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237

A Study of Relationship between Working Capital Management and Profitability of Selected Cement Companies in India

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Abstract: The purpose of this study is to find out the relation between working capital management and profitability of cement companies in India. It aims in finding out how working capital management like account receivable and account payable management and cash management affects the profitability of the cement companies in India. Correlation and regression have been used for testing the hypothesis. It is concluded that inventory conversion period and account payable period are negatively correlated with the profitability while account receivable period and cash conversion period depicts positive association with the profitability.

Keywords: Working capital, cement companies, liquidity, profitability, inventory management, correlation, regression, control variables.

1. Introduction

Efficient working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet due short term obligations on the one hand and avoid excessive investment in these assets on the other hand(Eljelly, 2004) It specifically influences the liquidity and profitability of the organization. Profitability at the price of liquidity may hamper the everyday operations of the business so there must be a tradeoff between the two goals. Management of working capital includes management of inventory, receivables, and payable and in totality, cash conversion cycle that tell us in how much time cash is coming back in business. Cash conversion cycle being an indicator of liquidity needs to be investigated to know its impact on the profitability.

A. Problem Statement

Keeping up a sufficient sum of working capital is essential for the uninterrupted operation of any business and satisfaction of twin objective that is to keep a tradeoff between liquidity and profitability. Henceforth, settling between liquidity and profitability is exceptionally important for the firms to arrive at an ideal policy. The purpose behind this research is to determine the connection between efficient management of working capital and Profitability mainly among the Cement Organizations in India. It aims in discovering out how different

components of working capital for instance inventory management, account receivable; account payable and cash management influences the profitability of organization under the cement industry in India.

2. Literature review

Lazaridis and Tryfonidis (2006) examined the relationship between working capital management and profitability .The study was conducted on the sample of 131 companies listed with Athens Stock Exchange for the period covering from 2001-04. Gross operating profit has been taken as measure of profitability. The results depicted a strong statistical significant relation among the components of working capital and profitability. They further reveal that manager can generate profits for their companies by keeping the working capital components at an optimal level.

Shah and Sana (2006), analyzed the influence of working capital management on the profitability. The study was conducted on the sample of 7 oil and gas companies listed with Karachi Stock Exchange for the period of 5 years covering from 2001 to 2005 using ratio analysis and statistical tools. Gross profit has been taken as measure of profitability. Results show a negative correlation between gross profit margin and inventory conversion period and account receivable period, cash conversion period and sales growth whereas gross profit margin is positively correlated with accounts payable period.

Raheman and Nasr (2007) conducted the study on sample of 94 Pakistani firms .They aimed at studying the impact of different variables of working capital management on the profitability. Pearson's correlation and regression analysis has been used for the purpose of the study. The results displayed the strong negative correlation between variables of the working capital management and profitability of the firm. They further found a significant negative relationship between liquidity and profitability and also the debt used by the firm and its profitability. Furthermore, size of the firm was found to be positively correlated with the profitability.

Teruel and Solano (2007) attempted to measure the influence of working capital management on profitability of 8872

International Journal of Research in Engineering, Science and Management
Volume-1, Issue-12, December-2018
www.ijresm.com | ISSN (Online): 2581-5792

238

Spanish SME firms covering the period 1996-2002 using panel data method. The results show that the value for shareholders can be created by reducing their inventory and account payable period and firm's profitability can be improved by shortening the cash conversion period.

Quayyum (2011) attempted to study the influence of working capital management efficiency and maintaining liquidity on the profitability of corporations. For the purpose of the study, firms list in cement industry of Dhaka Stock Exchange had been taken as sample. The study covered a period of 5 years from 2005 to 2009. The aim of this article was to establish a relationship which was statistically significant. The other aim was to find the need of firms optimizing their level of working capital management and maintaining enough liquidity as it affects profitability. The result indicates a significant relation between the profitability measures and various liquidity measures and also working capital components.

3. Methodology used

A. Objectives of the study

Keeping the purpose of the study in mind, this study will focus on main Objective of the study:

- To examine the impact of Account Receivable management on the profitability of selected cement companies in India.
- To examine the impact of Account Payable management on the profitability of selected cement companies in India.
- To examine the impact of cash management on the profitability of selected cement companies in India.

