

Article

Not peer-reviewed version

---

# Working Capital Management Strategies and Financial Performance: A Cause-and-Effect Analysis

---

[Ashok Panigrahi](#) \*

Posted Date: 29 December 2023

doi: 10.20944/preprints202312.2159.v1

Keywords: Working Capital Management; Financial Performance; Indian Cement Companies; Bombay Stock Exchange; Panel Data



Preprints.org is a free multidiscipline platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This is an open access article distributed under the Creative Commons Attribution License which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Article*

# Working Capital Management Strategies and Financial Performance: A Cause-and-Effect Analysis

Ashok Panigrahi

Associate Professor of Finance, Narsee Monjee Institute of Management Studies, NMIMS University, Shirpur, India; ashok.panigrahi@nmims.edu or panigrahi.ak@gmail.com; ORCID: <https://orcid.org/0000-0002-0307-0544>

**Abstract:** This study examines the effects of working capital management strategies on firm's financial performance of Indian cement companies using 11-year (2010-2020) financial data of 31 companies listed in Bombay Stock Exchange. It is intended to find out whether the strategies made by finance managers with respect to the components of working capital such as average receivable period, inventory conversion period, average payment period and cash conversion cycle, etc. affects the firm's performances individually and in total. The results of Pearson's correlation coefficient and random effect regression model shows 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), whereas firm's performance is not significantly affected by accounts receivable period (ARP) and cash conversion cycle (CCC). Similarly, it has been observed that the liquidity measures 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. Hence, it can be concluded that how an organisation designs its working capital strategy do have an impact on its performances.

**Keywords:** working capital management; financial performance; Indian cement companies; Bombay Stock Exchange; panel data

**JEL Classification:** G30; G32

---

## 1. Introduction

The ultimate aim of working capital management is to prevent either overinvesting or underinvesting 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 organisation. 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 (Azam, 2016). 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 (Prempeh and Peprah-Amankonah, 2019; Aktas et al., 2018). 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 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. The preliminary studies showed that many of the firms had inappropriate working capital management policies. 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 the 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 industry is facing with respect to working capital management may come across one or more of the following challenges:

1. Difficult to manage the 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 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 they are matured.
4. Chances are that the company may lose excellent investment and expansion opportunities due to insufficient working capital.
5. It is observed that firm's 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.

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 industries 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. Thirdly, 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.

## 2. 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, best approach to manage 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 yet the research on the impact of working capital management on firms' profitability in the Indian context and that too on 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. Considering all these variables and their impact and relationship with profitability, the following set of hypotheses have been developed for our study purpose:

1. There is no significant relationship between ITP and ROA.
2. There is no significant relationship between ARP and ROA.
3. There is no significant relationship between APP and ROA.
4. There is no significant relationship between CCC and ROA.
5. There is no significant relationship between CR and ROA.

**Table 1.** Summary of Prior 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.

### 3. Research Methodology

#### *Data and Sample*

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 industries as possible provided they are satisfying the selection criteria. The final sample contains 31 cement companies with 11 years of financial data resulting in 341 Company-year panel data. The required data for study purpose were collected from the websites of moneycontrol.com and BSE. All necessary required information for study purposes relating to nature of 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.** 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. GSCLCEMENT	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. JKCEMEN	J. K. Cement	1975	Uttar Pradesh	Cement	Major
12. JKLAKSHMI	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.

#### *Research Variables and Techniques:*

The entire study has been conducted by 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 is presented in the following table (Table 3).

**Table 3.** List of Variables and Estimation Formulae.

<b>Variables</b>	<b>Definition</b>	<b>Estimation</b>
<i>Dependent Variables</i>		
ROA	Return on Asset	EBIT/Average Assets
<i>Independent Variables</i>		
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
<i>Control Variables</i>		
LCS	Firms 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: Authors own creation.

