RAININD	Rain Industries Ltd.	1974	Telangana	Cement	Mini
22. RAMCO	Ramco Cements	1961	Tamil Nadu	cement	Major
23. SAGAR	Sagar Cement	1981	Telangana	cement	Mini
24. SAINIK	Sainik Finance & Industries Ltd	1991	New Delhi	Cement	Mini
25. SAURASHCEM	Saurashtra Cement	1956	Gujarat	Cement	Major
26. SCANPRO	Scan Projects Ltd	1992	Haryana	Cement	Mini
27. SHIVACEM	Shiva Cement	1985	Orissa	Cement	Mini
28. SHREDIGCEM	Shree Digvijay	1944	Gujarat	Cement	Major
29. SHREECEM	Shree Cements	1979	Rajasthan	Cement	Major
30. STARCEM	Star Cement	2001	Meghalaya	Cement	Major
31. ULTRATEC	UltraTech Cement	1983	Maharashtra	Cement	Major

Source: moneycontrol.com and BSE Website

Table 3: List of variables and estimation formulae

Variables	Definition	Estimation
Dependent Variables		
ROA	Return on Assets	EBIT/Average Assets
Independent Variables		
ITP	Inventory Turnover Period	(Inventory/COGS) x 365 Days
ARP	Accounts Receivables Period	(Accounts Receivable/Sales) x 365 Days
APP	Accounts Payable Period	(Accounts Payable/Purchases) x 365 Days
CCC	Cash Conversion Cycle	ITP+ ARP-APP
CR	Current Ratio or WCR	Current Asset/Current Liability
QR	Quick Ratio	Liquid Asset/Current Liability
Control Variables		
LCS	Firm Size	Log (Total Assets)
LCA	Firms Age	Log (Age in Years)
LEV	Leverage	Total Financial Debt / Total Assets
LOC	Location of the firm	1=East, 2= North, 3=West, 4=South

Source: Author's own creation

Table 4: Descriptive statistics of the variables

Variables	Mean	Median	Mode	SD	Skewness	Kurtosis	Min	Max
EST	1972	1979	1979	21.051	-1.06	0.593	1910	2001
FY	2015	2015	2010[a]	3.167	0.00	-1.22	2010	2020
ROA	0.051	0.04	0.02	0.079	1.340	7.289	-0.20	0.50
ITP	43.596	37.44	0.00	32.249	2.368	8.233	0.00	238.25
ACP	40.466	18.67	4.31[a]	69.958	4.226	22.871	0.00	641.13
APP	35.693	27.74	0.00	43.769	9.256	125.954	0.00	664.22
CCC	48.369	30.64	-0.99[a]	75.274	0.937	15.417	-498.69	523.54
CR	1.367	1.14	0.68[a]	0.919	2.289	7.462	0.07	6.54
QR	0.605	0.46	0.40	0.565	2.926	11.417	0.00	4.05
SG	0.142	0.070	0.040	0.690	10.300	137.378	-0.890	10.150
LCS	2.967	2.830	2.770[a]	0.829	-0.231	0.156	0.440	4.860
LCA	1.588	1.570	1.570	0.209	-0.040	-0.204	1.000	2.040
LEV	0.162	0.150	0.000	0.141	0.661	-0.167	0.000	0.610

Source: Interpretation of Secondary Data

Table 5: Correlation matrix of the variables

	ROA	ROE	ITP	ACP	APP	CCC	CR	QR	CAR	CLR	WTR	SG	LCS	LCA	LEV
ROA	1														
ROE	0.554**	1													
ITP	-0.248**	-0.168**	1												
ACP	-0.153**	-0.099	0.027	1											
APP	-0.183**	0.024	0.052	0.352**	1										
CCC	-0.141**	-0.178**	0.423**	0.736**	-.232**	1									
CR	0.205**	0.072	0.078	0.289**	-0.098	.359**	1								
QR	0.281**	0.093	0.434**	-0.138*	-.147**	.143**	.633**	1							
CAR	0.167**	0.102	-0.029	0.374**	.163**	.240**	.601**	.262**	1						
CLR	-0.269**	-0.038	0.088	0.007	.363**	-.166**	-.421**	-.364**	.195**	1					
WTR	0.058	0.014	-0.012	-0.022	-0.019	-0.014	0.013	0.032	0.019	-0.012	1				
SG	0.111*	0.145**	-0.131*	-0.085	.248**	-.279**	-0.058	-0.036	0.020	0.051	0.013	1			
LCS	0.093	0.012	-0.101	-0.337**	-.203**	-.239**	-.162**	-0.003	-.434**	-.354**	0.064	-0.072	1		
LCA	0.062	0.007	0.064	-0.146**	-0.054	-0.077	-0.094	-.128*	-.207**	-.186**	0.075	-0.099	.448**	1	
LEV	-0.204**	-0.075	-0.001	-0.071	-0.077	-0.021	-.235**	-.218**	-.443**	-.199**	-0.047	0.089	.157**	0.018	1