B. Description of variables

This section aims at identifying the variables that have been used to test the hypotheses of this study. They include dependent, independent and control variables. Selection of the variables is based on the previous studies.

1) ROA (Return on Assets)

Return on Assets can be defined as profitability ratio that measures the net income produced by the total assets during the period by comparing net income to the total assets.

2) Account Receivable Conversion period

Account Receivable Conversion period is the average time required to convert the receivables into collection. The formula used in the study to calculate Account Receivable conversion period.

3) Account Payable Conversion period

Account Payable Conversion period is the average number of day's firm takes to pay its suppliers.

4) Cash Conversion Cycle

Cash Conversion Cycle is the sum total of operating cycle – Account payable period. Operating cycle is the total time required to convert inventories into sales which is calculated as Inventory Conversion Period and the time period when sales is tied up as receivables calculated as Receivable Conversion

period .The formula used in the study to calculate Cash conversion cycle period.

Cash conversion cycle= Operating cycle – Account payable period

Operating cycle = Inventory conversion period + Account receivable period

C. Hypotheses formed

Hypothesis 1

H2: Account receivable Management has no significant impact on Return on Assets (ROA) of cement companies in India.

Hypothesis 2

H3: Account Payable period has no significant impact onReturn on Assets (ROA) of cement companies in India.

Hypothesis 3

H4: Cash Management has no significant impact on Return on Assets (ROA) of cement companies in India.

4. Data analysis

Hypothesis 1: Account receivable Management has no significant impact on Return on Assets (ROA) of cement companies in India

Correlation

The correlation result between Account Receivable Period and Return on Assets of cement companies in India indicates that there is negative moderate correlation between both the variables with the value as -0.426 (refer table4.2). This means if Account receivable period increases, than a moderate decrease is seen in the Return on assets of cement companies in India. On interpretation of the significance (2 tailed) value which came out to be 0.061, it can be concluded that statically correlation between ARP and ROA of cement companies in India is seen significant at level of 10%. This means increase or decrease is one variable do significantly relate to increase or decrease in other variable (refer Table 4, 2).

Regression

Multiple hierarchical regression has been used to analyze whether Account receivable period has significant impact on Return on Assets (ROA)of cement companies in India .Table contains two models, model 1 and model 2. Model 1 includes the regression analysis considering only the control variables such as current ratio, size of firm, short term financial assets ratio and Leverage while Model 2 refers to the final regression analysis including both control variables and independent variable i.e. the main component of working capital management, Account receivable period R in the table indicates that positive correlation has been seen between the constant variables and dependent variable, ROA (value 0.506). Positive correlation has been seen between the overall variables including both the independent variable Account receivable period along with constant variables and the dependent variable, ROA at 0.507.

International Journal of Research in Engineering, Science and Management
Volume-1, Issue-12, December-2018
www.ijresm.com | ISSN (Online): 2581-5792

239

Table 1
Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.712[a]	.506	.375	.051522	.506	3.846	4	15	.024	
2	.712[b]	.507	.331	.053294	.001	.019	1	14	.893	1.904
a. Predictors: (Constant), Leverage, Stfa, size of firm, cr										
b. Predictors: (Constant), Leverage, Stfa, size of firm, cr, arp										
c. Dependent Variable: ROA										

Table 2
Excluded variables

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	ARP	-.048[b]	-.138	.893	-.037	.288	3.474	.272
a. Dependent Variable: roa								
b. Predictors in the Model: (Constant), Leverage, Stfa, size of firm, cr								

Table 3
ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.041	4	.010	3.846	.024[b]
	Residual	.040	15	.003		
	Total	.081	19			
2	Regression	.041	5	.008	2.880	.054[c]
	Residual	.040	14	.003		
	Total	.081	19			
a. Dependent Variable: ROA						
b. Predictors: (Constant), Leverage, Stfa, size of firm, cr						
c. Predictors: (Constant), Leverage, Stfa, size of firm, cr, arp						

The result of R square indicates that in model 1 constant variables have moderate relationship with dependent variable ROA signified by R square that is 50.6% (refer Table 1). It shows that 50.6 % of ROA change is because of constant variables change in cement companies in India .However for final model including the Account receivable periodthe value increases to 0.507 or 50.7 %. The difference between the two (50.7% -50.6%) 0.1 % which accounts for an extra 0.1 % variation in dependent variable ROA is because of Account receivable period. The same value in the table (refer Table 1) is shown by the value r square change also.