#### *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. Besides, another two variables include the year of establishment of the companies and the financial years for which data has been collected for the analysis. It is found that the establishment year of the selected cement companies lies between 1910 to 2001 with a mode of 1979, mean 1972. This indicates that most of the companies are established during the late 1900 century. From the financial year data, it is evident that the study included 11 years of data for the financial years starting from 2010 to 2020. 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 4. As such, the ROA of the companies ranges between -0.2 to 0.5.

**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 <sup>a</sup>	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 <sup>a</sup>	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 <sup>a</sup>	75.274	0.937	15.417	-498.69	523.54
CR	1.367	1.14	0.68 <sup>a</sup>	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 <sup>a</sup>	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.

The measures 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. ITP of the selected companies ranges between 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 of the 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. APP of the selected companies ranges between 0 to 664.22 days. Further, the mean Cash conversion cycle of the selected companies is 48.37 days with a standard deviation of 75.27 days. The CCC ranges between -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 between 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.

#### *Correlation Coefficients:*

Pearson's correlation coefficient table which is given in the following table (Table 5) 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. Besides, multicollinearity issues have been found between the measures of working capital like CCC and ACP with a high correlation coefficient of 0.736. Hence, it was necessary to carry out the 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.** Correlation Matrix of the Variables.

	ROA	ROE	ITP	ACP	APP	CC C	CR	QR	CA R	CLR	WT R	SG	LC S	LC A	LE V
RO A	1														
RO E	0.554 **	1													
ITP	- 0.248 **	- 0.168 **	1												
AC P	- 0.153 **	- 0.099	0.027	1											
AP P	- 0.183 **	0.024	0.052	0.352 **	1										
CC C	- 0.141 **	- 0.178 **	0.423 **	0.736 **	- .232* *	1									
CR	0.205 **	0.072	0.078	0.289 **	- 0.09 8	.359* *	1								
QR	0.281 **	0.093	0.434 **	- 0.138 *	- .147* *	.143* *	.633* *	1							
CA R	0.167 **	0.102	- 0.029	0.374 **	.163* *	.240* *	.601* *	.262* *	1						



[illegible]

*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 ( $\beta$ ) 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 positively predicting the ROA of the selected companies.

**Table 6.** Random Effects Regression Model.

Variable	$\beta$	t	$\beta$	t	$\beta$	t	$\beta$	t
C	0.000 1	0.0025	- 0.015 0	-0.3700	- 0.017 0	-0.3480	-0.0040	-0.0710
ITP	- 0.000 4	(-4.7348)  **						
ARP			- 0.000 4	(-5.0064)  **				
APP					- 0.000 1	(-3.4174)  **		
CCC							2.53E- 05	1.4134

CR	0.019	(3.0441)	0.041	(5.8525)	0.025	(3.9548)	0.0263	(3.9510)
	5	**	9	**	9	**		**
QR	0.030	(2.9433)	-	-0.7396	0.012	1.1826	0.0158	1.4778
	8	**	0.008		5			
			2					
LCS	0.007	1.1430	0.005	0.8664	0.007	0.9989	0.0051	0.6552
	7		6		6			
LCA	-	-0.4205	-	-0.2328	-	-0.2826	-0.0192	-0.6880
	0.010		0.005		0.007			
	1		3		7			
LEV	-	(-5.2709)	-	(-5.2844)	-	(-5.1493)	-0.1195	(-4.9397)
	0.123	**	0.123	**	0.123	**		**
	2		3		8			
LOC	0.017	(3.4839)	0.016	(3.6408)	0.018	(3.2336)	0.0183	(3.1688)
	2	**	9	**	0	**		**
R <sup>2</sup>	0.192		0.197		0.177		0.1626	
	6		4		6			
Adj. R <sup>2</sup>	0.180		0.185		0.165		0.1498	
	3		2		0			
F-statistic	15.67		16.16		14.18		12.755	
	89		34		77		8	
Prob(F-statistic)	0.000		0.000		0.000		0.0000	
	0		0		0			
Durbin-Watson stat	1.358		1.371		1.354		1.3543	
	5		2		0			
Correlated Random Effects—Hausman Test								
Chi-Sq. Statistic	71.43		65.19		58.75		61.643	
	60		16		44		2	
Chi-Sq. d.f.	6.000		6.000		6.000		6.0000	
	0		0		0			
Prob.	0.000		0.000		0.000		0.0000	
	0		0		0			

