DETERMINANTS OF WORKING CAPITAL OF THE LEADING CEMENT COMPANIES IN INDIA (WITH REFERENCE TO AMBUJACEMENTS LTD. AND UTRECHT CEMENTS LTD.)

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Abstract
India is the second largest producer of cement in the world. India's cement industry is a vital part of its economy, providing employment to more than a million people, directly or indirectly. It is consented to be a core sector accounting for approximately 1.3% of GDP. Also the industry is a significant contributor to the revenue collected by both the central and state governments through excise and sales taxes. The Ambuja Cements Ltd (ACL) and Ultratech Cements Ltd (UCL) is among the top most leading cement companies in the industry. Their contribution to the central and state governments in the form of Taxes and to distribute reasonable return to the shareholders are considered as an important task of the selected cement companies. In this aspect, the determinants of working capital are the items that have a direct impact on the amount invested in current assets and current liabilities. Since working capital can absorb a large part of the funding in the cement industry, it is obligatory to the management to keep a close watch over these factors. Accordingly, a study has been undertaken to analyze the determinants of working capital of these two selected cement companies viz. ACL and UCL In this study, the GWCTR and NWCTR are selected as dependent variables whereas CR, LR, DTR, ITR and size in terms of sales have been reserved as the independent variables for the regression analysis under the study.

Key Words: Gross Working Capital, Networking Capital, Current Ratio, Inventory Turnover Ratio and Debtors Turnover Ratio.

Introduction
The requirements of working capital are not uniform in all enterprises, and therefore, factors responsible for a particular size of working capital in one company are different than in other enterprise. Therefore, a set pattern of factors determining the optimum size of working capital is difficult to suggest. Management of working capital in a given enterprise has profitability and liquidity implications. Working capital represented by current assets, constitutes a dominant and controllable segment of investment, particularly in manufacturing enterprises and efforts to prune it or optimize its size must promptly enhance the profitability. Importance of working capital can further be judged from the fact that many a time the main cause of the failure of a business enterprise has been found to be the shortage of current assets and their mishandling. Inadequate working capital is a serious handicap in the business. In India, since independence, great emphasis has been laid on the development of cement industry. Cement industry is one of the key industries in India. It plays a dominant role in the national economy from the point of view of economic development of the country. Keeping in mind the above importance of the cement industry in the economic development, a study on determinants of working of capital of the leading cement companies especially Ambuja Cements Ltd. and Ultra tech Cements Ltd is carried out.

Concepts of Working Capital
In an ordinary sense, working capital denotes the amount of funds needed for meeting day-to-day operations of a concern. This is related to short-term assets and short-term sources of financing. Hence it deals with both, assets and liabilities in the sense of managing working capital it is the excess of current assets over current liabilities. In general, the concepts of working capital can be classified as gross working capital and Net working capital. The concept of gross working capital refers to the total value of current assets. In other words, gross working capital is the total amount available for financing of current assets.

The net working capital is an accounting concept which represents the excess of current assets over current liabilities. Net Working Capital refers to the difference between current assets and current liabilities. Current liabilities are those claims of outsiders which are expected to mature for payment within an accounting year and include creditors (accounts payable), bills payable, and outstanding expenses (Pandey, 2000)[1]. Net working capital can be negative or positive. Net working capital Current assets consist of items such as cash, bank balance, stock, debtors, bills receivables, etc. and current liabilities include items such as bills payables, creditors, etc. Excess of current assets over current liabilities, thus, indicates the liquid position of an enterprise. Working capital is also called circulating capital or revolving capital or short-term capital. Working capital is used for regular business activities like for the purchase of raw materials, for the payment of wages, payment of rent and of

other expenses. Working capital is kept in the form of cash, debtors, raw materials inventory, stock of finished goods, bills receivable etc.

Review of Literature
The researcher examined some research works carried out in India and few works done in abroad and the tips from these research works have been taken to channelize in the proper perspective. The substances of some of the relevant research studies and research papers on working capital management are presented as follows.

Padachi (2006)[2]emphasized that the management of working capital is important to the financial health of businesses of all sizes. This importance is hinged on many reasons. First, the amounts invested in working capital are often high in proportion to total assets employed and so it is vital that these amounts are used in an efficient way. Second, the management of working capital directly affects the liquidity and the profitability of the corporate firm and consequently its net worth.

Hill, Kelly, &High field (2010)[3] tried to determine the more important factors, which affect working capital management in US corporations. Their finding disclosed that Working Capital Requirement (WCR) positively related to the operating cash flow, and negatively correlated to the financial distress and market to book ratios. They found no evidence for relationship between gross margin profit, market share, and WCR.

