



**MEASURING THE IMPACT OF COMPONENTS OF WORKING CAPITAL ON
THE PERFORMANCE OF CEMENT INDUSTRY**

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Abstract

The study aims to examine the correlation between working capital components (ICP, ACP, APP and CCC) and the profitability (ROA) of the cement industry and to study the effect of each of the working capital components (ICP, ACP, APP and CCC) over the profitability (ROA) of the cement industry. Researcher has used last ten years' data of cement industry from 2007 to 2016. Data has been retrieved from the CMIE (Centre for monitoring Indian economy) software. Researcher has used correlation and multiple regression methods for the analysis of secondary data. It was found that the profitability of the cement industry which is represented by the variable return on asset is found to get negatively affected by the variables namely; cash conversion cycle and the average payment period. While the other two variables namely; average collection period and the inventory conversion period were found to have a significant positive effect on the profitability of the cement industry.

Keywords: Cash conversion cycle, Cement Industry, Return on Assets, Average inventory period, and Working capital management.

I. INTRODUCTION

India stands at second place in production of cement when compared with other countries in the world. Indian cement industry is the highest employment generating industry, which has generated around one million job opportunities in the country, both directly and indirectly. Deregulation of Indian cement industry in 1982, has attracted huge investments. Foreign investors have made a huge investment in Indian cement industry. Some of the major foreign players in Indian cement industry are; Lafarge-Holcim, Vicat and Heidelberg Cement. The growth rate of Indian cement industry has increased in recent past years due to the huge potential for growth and development in the infrastructure and construction sector of the Indian economy. Recent Government initiatives to develop 98 smart cities in the country has provided more growth opportunities to the Indian cement industry



Cement industry is an important component of the economic system which is linked with the growth of Indian economy. The role of cement industry in Indian economy is really divergent in nature. Infrastructure and real estate growth depends on the growth of cement industry. Cement is the basic element which is required for every development projects such as; building schools, roads, housing facilities, hotels, hospitals, temples or any construction in the country. Growth in the cement industry clearly indicates the growth of the economy. Infrastructure and real estate development signifies the development of the economy and it increases the demand for the cement industry. The growth of the other sectors also linked with the growth of the cement industry such as; growth of transportation (railways and roadways), and energy sector. The growth rate of infrastructural and real estate development of the country influences the demand and growth of the cement industry. Cement is most essential material for the industrial as well as for housing construction work. Cement is most preferred material for the construction of roads, ports, power plants etc. Cement is made up from aluminates and silicates of calcium. Cement is mainly a combination of silica, calcium & aluminium oxide, and iron oxide. Indian cement industry has shown a growth trend due to adoption of latest technology for the production of cement. Cement industry is an energy intensive sector, where coal is mostly used energy source to produce the cement. Third largest user of coal is cement industry in India, for cement production. Indian cement industry stands among the top producer of cement around the world, for using best and latest technology and best quality of limestone, which is found abundant in India. Indian cement industry produces a variety of cement such as; Portland Pozzolana, Ordinary Portland, Oil well, Sulphate Resisting, Portland blast furnace slag, Rapid hardening Portland and white cement. The cement industry strictly follows the standards specified by the Bureau of Indian Standards for the cement in order to maintain the quality of the cement. The Indian cement industry exports cement to around thirty countries across the globe and helps in increasing the foreign exchange reserves in the country. Indian cement industry has provided employment to approx. 0.1 million people in the country. Cement industry also contribute in the environmental protection by using the waste of thermal power plants and steel manufacturing units.

Indian economy is growing at a fast pace in comparison to the other developing economies of the world. The growth rate of Indian economy directly linked to the growth of infrastructure development in the country, which in turn leads to the growth of cement industries. Increased funding and investment in the infrastructure sector will lead to increase in the cement demand. In Union budget of 2015-16, the new government initiative such as; Low cost housing/affordable housing scheme, Swachh Bharat campaign, smart cities and Housing for all scheme, have increased the demand of cement by the real estate sector. The housing sector consumes 67 per cent of the total cement consumption in India. Thus the boost in the demand of housing sector, will directly affect the cement production in the country. Growing level of employment has led to growth of urbanization in the country which directly effects the increase in number of houses. Ultimately the demand of housing sector for the cement has increased. Government has started many initiatives to develop new houses in rural and semi urban areas



under various housing development schemes. Which has also boost the demand of cement by the housing sector. The new metro rail projects in Metro cities has boost the cement demand. Modernization project of airports and ports, dedicated freight corridor project, Atal Mission for rejuvenation & urban transformation, and metro rail expansion projects has increased the cement demand in the country. Cement is considered to be more durable and cheaper, therefore the government has decided to use cement instead of bitumen for the construction of roads in the country. This decision of government has boost the demand for the cement. Technology up gradation in the cement industry has helped in controlling cost of production through saving in energy, fuel and power. All these shows that there are huge opportunities available in the Indian cement industry. Thus, it is important to focus on the factors which have a significant influence on the performance of cement industry. Current study is an attempt in this direction.