The adjusted R square provides more accurate value information for the true population. The adjusted r square is 33.1 % for ROA which indicates that formula is moderate fit with Account receivable period.

The tolerance statistics were 0.288 (Refer Table 2) and variance inflation factor (VIF) is 3.474 (Refer Table 2). It is indicating that is no multi-collinearity problems among the independent variables in the data.

In order to find out the autocorrelation in the residual and in regression, Durbin-Watson (DW) value is computed. The result shows the value of 1.904 (Refer Table 1) for ROA which concludes that there exist no autocorrelation in the regression since their DW is close to 2 .Therefore independence of residuals are not violated.

Statistically strong significance has been found between Account receivable period and ROA at a significance level of 5 %. Therefore it can be said that there is an impact of ARP on the ROA of cement companies in India.

Hence, 0.893< 0.05 – Null Hypothesis (H_2 is rejected)

Hypothesis 2: Account Payable period has no significant impact on Return on Assets (ROA) of cement companies in India.

Correlation

The correlation results between Account Payable period and Return on assets of cement companies in India indicates that both these variables are weakly correlated with r value as 0.134. This means if the Account Payable period increases, than a low increase is seen in the ROA of cement companies in India. On interpretation of the significance (2- tailed) value which came out to be 0.574, it can be concluded that there is no statistically significant correlation between Account Payable period and ROA of cement companies in India. This means, increases or decreases in one variable do not significantly relate to increases or decreases in the other variable.

Regression

Multiple hierarchical regression has been used to analyze whether Account Payable period has significant impact on Return on Assets (ROA)of cement companies in India .Table contains two models, model 1 and model 2. Model 1 includes the regression analysis considering only the control variables such as current ratio, size of firm, short term financial assets ratio and Leverage while Model 2 refers to the final regression analysis including both control variables and independent variable i.e. the main component of working capital

International Journal of Research in Engineering, Science and Management
Volume-1, Issue-12, December-2018
www.ijresm.com | ISSN (Online): 2581-5792

240

Table 4
Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.712ᵃ	.506	.375	.051522	.506	3.846	4	15	.024	
2	.716ᵇ	.513	.339	.052954	.007	.199	1	14	.662	1.818
a. Predictors: (Constant), Leverage, Stfa, size of firm, cr										
b. Predictors: (Constant), Leverage, Stfa, size of firm, cr, app										
c. Dependent Variable: ROA										

Table 5
Excluded variables

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	app	-.100ᵇ	-.446	.662	-.118	.687	1.455	.510
a. Dependent Variable: ROA								
b. Predictors in the Model: (Constant), Leverage, Stfa, size of firm, cr								

Table 6
ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.041	4	.010	3.846	.024ᵇ
	Residual	.040	15	.003		
	Total	.081	19			
2	Regression	.041	5	.008	2.953	.050ᶜ
	Residual	.039	14	.003		
	Total	.081	19			
a. Dependent Variable: ROA						
b. Predictors: (Constant), Leverage, Stfa, size of firm, cr						
c. Predictors: (Constant), Leverage, Stfa, size of firm, cr, app						

management, Account Payable period.

R in the table indicates that positive correlation has been seen between the constant variables and dependent variable, ROA (value 0.506). Positive correlation has been seen between the overall variables including both the independent variable Account Payable period along with constant variables and the dependent variable, ROA at .513.

The result of R square indicates that in model 1 constant variables have moderate relationship with dependent variable ROA signified by R square that is 50.6% (refer Table 4). It shows that 50.6 % of ROA change is because of constant variables change in cement companies in India .However for final model including the Account Payable period the value increases to 0.513 or 51.3 %. The difference between the two (51.3% -50.6%) 0.7 % which accounts for an extra 0.7 % variation in dependent variable ROA is because of Account Payable period. . The same value in the table (refer Table 4) is shown by the value r square change also.