Zariyawati et al. (2010)[4] investigated important factors, which affect working capital management in Malaysian firms. Panel data analyzes including pooled OLS regression was applied, and the results compared to fixed effect and random effect models for robustness tests. Their results showed that firm size, debt ratio, and sales growth have a negative relationship with the CCC. In addition, their findings revealed that firms with more debts have less working capital since the cost of external financing is higher for these firms. Moreover, a negative relationship between CCC and sales growth indicated that corporations use short-term financing to supply future demands. The positive relationship between economic growth and working capital indicated that firms expanded their investment on working capital during the economic boom. Finally, they found no evidence for the impact of corporate governance variables on working capital management.

Objectives of the Study
The main objectives of the study are
1. To examine the determinants of Gross working capital of the selected cement companies
2. To examine the determinants of Net working capital of the s4elected cement companies.

Research Methodology
Data and sample selection
Among the Top twenty cement companies in India, the ACL and UCL have been selected on the basis of their year of establishment. These two companies were started in 1986. They have completed over 30 years of operations. Hence it is considered to compare their working capital management since last seven year i.e. from 2010-11 to 2016-17.The secondary Data for the study have been collected from CMIE, New Delhi and Money control .com.

Measurement of Variables
Keeping the gross and net concepts of working capital in mind, the following variables on the 'a priori' ground are identified as determinants of working capital in the present study. In this regard, CR, LR, ITR, DTR and Size have been used as independent variables. On the other hand, Gross Working Capital Turnover Ratio (GWCTR) and Net Working Capital Turnover Ratio (NWCTR) are taken as dependent variables alternatively. The measurement of these variables is presented as follows.

1. **Current Ratio (CR):** The current ratio is a financial ratio that shows the proportion of current assets to current liabilities. The current ratio is used as an indicator of a company's liquidity.
2. **Liquid Ratio (LR):** The liquidity ratio is used to measure a company's ability to pay its short-term debts. This ratio is: computed by dividing liquid assets by current liabilities.

3. **Inventory Turnover Ratio (ITR):** Inventory turnover Ratio is used to measure of how efficiently a company can control its products, so it is important to have a high turn. The inventory turnover ratio is calculated by dividing the Net sales by Inventory for the period.

4. **Debtors Turnover Ratio (DTR):** The Debtors Turnover Ratio is an accounting measure used to measure a firm's effectiveness in extending credit and in collecting debts on that credit. This ratio is an activity ratio measuring how efficiently a firm uses its assets. It can be calculated by dividing the net value of sales during a given period by the value of Debtors during the same period.

5. **Size (Net Sales):** Size is here expressed as Net Sales.

Specification of Variables

1. The coefficient of CR and LR are expected to be positive. It implies that the increase in Liquidity ratios would increase the GWCTR/NWCTR and vice versa.
2. The coefficient of turnover ratios such as ITR and DTR are expected to be positive. It implies that the increase in turnover ratios would increase the GWCTR/NWCTR and vice versa.
3. The coefficient of size in terms of sales is expected to be positive. It implies that the increase in size would increase the GWCTR/NWCTR and vice versa.

Results and Discussion
(i) Regression Models for GWCTR
The Regression Models for GWCTR have been framed by using five independent variables viz., CR, LR, ITR, DTR and Size. Two models are framed by changing and deleting these five independent variables one by one

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

Y - Gross Working Capital Turnover Ratio (GWCTR)
X_1- Current Ratio (CR)
X_2- Liquid Ratio (LR)
X_3- Inventory Turnover Ratio (ITR)
X_4- Debtors Turnover Ratio (DTR)
X_5- Size

$b_1, b_2, b_3, b_4, b_5,$ - Regression co-efficient of the independent variables, a - Intercept

Model – 1
The GWCTR Model -1 has been constructed by using five variables viz.,, CR, LR, ITR, DTR, and SIZE as under.
GWCTR = a + b_1 CR + b_2 LR+ b_3ITR + b_4DTR + b_5SIZE

The estimated regression results of the GWCTR Model -1 for the selected cement companies during the period 2010/11 – 2016/17 are presented in Table 6.1.

It is perceived from the Table that the estimated working capital function is good under GWCTR in ACL and UCL since the explanatory power of the equation measured by R^2 and F appear to be good. The value of R^2 varies from 0.78to 0.75. That is about 75 % to 78 % of the variations in GWCTR of the selected cement companies are explained by the variables in that equation. The regression as a whole is highly significant at 1 per cent level in both the firms under study.