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

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

Table 6: Random effects regression model

Variable	β	**t**	β	**t**	β	**t**	β	**t**
C	0.0001	0.0025	-0.0150	-0.3700	-0.0170	-0.3480	-0.0040	-0.0710
ITP	-0.0004	(-4.7348) **						
ARP			-0.0004	(-5.0064) **				
APP					-0.0001	(-3.4174) **		
CCC							2.53E-05	1.4134
CR	0.0195	(3.0441) **	0.0419	(5.8525) **	0.0259	(3.9548) **	0.0263	(3.9510) **
QR	0.0308	(2.9433) **	-0.0082	-0.7396	0.0125	1.1826	0.0158	1.4778
LCS	0.0077	1.1430	0.0056	0.8664	0.0076	0.9989	0.0051	0.6552
LCA	-0.0101	-0.4205	-0.0053	-0.2328	-0.0077	-0.2826	-0.0192	-0.6880
LEV	-0.1232	(-5.2709) **	-0.1233	(-5.2844) **	-0.1238	(-5.1493) **	-0.1195	(-4.9397) **
LOC	0.0172	(3.4839) **	0.0169	(3.6408) **	0.0180	(3.2336) **	0.0183	(3.1688) **
R^2	0.1926		0.1974		0.1776		0.1626	
Adj. R^2	0.1803		0.1852		0.1650		0.1498	
F-statistic	15.6789		16.1634		14.1877		12.7558	
Prob(F-statistic)	0.0000		0.0000		0.0000		0.0000	
Durbin-Watson stat	1.3585		1.3712		1.3540		1.3543	
Correlated Random Effects - Hausman Test								
Chi-Sq. Statistic	71.4360		65.1916		58.7544		61.6432	
Chi-Sq. d.f.	6.0000		6.0000		6.0000		6.0000	
Prob.	0.0000		0.0000		0.0000		0.0000	

Note(s): Dependent Variable: ROA, Total panel (balanced) observations: 341
**. significant at 0.01, *. significant at 0.05, #. Significant at 0.10

10. Findings and Implications of the Study

Finally, the results of the research on working capital management and its impact on the financial performance of the BSE-listed cement companies reveal three important findings. First of all, working capital management, especially inventory management, and cash conversion cycle, negatively affects profitability whereas quick ratio and current ratio have a favourable impact on ROA. As such, the working capital turnover ratio was also found to be insignificant in explaining the financial performance of the selected companies. Moreover, the accounts collection period and accounts payable period exhibit a negative relationship with ROA but are not significant. Thus, instead of concentrating more on receivables and payables, cement companies should concentrate on reducing their inventory turnover period and cash conversion cycle on a priority basis. The outcomes of this study of the Indian cement manufacturing sector have been able to substantiate the existing theories and literature on the impact of working capital management on financial performance. These research findings highlight the importance of the inventory turnover period, cash conversion cycle theory, pecking order theory, and agency theory in evaluating the link between WCM and firm performance. The research also built a foundation for future research, allowing academicians to comprehend the connection between working capital management practices and financial performance. To some extent, the findings of the research help governments in their development strategies for enhancing the performance of this particular sector by infusing more liquidity and more infrastructural projects. Since the development of this particular industry is linked with infrastructure development and economic development, effective and favourable investment and developmental strategies need to be framed based on the dependency of profitability on WCM. Further, the data show that effective and efficient WCM especially, the inventory turnover period needs to be looked after for better financial results. Quicker inventory turnover will in turn reduce the cash conversion cycle, which in turn improves liquidity position and financial profitability.

This particular research is based on samples from the Indian cement manufacturing sector. Since business operations and management styles differ greatly across companies, firms as well as countries, the present study provides ample scope for extended research on firms in different economies after taking into account the degree of similarity among these businesses and the sample companies. Further studies might be conducted by categorizing businesses into different group-based company-specific characteristics and examining how these variables impact the relationship between WCM and firm performance. Further, working capital policies are influenced by internal management and control, competition, and technological advancements. Therefore, future studies may investigate the link between WCM and company performance by assessing market competitiveness, internal management control, and the degree of adoption of relevant technologies in the firm in consideration.

11. Conclusions

The study is designed to analyze working capital management practices and strategies followed in the Indian cement industry and their impact on the financial performance of the companies. In this process, the research analyzed various ratios pertaining to the working capital policy and practices in the selected companies and their impact on the performance to provide useful suggestions to improve the components of working capital for better performance. Its significance includes providing empirically-based guidance to businesses, especially cement industries, to improve their financial performance, including increased profitability only through adopting suitable working capital management strategies, relating to the maintenance of optimal levels of inventories, cash, and receivables.

The study's findings will assist the management of the selected companies by providing better insight into how they may successfully manage their working capital to improve their financial performance. The findings will also contribute to the existing body of knowledge by validating different theories of working capital management for the cement industry. The findings of this study may be beneficial to financial managers and investors in the Indian stock markets while making investment decisions. The study's findings will also aid policymakers and regulators in enacting new working capital management rules and regulations in the industrial sector. The study will also assist the investing community, including security analysts, investment managers, stockbrokers, and other institutional and retail investors, whose understanding of the link between working capital management and financial success is critical for investment analysis.

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This research received no external funding.

13. Conflicts of Interest

The authors declare no conflict of interest.

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Author biography

Ashok Panigrahi, Associate Professor https://orcid.org/0000-0002-0307-0544

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