II. REVIEW OF LITERATURE

Hassan et al. (2015), measured the impact of working capital management on the performance of non-financial firms of Pakistan. Researcher has used a sample of 48 non-financial firms listed on stock exchange of Karachi. The secondary data for the period of 2007 to 2011 was derived from the annual reports of the companies. Researchers have used panel data analysis technique using pooled ordinary least square method. Performance has been measured using three variables namely; return on assets, gross profit margin and return on equity while the working capital management has been measured using the period for inventory conversion, average collection and average payment to creditors. It was found from the study that inventory period has a positive relationship with the profitability of the non-financial firms of Pakistan, while Return on equity was found to be insignificantly related to the inventory period. Return on asset has a positive relation with the average collection period similarly; gross profit margin has a positive relation with the average collection period. Thus it can be said that the average collection period positively affects the performance of the companies. The relationship of average collection period and return on equity is found to be positive. Average payment period is negatively and insignificant relationship with the return on asset. Jingmeng (2013), conducted a study to explain working capital management system which can increase the performance of the companies. The system of Working capital management is based on the modifying cycle of working capital which includes total five elements namely; business environment, business goals, management mode, management policy and management performance. It was stated in the study that the management goals work as guidance for the whole management system in an organization. Atseye and Ugwu (2015) stated that working capital management policy of the company is one of the important policy of the business and it should be based on the internal and external environment of a business. Working capital management policy should match to the internal and external business environment. Efficient execution of working capital policy is also needed to get desired performance. The final goals of the business relays on the modifying cycle of working capital management. All the five elements play an important role in working capital management of a firm. Jindrichovska (2013), have studied the financial management and working capital management in Small and medium size companies. The study was based on



previous literature and highlighted the pattern of financial management in the small and medium sized companies and the challenges faced by the SMEs while managing their working capital. It was stated in the research that inefficiency in liquidity management can lead to the failures of small and medium size companies. Working capital management practices of SMEs directly affect the profitability of the companies. The profitability of the SMEs can be increased by shortening the length of cash conversion period and by reducing the inventory conversion period and accounts receivables period. Sharma & Kaur (2016) stated in the research that the profitability of the companies can be maximized when the working capital of the company achieve at its optimum level. It was also mentioned that the profitability of the companies gets reduced if the companies move away from their optimum level of working capital. Hoque Jahirhul (2013) found that working capital management policies have a great impact over the financial performance of the manufacturing firms of Bangladesh. Further it was revealed from the primary data analysis that cash conversion cycle and inventory turnover period are the main factors which affects the short term financial policies of the studied firms. Maintaining reasonable amount of cash is the most important financial objective of all the firms while cash management policy is the most important short term financial policy of all the manufacturing firm studied by the researcher. Adeleke and Mukolu (2013), conducted a study on Nigeria companies using ordinary least square method for data analysis, where the return on capital employed have been taken as a proxy variable for the performance of the organization while working capital, turnover of the companies and equity have been taken as independent variables. No significant relationship has been found between working capital and organizational performance for the review period. Kaur (2015) and Adagye (2015) stated that working capital do not play a significant role in the performance of organizations. It was also stated by the researchers that companies who follow the conservative policy of working capital are likely to perform poor than companies who do not follow conservative working capital policy. Mansoori and Muhammad (2012), have conducted a study to measure the working capital performance of the Singapore companies. Researchers have used both the endogenous (firm specific factors such as; market share, firm size, profitability, and operating risk) and exogenous factors (macroeconomic factors such as; tax rate, interest rates and GDP) in the study. It was found during the study that firm size, capital expenditure, operating cash flow and gross domestic products are negatively related to the working capital performance of the companies. Mousavi and Jari (2012) have conducted a study on companies of Iran using net liquidity balance as independent variable while return on assets, price to book value and return on equity have been taken as dependent variables which are used as proxy variables for measuring the performance of the firms. It was found from the study that return on assets, price to book value and return on equity have positive and significant relationship with working capital of the company. Working capital effects, the price to book value ratio, return on assets and return on equity significantly. Mumtaz et al. (2012) conducted a study on chemical companies of Pakistan. Working capital management has been measured using various variables namely; inventory turnover period, number of days' receivables while the control variables used in the study were firm's Size, Inventories, Leverage, Equity, Gross Domestic



Product, and Sales. Return on Asset has been used as the dependent variable for the measurement of the performance of the chemical firms. The firm size has been found positively related to the firm's profitability. The firms with higher profits does not show interest in managing working capital. Mathur et al., (2014) found from the study that the profitability of the firm increased or decreased along with its increase or decrease in the size. Moreover, negative relationship has been found between the profitability and the debt ratio of the chemical firms. The study highlights the fact that the firms which are able to meet their short term liabilities and out flows shows higher profitability.