Table 1 Gross Working Capital Turnover Ratio – Model 1 (2010-11 to 2016-17)
GWCTR = a + b_1 CR + b_2 ITR + b_3 DTR + b_4 SIZE

	Company	Constant	Co – efficient of					R^2	F Ratio	D.W
GWCTR			CR (b_1)	LR (b_2)	ITR (b_3)	DTR (b_4)	SIZE (b_5)			

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| | ACL | -4.887 (.128) | 22.465 (.028)** | -22.648 (.028)** | 13.711 (.046)** | -3.776 (.165) | -7.870 (.080) | .782 | 74.389 | 2.460 |
| | UCL | -4.694 (.134) | 117.698 (.005) | -121.88 (.005)* | 15.907 (.040)** | 11.814 (.054) | 29.624 (.021)** | .751 | 38.117 | 2.835 |

Note: Figures in parenthesis are computed 'p' value
Significant Level: * 1 Percent, ** 5 Percent,
Source: Centre for Monitoring Indian Economy (CMIE), New Delhi, India.

It is clear from Table 6.1 that the coefficient of CR and ITR in ACL and ITR and Size in UCL is known to be positive under the measures of GWCTR in these two companies and these are statistically significant at 5% level under study. It implies that CR and ITR in ACL and ITR and SIZE in UCLimpactthe GWCTR. Hence the hypothesis that GWCTR is an increasing function of above variables is proved under this study. But the co efficient of LR both in ACL and UCL are found to be negative and significant at 1% level. It means if the LR increases, GWCTR decreases and vice versa. This is absolutely against the theoretical expectation. Therefore the hypothesis that GWCTR is an increasing function of LR is not proved.

Model – 2
The GWCTR Model -2 has been constructed by using five variables viz.,, CR, LR, ITR, DTR, and SIZE as under.
 Model – 2 ==> GWCTR = a + b₁ CR + b₂ ITR + b₃ DTR + b₄ SIZE

The estimated regression results of the working capital Model -2 for the selected cement companies during the period 2010/11 – 2016/17 are presented in Table 6.2.

 Table 6.2 reveals that the estimated working capital function is good under Gross working capital in ACL and UCL since the explanatory power of the equation measured by R^2 and F appear to be good. The value of R^2 varies from 0.93to 0.55. That is about 93 % to 55 % of the variations in GWCTR of the selected cement companies are explained by the variables in that equation. The regression as a whole is highly significant at 1 per cent level in both of the firms under study.

Table 2 Gross Working Capital Turnover Ratios – Model 2
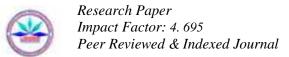(2010-11 to 2016-17)
GWCTR = a + b₁ CR + b₂ ITR + b₃ DTR + b₄ SIZE

	Company	Constant	Co – efficient of				R^2	F Ratio	D.W
			CR (b₁)	ITR (b₂)	DTR (b₃)	SIZE (b₄)			
GWCTR	ACL	2.436 (.035)**	-.056 (.960)	.698 (.007)*	1.712 (.229)	-.149 (.895)	.930	6.673	2.510
	UCL	.016 (.989)	-.019 (.987)	-.790 (.012)**	.990 (.426)	.978 (.031)**	.559	.634	2.106

Note: Figures in parenthesis are computed 'p' value
Significant Level: * 1 Percent, ** 5 Percent,
Source: Centre for Monitoring Indian Economy (CMIE), New Delhi, India

Table 6.2 reveals that the coefficient of ITR in ACL and Size in UCL is found to be positive under the measures of GWCTR and these variables are statistically significant at 1% level under study. It implies that ITR in ACL and Size in UCL impact the GWCTR. Hence the hypothesis that GWCTR is an increasing function of the above variables is proved. But the co efficient of ITR in UCL is found to be negative and significant at 5% level. It means if the ITR increases, GWCTR decreases and vice versa. This is absolutely against the theoretical expectation. Therefore the hypothesis that GWCTR is an increasing function of ITR is not evidenced.

(ii) Regression Models for NWCTR
Model 1
The NWCTR Model -1 has been constructed by using five variables viz.,, CR, LR, ITR, DTR, and SIZE as under.
NWCTR = a + b$_1$ CR + b$_2$ LR + b$_3$ ITR + b$_4$ DTR+ b$_4$ SIZE

The estimated regression results of the NWCTR Model -1 for the selected cement companies during the period 2010/11 – 2016/17 are presented in Table 6.3.

It is perceived from the Table that the estimated working capital function is good under NWCTR in ACL and UCL since the explanatory power of the equation measured by R^2 and F appear to be good. The value of R^2 varies from 0.92 to 0.62. That is about 62 % to 92 % of the variations in NWCTR of the selected cement companies are explained by the variables in that equation. The regression as a whole is highly significant at 1 per cent level in both of the firms under study.