The adjusted R square provides more accurate value information for the true population. The adjusted r square is 33.9 % (Refer Table 4) for ROA which indicates that formula is moderate fit with Account Payable period.

The tolerance statistics were 0.687 (Refer Table 5) and variance inflation factor (VIF) is 1.455 (Refer Table 5). It is indicating that is no multi-collinearity problems among the independent variables in the data

In order to find out the autocorrelation in the residual and in regression, Durbin-Watson (DW) value is computed. The result shows the value of 1.818 (Refer Table 4) for ROA which

concludes that there exist no autocorrelation in the regression since their DW is close to 2 .Therefore independence of residuals are not violated.

Statistically strong significance has been found between Account Payable period and ROA at a significance level of 5 %. Therefore, it can be said that there is impact of APP on the ROA of cement companies in India.

Hence, 0.662> 0.05 – Null Hypothesis (H_3 is rejected)

Therefore APP plays a negative significant role in change in ROA.

Hypothesis 3: Cash Management has significant impact on Return on assets (ROA) of cement companies in India.

Correlation

The correlation results between cash conversion cycle and ROA of cement companies in India indicates that both these variables are negatively lowly correlated with r value -0.209. That means if the cash conversion cycle increases, than a low decrease is seen in the ROA of cement companies in India. On interpretation of the significance (2- tailed) value which came out to be 0.376, it can be concluded that there is no statistically significant correlation between cash conversion cycle and ROA of cement companies in India. That means, increase or decrease in one variable do not significantly relate to increase or decrease in other variable.

Regression

Multiple hierarchical regression has been used to analyze

International Journal of Research in Engineering, Science and Management
Volume-1, Issue-12, December-2018
www.ijresm.com | ISSN (Online): 2581-5792

241

Table 7
Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.712[a]	.506	.375	.051522	.506	3.846	4	15	.024	
2	.737[b]	.543	.379	.051324	.036	1.116	1	14	.309	1.874
a. Predictors: (Constant), Leverage, Stfa, size of firm, cr										
b. Predictors: (Constant), Leverage, Stfa, size of firm, cr, ccc										
c. Dependent Variable: ROA										

Table 8
Excluded variables

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	ccc	.275[b]	1.056	.309	.272	.481	2.078	.476
a. Dependent Variable: ROA								
b. Predictors in the Model: (Constant), Leverage, Stfa, size of firm, cr								

Table 9
ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.041	4	.010	3.846	.024[b]
	Residual	.040	15	.003		
	Total	.081	19			
2	Regression	.044	5	.009	3.324	.035[c]
	Residual	.037	14	.003		
	Total	.081	19			
a. Dependent Variable: roa						
b. Predictors: (Constant), Leverage, Stfa, size of firm, cr						
c. Predictors: (Constant), Leverage, Stfa, size of firm, cr, cc						

whether cash conversion cycle has significant impact on Return on Assets (ROA) of cement companies in India .Table contains two models, model 1 and model 2. Model 1 includes the regression analysis considering only the control variables such as current ratio, size of firm, short term financial assets ratio and Leverage while Model 2 refers to the final regression analysis including both control variables and independent variable i.e. the main component of working capital management, cash conversion cycle.

R in the table indicates that positive correlation has been seen between the constant variables and dependent variable, ROA (value 0.506). Positive correlation has been seen between the overall variables including both the independent variable cash conversion cycle along with constant variables and the dependent variable, ROA at .543.

The result of R square indicates that in model 1 constant variables have moderate relationship with dependent variable ROA signified by R square that is 50.6% (refer Table 7). It shows that 50.6 % of ROA change is because of constant variables change in cement companies in India .However for final model including the cash conversion cycle the value increases to 0.543 or 54.3 %. The difference between the two (54.3%-50.6%) 3.7 % which accounts for an extra 3.7 % variation in dependent variable ROA is because of cash conversion cycle. The same value in the table (refer Table 7) is shown by the value r square change also.