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

#### 4. Results and Discussion

The random-effects model shows that only ITP is significantly negatively related to ROA of the sample companies at a 0.01 level of significance thus rejecting the null hypothesis H1. Similarly, APP is also negatively yet poorly affecting ROA at 0.10 level of significance which rejects the hypothesis H3. However, we fail to reject the hypotheses H2, and H4 as 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 by rejecting hypothesis H5. 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.

## 5. 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 and 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.

## 6. Conclusions

The study is designed to analyze working capital management practices and strategies followed in the Indian cement industry and its impact on 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.

**Author Contributions:** The whole paper is the author's own contribution.

**Funding:** This research received no external funding.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

1. Abuzayed, B. (2012), "Working capital management and firms' performance in emerging markets: the case of Jordan", *International Journal of Managerial Finance*, Vol. 8 No. 2, pp. 155-179. <https://doi.org/10.1108/17439131211216620>.
2. Akoto, R. K., Awunyo-Vitor, D., & Angmor, P. L. (2013). Work capital management and profitability: Evidence from Ghanaian listed manufacturing firms. *Journal of economics and international finance*, 5(9), 373-379.
3. Almazari, A. A. (2014). The relationship between working capital management and profitability: Evidence from Saudi cement companies. *Journal of Economics, Management and Trade*, 146-157.
4. ALShubiri, F. N. (2011). The effects of working capital practices on risk management: Evidence from Jordan. *Global Journal of business research*, 5(1), 39-54.
5. Angahar, P. A., & Alematu, A. (2014). Impact of working capital on the profitability of the Nigerian cement industry. *European journal of accounting auditing and Finance Research*, 2(7), 17-30.
6. Appuhami, B. R. (2008). The impact of firms' capital expenditure on working capital management: An empirical study across industries in Thailand. *International management review*, 4(1), 8.
7. Berk, J., Marzo, P.D., & Harford, J. (2009). *Fundamentals of corporate finance* (1st ed.). Boston: Pearson Education Inc.
8. Brigham, E. F., Gapenski, L. C., & Daves, P. R. (2004). *Intermediate financial management* (8th ed.). Ohio: Thomson South-Western.
9. Dash, M., & Hanuman, R. (2008). A liquidity-profitability trade-off model for working capital management [SSRN working paper series].
10. Deloof, M. (2003). Does working capital management affect profitability of Belgian firms? *Journal of business finance & Accounting*, 30(3-4), 573-588.
11. Dhar, S. (2018). Analysing the impact of working capital management on profitability: A study on DSE listed cement companies in Bangladesh. *Global Journal of Management and Business Research*. 26 (3), 3222-3235
12. Eljelly, A. M. (2004). Liquidity-profitability trade-off: An empirical investigation in an emerging market. *International journal of commerce and management*. Vol. 14 No. 2, pp. 48-61.
13. Filbeck, G., & Krueger, T. M. (2005). An analysis of working capital management results across industries. *American journal of business*. vol. 20 No. 2, pp. 11-20. <https://doi.org/10.1108/19355181200500007>
14. Garcia-Teruel, P.J., & Martinez-Solano, P. (2007). Effects of working capital management on SME profitability. *International Journal of Managerial Finance*, 3(2), 164.
15. Ghosh, S.K. and Maji, S.G. (2004), "Working capital management efficiency: a study on the Indian cement industry", *Management Accountant*, Vol. 3 No. 4, pp. 363-372.
16. Grablowsky, B. J. (1984). Financial Management of Inventory, *Journal of Small Business Management*, July, pp. 59-65
17. Hall, C. (2002). Total working capital management. *AFP Exchange*, 22(6), 26-32.
18. Haq, ul I., Sohail, M., Zaman, K., & Alam, Z. (2011). The relationship between working capital management and profitability: a case study of cement industry in Pakistan. *Mediterranean Journal of Social Sciences*, 2(2), 365-365.
19. Havoutis, N. (2003). *Optimising working capital: The latest solutions*. New York: JP Morgan
20. Hawawini, G., Viallet, C., & Vora, A. (1986). Industry influence on corporate working capital decisions.
21. Hoque, A., Mia, A., & Anwar, R. (2015). Working capital management and profitability: A study on cement industry in Bangladesh. *Research Journal of Finance and Accounting*, 6(7), 18-28.
22. Kabuye, F., Kato, J., Akugizibwe, I., & Bugambiro, N. (2019). Internal control systems, working capital management and financial performance of supermarkets. *Cogent Business & Management*. 6(1), 10.1080/23311975.2019.1573524
23. Kanga, O. S., & Achoki, G. (2017). Liquidity and financial performance in agricultural firms listed in the Nairobi securities exchange in Kenya. *International Journal of Business and Social Science*, 7(7), 57-65.