III. OBJECTIVES

1. To examine the correlation between working capital components (ICP, ACP, APP and CCC) and the profitability (ROA) of the cement industry.
2. To study the effect of each of the working capital components (ICP, ACP, APP and CCC) over the profitability (ROA) of the cement industry.

IV. RESEARCH METHODOLOGY

Researcher has used last ten years' data of cement industry from 2007 to 2016. Data has been retrieved from the CMIE (Centre for monitoring Indian economy) software. Following are the variables which have been used in the study:

Average Collection Period: Average collection period shows the time period in which the debtors of the company are paying for the credit sales. The lower period shows the efficiency of the debt collection policy of the firm. The low average collection period indicates the high level of efficiency of the cement companies in utilizing its resources.

$$\text{Average Collection Period} = 365 * \text{Average Debtors} / \text{Credit Sales}$$

Average Payment Period: It indicates the time period in which the cement companies make payment of its debt to the suppliers or vendors for making credit purchases. The lower average collection period shows that the creditors are being paid off rapidly and increases the credibility of the company. It also shows the sound liquidity position of the company.

$$\text{Average Payment Period} = 365 * \text{Average Creditors} / \text{Credit Purchases}$$

Inventory Conversion Period: It indicates the period taken by the stock to convert into finished goods. It includes the process of converting raw material into work in process and then work in process into finished goods and finished goods into cash or credit sales through debtors or bill receivables.

Cash conversion Cycle: It indicates the period taken by cash to convert again into cash by going through the various stages namely; cash, raw material, work in process, finished stock,



sales/debtors and cash. It is the total time taken by a working capital cycle. The higher period of cash conversion indicates the lower efficiency of the cement companies in utilizing the funds.

Correlation analysis: Correlation analysis has been used in the current study to measure the correlation among the variables namely; ICP, CCC, ROA, ACP, and APP. The value of correlation coefficient shows the degree of connotation such as; high, low or moderate degree of correlation among the variables. Sign of correlation coefficient express the positive or negative direction of relationship among the variables. Positive sign of correlation coefficient indicates that all the variables will go up and down in same direction while negative correlation coefficient shows that the variables move in the opposite directions.

Multiple regression analysis: The current study is a longitudinal study as the data of last ten years has been used in the study for the purpose of analysis. Multiple regression analysis is used in the current study to study the effect of each of the working capital components (ICP, ACP, APP and CCC) over the profitability (ROA) of the cement industry. The regression model which was used to examine the relationship between working capital components and profitability of the cement industry, has been given below:

$$\text{Regression Model: ROA} = \beta_0 + \beta_1\text{ACP} + \beta_2\text{ICP} + \beta_3\text{APP} + \beta_4\text{CCC} + \xi$$

Where; β_0 , to β_4 are the value of regression coefficients for each of the independent variables, ξ denotes the error term or standard error in regression model.

Dependent Variable: ROA denotes the profitability of the cement industry which is also known as Return on Asset. Here in this model, it has been used as a dependent variable. ROA has been calculated in the current study using the following formula:

Return on Assets (ROA) for Cement Industry = Total profits of cement industry before payment of Tax and Interest charges / Total Assets hold by all the cement industries of India.

Independent Variables: The following are the independent variables used in the current study:

- ACP (Average collection Period in Indian Cement Industry) = (Average debtors plus bills receivables / Net Sales) * number of working days in a year i.e. 365
- ICP (Inventory Conversion Period in Indian Cement Industry) = (Average stock/Inventory/ total cost of Sales) * number of working days in a year i.e. 365
- APP (Average Payment Period in Indian Cement Industry) = (Average creditors plus bills payable / Total cost of Sales) * number of working days in a year i.e. 365
- CCC (Cash Conversion Cycle in Indian Cement Industry) = Average collection Period in Indian Cement Industry + Inventory Conversion Period in Indian Cement Industry - Average Payment Period in Indian Cement Industry.



Researcher has proved the following hypothesis in the study:

H₀₁: Working capital has no significant impact on the profitability of the cement industry.