Table 3 Net Working Capital Turnover Ratio – Model 1 (2010-11 to 2016-17)
NWCTR = a + b$_1$ CR + b$_2$ LR + b$_3$ ITR + b$_4$ DTR+ b$_4$ SIZE

	Company	Constant	Co – efficient of					R^2	F Ratio	D.W
			CR (b$_1$)	LR (b$_2$)	ITR (b$_3$)	DTR (b$_4$)	SIZE (b$_5$)			
NWCTR	ACL	37.368 (.017)**	13.494 (.047)**	-27.701 (.023)**	-5.168 (.122)	17.894 (.036)**	28.717 (.022)**	.623	16.915	2.460
	UCL	-1.194 (.444)	.296 (.017)**	.332 (.796)	-1.079 (.476)	1.017 (.495)	.889 (.537)	.924	2.418	2.835

Note: Figures in parenthesis are computed 'p' value
Significant Level: * 1 Percent, ** 5 Percent,
Source: Centre for Monitoring Indian Economy (CMIE), New Delhi, India.

It is evident from Table 6.3 that the coefficient of CR, DTR and Size in ACL and CR in UCL is known to be positive under the measure of NWCTR in these two companies and these are statistically significant at 5% level under study. It implies that CR, DTR and SIZE in ACL and CR in UCL impactthe NWCTR.

Hence the hypothesis that NWCTR is an increasing function of the above variables is proved under this study. But the co efficient of LR in ACL is found to be negative and significant at 5% level. It means if the LR increases, NWCTR decreases and vice versa. This is undeniablycontrary to the theoretical expectation. Therefore the hypothesis that NWCTR is an increasing function of LR is not proved.

Model 2
The NWCTR Model -2 has been constructed by using five variables viz.,, CR, LR, ITR, DTR, and SIZE as under.
NWCTR = a + b$_1$ CR + b$_2$ ITR + b$_3$ DTR + b$_4$ SIZE

The estimated regression results of the NWCTR Model -2 for the selected cement companies during the period 2010/11 – 2016/17 are presented in Table 6.4.

It is perceived from the Table that the estimated working capital function is good under NWCTR in ACL and UCL since the explanatory power of the equation measured by R^2 and F appear to be good. The value of R^2 varies from 0.99 to 0.91. That is about 91 % to 99 % of the variations in NWCTR of the selected cement companies are explained by the variables in that equation. The regression as a whole is highly significant at 1 per cent level in both of the firms under study.

Table 6.4net Working Capital Turnover Ratio – Model 2 (2010-11 to 2016-17)

$$NWCTR = a + b_1\,CR + b_2\,ITR + b_3\,DTR + b_4\,SIZE$$

	Company	Constant	Co – efficient of				R^2	F Ratio	D.W
			CR (b_1)	ITR (b_2)	DTR (b_3)	SIZE (b_4)			
NWCTR	ACL	7.895 (.016)**	-7.686 (.017)**	-2.88 (.102)	3.797 (.063)	1.868 (.203)	.991	53.158	2.506
	UCL	-1.627 (.245)	3.349 (.029)**	-1.46 (.281)	1.322 (.317)	1.107 (.384)	.915	5.397	3.127

Note: Figures in parenthesis are computed 'p' value
Significant Level: * 1 Percent, ** 5 Percent,
Source: Centre for Monitoring Indian Economy (CMIE), New Delhi, India

Table 6.4 reveals that the coefficient of CR in UCL is found to be positive under the measure of NWCTR and this is statistically significant at 5% level under study. It implies that CR in ACL impacts the NWCTR. Hence the hypothesis that NWCTR is an increasing function of the above variables is proved. But the co efficient of CR in UCL is found to be negative and significant at 5% level. It means if the CR increases, NWCTR decreases and vice versa. This is absolutely against the theoretical expectation. Therefore the hypothesis that NWCTR is an increasing function of CR is not evidenced. Other than CR, none of the variable in this model is identified as significant one in these two companies.

Conclusion
In the first model of GWCTR, CR and ITR in ACL and ITR and SIZE in UCL are found to be the determinants of GWCTR under study. In model two of GWCTR, only ITR in ACL and SIZE in UCL are identified as the determinants of the working capital measurement. Besides, according to the first model of NWCTR, CR, DTR and SIZE in ACL and only CR in UCL are known to be the determinants of NWCTR whereas in case of the second model of the NWCTR, only CR is brought into being the determinant of the measurement of the working capital under study. None of the variable is identified as a determinant of working capital in ACL according to the second model of the NWCTR.

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