24. Kawakibi, A. A., & Hadiwidjojo, D. (2019). The effect of working capital management on company profits and values (study of cement companies listed on the Indonesia stock exchange). *International Journal of Business, Economics and Law*, 20(5), 30-37.
25. Khan, S.U., Hijazi, S.T., & Kamal, Y. (2005). Impact of working capital management on the profitability of firms: Case of listed Pakistani companies. Retrieved from SSRN.com (accessed on 7 April 2012).
26. Kimondo, C. N., Irungu, M., & Obanda, M. (2016). The impact of liquidity on the financial performance of the nonfinancial firms quoted on the Nairobi Securities Exchange. *Researchjournal's Journal of Accounting*, 4(2), 1-12.
27. Lazaridis, I., & Tryfonidis, D. (2006). Relationship between working capital management and profitability of listed companies in the Athens stock exchange. *Journal of financial management and analysis*, 19(1), 26-35.
28. Li, K., Musah, M., Kong, Y., Adjei Mensah, I., Antwi, S. K., Bawuah, J., ... & Andrew Osei, A. (2020). Liquidity and firms' financial performance nexus: panel evidence from non-financial firms listed on the Ghana Stock Exchange. *SAGE Open*, 10(3), 2158244020950363.
29. Matar, A., & Eneizan, B. M. (2018). Determinants of financial performance in the industrial firms: Evidence from Jordan. *Asian Journal of Agricultural Extension, Economics & Sociology*, 1-10.
30. Muhammad, H., Rehman, A. U., & Waqas, M. (2016). The relationship between working capital management and profitability: A case study of tobacco industry of Pakistan. *The Journal of Asian Finance, Economics, and Business*, 3(2), 13-20.
31. Nwankwo, O., & Osho, G. S. (2010). An empirical analysis of corporate survival and growth: Evidence from efficient working capital management. *International journal of scholarly academic intellectual diversity*, 12(1), 1-13.
32. Nwude, E. C., Allison, P. U., & Nwude, C. A. (2020). The relationship between working capital management and corporate returns of cement industry of emerging market. *International Journal of Finance & Economics*. 26(3), 3222-3235
33. Orshi, T. S. (2016). Impact of liquidity management on the financial performance of listed food and beverages companies in Nigeria. *Published Thesis, Federal University Dutsin-Ma*.
34. Owolabi, S. A., & Obida, S. S. (2012). Liquidity management and corporate profitability: Case study of selected manufacturing companies listed on the Nigerian stock exchange. *Business Management Dynamics*, 2(2), 10-25.
35. Padachi, K. (2006). Trends in working capital management and its impact on firms' performance: an analysis of Mauritian small manufacturing firms. *International Review of business research papers*, 2(2), 45-58.
36. Pandey, N. S., & Sabamaithily, S. (2016). Working capital management on profitability: Cement industry in India. *SCMS Journal of Indian Management*, 13(2), 81-95.
37. Panigrahi, C. M. A. (2020). Working Capital Management and Corporate Profitability: A Panel Data Regression Model Analysis of Indian Cement Companies. *Wutan Huatan Jisuan Jishu*, 16, 245-267.
38. Petersen, M. A., & Rajan, R. G. (1997). Trade credit: theories and evidence. *The review of financial studies*, 10(3), 661-691.
39. Prasad, P., Sivasankaran, N. and Shukla, A. (2019b). Impact of deviation from target working capital on firm profitability: evidence from India, *International Journal of Productivity and Performance Management*, Vol. 68 No. 8, pp. 1510-1527, doi: 10.1108/IJPPM-11-2018-0407.
40. Prasad, P., Sivasankaran, N., Paul, S., & Kannadhasan, M. (2019a). Measuring impact of working capital efficiency on financial performance of a firm: An alternative approach. *Journal of Indian Business Research*.
41. Quayyum ST (2011) Effects of working capital management and liquidity: evidence from the cement Industry of Bangladesh, *Journal of Business and Technology*, 6 (1), 37-47.
42. Rehman, M. U., & Anjum, N. (2013). Determination of the impact of working capital management on profitability: an empirical study from the cement sector in Pakistan. *Asian economic and financial review*, 3(3), 319.
43. Richards, V. D., & Laughlin, E. J. (1980). A cash conversion cycle approach to liquidity analysis. *Financial Management*, 32-38.
44. Ross, S.A., Westerfield, R.W., Jaffe, J., & Jordan, B.D. (2009). Modern financial management (8th ed.). New York: McGraw-Hill.
45. Saluja, P., & Kumar, P. (2012). Liquidity and profitability trade off. *International Journal of Advanced Research in Management and Social Sciences*, 1(3), 77-84.
46. Samiloglu, F., & Demirgunes, K. (2008). The effect of working capital management on firm profitability: Evidence from Turkey. *The International journal of applied Economics and Finance*, 2(1), 44-50.
47. Sarwat, S., Iqbal, D., Durrani, B. A., Shaikh, K. H., & Liaquat, F. (2017). Impact of working capital management on the profitability of firms: Case of Pakistan's cement sector. *Journal of Advanced Management Science*, 5(3).
48. Sawarni, K. S., Narayanasamy, S., & Ayyalusamy, K. (2020). Working capital management, firm performance and nature of business: An empirical evidence from India. *International Journal of Productivity and Performance Management*. 70 No. 1, pp. 179-200.