V. ANALYSIS AND FINDINGS

This section deals with the analysis of secondary data related to the working capital and profitability of the Indian cement companies for last ten years from 2007 to 2016. Analysis has been divided into three parts. First part of data analysis shows the descriptive statistics for each of the five variable used in the study. Second part includes the correlation analysis of all the five variable used in the study namely; ACP (Average collection Period in Indian Cement Industry), ICP (Inventory Conversion Period in Indian Cement Industry), APP (Average Payment Period in Indian Cement Industry), CCC (Cash Conversion Cycle in Indian Cement Industry and Return on assets of the Indian cement industry. Third part of the data analysis depicts the results of the regression analysis used to identify the cause and effect relationship between ROA and working capital components of cement industry.

Table 1: Results of Descriptive Analysis

	ROA	CCC	ICP	ACP	APP
Mean Value	0.92	96.44	124.34	62.34	89.32
Standard Deviation	2.01	16.64	6.45	9.97	12.34
Minimum value	-2.03	72	119	52	74
Maximum Value	4.80	138	149	83	119
Data Source: CMIE (Prowess)					

Interpretation: It can be interpreted from the results of the descriptive analysis that the mean value of ROA in Indian cement industry is 0.92, with a standard deviation of 2.01, while the maximum value of ROA is recorded 4.80 in Indian cement industry during last ten years and the minimum value of ROA is -2.03. The average period of cash conversion cycle was 96 days in Indian cement industry, with a standard deviation of 16.64, while the maximum time period for cash conversion in cement industry was recorded 138 days in last ten years and the minimum time period for cash conversion in cement industry was recorded 72 days. The average period of inventory conversion was 124 days in Indian cement industry, with a standard deviation of 6.45, while the maximum time period for inventory conversion in cement industry was recorded 149 days in last ten years and the minimum time period for inventory conversion in



cement industry was recorded 119 days. The average period of collection from debtors was 62 days in Indian cement industry, with a standard deviation of 9.97, while the maximum time period for collection from debtors in cement industry was recorded 83 days in last ten years and the minimum time period for collection from debtors in cement industry was recorded 52 days. The average period of payment to creditors was 89 days in Indian cement industry, with a standard deviation of 12.34, while the maximum time period for payment to creditors in cement industry was recorded 119 days in last ten years and the minimum time period for payment to creditors in cement industry was recorded 74 days.

Table 2: Results of Correlation

	ROA	APP	ICP	CCC	ACP
ROA	1				
APP	0.046	1			
ICP	-0.257	0.018	1		
CCC	0.236	-0.802**	0.387	1	
ACP	0.039	0.052	-0.049	0.298	1
** one percent significance level					
Data Source: CMIE (Prowess)					

Interpretation: It can be interpreted from the results of correlation analysis that ROA has a positive relationship with the APP, CCC and ACP, while it has negative relation with the ICP. But none of the correlation was found significant except the one which is correlation between APP and CCC. Thus, it can be said that cash conversion cycle period has an adverse relationship with the average payment period and this relationship is found to be significant.

Table 3: Results of Multiple Regression

Regression Model (Dependent Variable: ROA (Profitability of Cement Industry))	Coefficients (Unstandardized)		Coefficients (Standardized)	t-test value	p- value
	B	S.E.	Beta Value		
Constant	13.432	8.432		1.433	0.075



Average collection Period in Indian Cement Industry	0.442	0.187	1.112	5.563	0.003
Inventory Conversion Period in Indian Cement Industry	0.354	0.195	1.432	3.223	0.046
Average Payment Period in Indian Cement Industry	-0.588	0.148	-3.243	-4.564	0.016
Cash Conversion Cycle in Indian Cement Industry	-0.498	0.186	-3.213	-3.234	0.022
Value of R = 0.790 R ² = 0.624 F-value = 5.342 P-value = 0.002					
Data Source: CMIE (Prowess)					

Interpretation: It can be interpreted from the results of the regression analysis that the value of R is 0.790, and the value of R square is 0.624, which shows the degree of determination. It indicates that 62 percent variation in the value of profitability is caused by the four components of the working capital in cement industry. While the factors other than working capital components are responsible for rest of the 38 percent variation in the value of profitability. Further, the value of 'F' is found to be 5.432 which is significant at 99 percent confidence level, thus it can be said that the null hypothesis is false which states that there is no significant relationship between profitability of the cement industry and the components of working capital.

In addition to the above, the values of regression coefficients, shows that two variables out of four variables have found to have a negative relation with the profitability of the cement industry which is represented by the ROA. These variables are namely; cash conversion cycle and the average collection payment period. Both these variables were found to have a significant relation with the profitability of the cement industry. The regression coefficient for inventory conversion period is found to be 0.354, and the t-value of inventory conversion period is found to be 3.223 with a p-value of 0.046, which indicates that profitability of the cement industry is positively and significantly affected by the inventory conversion period. Similarly; the regression coefficient for average collection period is found to be 0.442, and the t-value of average collection period is found to be 5.563 with a p-value of 0.003, which indicates that profitability of the cement industry is positively and significantly affected by the average collection period. The values of regression coefficients for all the four variables are below or equal to 0.50 which shows that the degree of relationship between profitability and the four



components of the working capital in cement industry is moderate, i.e. now very high or too low.

VI. CONCLUSION

It can be concluded from the study that the profitability of the cement industry which is represented by the variable return on asset is found to get negatively affected by the variables namely; cash conversion cycle and the average payment period. While the other two variables namely; average collection period and the inventory conversion period were found to have a significant positive effect on the profitability of the cement industry. Thus, overall the profitability of the cement industry gets significantly affected by the management practices towards the working capital of the cement industry. Study depicts that the managers can maximize the wealth of their shareholders by increasing the payment period to the suppliers or vendors and by reducing the period of collection from the debtors or bill receivables. The speedy conversion of inventory into finished goods can help in overall operating cycle of the business, and the cash conversion cycle. Thus, managers should focus on receivables management and inventory management in the cement industry to increase the profitability of the cement industry.

VII. LIMITATIONS AND FUTURE SCOPE

Current study is limited to one industry i.e. Indian cement industry. Relationship between profitability and the various components of the working capital can also be done for other industries. Cross comparison of the various industries can also be done for studying the practices followed by various industries related to working capital management. Study is based on the secondary data only; primary data can also be done to study the practices of working capital management in the cement industry in detail.

REFERENCES

- [1] Adageye D. (2015). Effective Working Capital Management and the Profitability of Quoted Banks in Nigeria. *European Journal Of Accounting Auditing And Finance Research*, 3 (2), 97-107.
- [2] Adeleke Omolade and Mukolu. M.O (2013). Working Capital and Organization Performance in Nigeria. *International Journal of Business and Management Invention*, 2 (6), 26-35.
- [3] Atseye, A. and Ugwu, J. (2015). Determinants of Working Capital Management Theoretical Review. *International Journal of Economics, Commerce and Management*, III (2), 1-11.
- [4] Hassan N., Imran M. And Amjad M. (2014). Effects of Working Capital Management on Firm Performance: An Empirical Study of Non-Financial Listed Firms in Pakistan.



- International Journal of Academic Research in Business and Social Sciences, 4 (6), 114-132.
- [5] Hoque, J. (2013). Impact of Working Capital Policies on Financial Performances in Some Selected Private Manufacturing Firms in Bangladesh. Proceedings of 9th Asian Business Research Conference 20-21 December, 2013, BIAM Foundation, Dhaka, Bangladesh
- [6] Jindrichovska Irena (2013). Financial Management in SMEs. European Research Studies, XVI, Special Issue on SMEs, 79-96.
- [7] Jingmeng, Mao (2013). A Study on Working Capital Management System Based On Performance. International Journal of Innovation, Management and Technology, 4 (1), 100-103.
- [8] Kaur, Vineet (2015). Efficient Management of Working Capital: A Study of Healthcare Sector in India. Journal of Economics and International Finance, 5 (9), 373-379.
- [9] Mathur, S.P., Swarnkar R. & Soni Yogesh (2014). Working Capital Management of Rajasthan Cooperative Dairy Federation Ltd. In India. International Journal of Technology Enhancements and Emerging Engineering Research, 2 (10), 81-86.
- [10] Mousavi Z. and Jari A. (2012). The Relationship between Working Capital Management and Firm Performance: Evidence from Iran. International Journal of Humanities and Social Science, 2 (2), 141-146.
- [11] Muhammad, A. And Syed, I (2012). Impact of Working Capital Management on Firms' Performance: Evidence from Non-Financial Institutions of KSE-30 Index. Interdisciplinary Journal of Contemporary Research in Business, 3(5), 1-13.
- [12] Mumtaz, A. Rehan, M., Rizwan, M., Murtaza, F., Jahanger, A., Khan, H.A. (2012). Impact of Working Capital Management on Firms' Performance: Evidence from Chemical Sector Listed Firms in KSE-100 Index, IOSR Journal of Business and Management, 93-100.
- [13] Sharma P. And Kaur R. (2016). Working Capital Management and Its Impact on Profitability: A Case Study of Bharti Airtel Telecom Company. Imperial Journal of Interdisciplinary Research, 2 (3), 265-271.