49. Shahzad, F., Fareed, Z., & Zulfiqar, B. (2015). Impact of working capital management on firm's profitability: A case study of cement industry of Pakistan. *European researcher. Series A*, (2), 86-93.
50. Sharma, A. K., & Kumar, S. (2011). Effect of working capital management on firm profitability: Empirical evidence from India. *Global business review*, 12(1), 159-173.
51. Shrivastava, A., Kumar, N. and Kumar, P. (2017), "Bayesian analysis of working capital management on corporate profitability: evidence from India", *Journal of Economic Studies*, Vol. 44 No. 4, pp. 568-584.
52. Ukaegbu, B. (2014). The significance of working capital management in determining firm profitability: Evidence from developing economies in Africa. *Research in International Business and Finance*, 31, 1-16.
53. Van Horne, J. C., & Wachowicz, J. M. (2004). *Fundamentals of Financial Management*, Prentice Hall Publishers, New York."
54. Vishnani, S., & Shah, B. K. (2007). Impact of working capital management policies on corporate performance—An empirical study. *Global business review*, 8(2), 267-281.
55. Wanguu, K. C., & Kipkirui, S. E. (2015). The effect of working capital management on profitability of cement manufacturing companies in Kenya. *IOSR Journal of Economics and Finance*, 6(6), 53-61.

**Disclaimer/Publisher's Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.