The adjusted R square provides more accurate value information for the true population. The adjusted r square is 37.9 % (Refer Table 7) for ROA which indicates that formula

is moderate fit with cash conversion cycle.

The tolerance statistics were 0.481 (Refer Table 8) and variance inflation factor (VIF) is 2.078 (Refer Table 8). It is indicating that is no multi-collinearity problems among the independent variables in the data.

In order to find out the autocorrelation in the residual and in regression, Durbin-Watson (DW) value is computed. The result shows the value of 1.874 (Refer Table 7) for ROA which concludes that there exist no autocorrelation in the regression since their DW is close to 2 .Therefore independence of residuals are not violated.

Statistically strong significance has been found between cash conversion cycle and ROA at a significance level of 5 %. Therefore, it can be said that there is impact of CCC on the ROA of cement companies in India.

Hence, 0.309> 0.05 – Null Hypothesis (H_1 is rejected)

Therefore CCP plays a positive significant role in change in ROA.

5. Results

Hypothesis 1: Account receivable Management has no significant impact on Return on Assets (ROA) of cement companies in India

The result of the study concluded that there exists a negative relation of Account Receivable Period with Profitability measures. The regression result between ARP and ROA are statistically strongly significant. The result implied that Increase or decrease in Account receivable period will have significant negative impact on the profitability .The shorter

International Journal of Research in Engineering, Science and Management
Volume-1, Issue-12, December-2018
www.ijresm.com | ISSN (Online): 2581-5792

242

Account receivable period is more favorable in terms of profit. The results are consistent with the results of the previous studies conducted by chatterjee (2012) Bhagchi , Kamuri (2012) ,Monica Singhania, Navaendu Sharma and Rohit (2014), Deloof (2003), Padachi (2006) , Shah and Sana (2006), Raheman and Nasr (2007) ,Taruel and Solano(2007) , Harsh (2012), Makori and Jagongo (2013) . The study results are dissimilar to the results of Vijay Kumar and Venkatachalam (1996), Pimplapuri, Kulkarni (2011) ,Sharma and Kumar (2011).

There are few more researchers like Singh and Pandey (2008), Mittal et al (2010), Lazaridis and Tryfonidis (2006), Quayyum(2011) who did not clearly stated the positive or negative relation between the account receivable period and profitability but stated that the proper management of working capital components have a significant impact on the profitability.

Hypothesis 2: Account Payable period has no significant impact on Return on Assets (ROA) of cement companies in India.

The study indicates the positive relation of account payable period with the profitability measures as return on assets. The positive relation indicates that the longer account payable period should result in more profits. The regression results states that account payable period is statistically significant with the profitability. The available funds with the firm due to delayed payment could be utilized optimally. The result is similar to result of the study concluded by Monica Singhania, Navaendu Sharma and Rohit (2014), Shah and Sana (2006), Taruel and Solano (2007), Makori and Jagongo (2013)   who suggested that profitability can be increased by increasing the account payable period. The result is inconsistent with the prior results of Chatterjee (2012), Bhagchi, Kamuri (2012), Sharma and Kumar (2011), Padachi (2006), Raheman and Nasr (2007).

Hypothesis 3: Cash Management has significant impact on Return on assets (ROA) of cement companies in India.

The result of this study indicates that cash management has a significant impact on Return on assets of cement companies in India. This study results are similar to that of Lazaridis and Tryfonidis (2006) and Hutchion et al. (2007). They both concluded that there exist a significant relation between the length of CCC with Gross Operating profit and ROI as profitability measure. Yazdanfar and Ohman (2014), Upadhyay, Sen and Smith (2015), Talezari, Garkaz and Gorganlidavaji (2015) concluded that there is a significant correlation between cash conversion cycle and profitability which again doesn't match with the results of this study.

The results are dissimilar to that of Deloof (2003), Shin and Soenen (1998), Chatterjee (2012), Monica Singhania, Navaendu Sharma and Rohit (2014), Shah and Sana (2006), Makori and Jagongo, (2013). The results of this study also match with that of Shin and Soenen (1998), Desai and Joshi

(2011), Sharma and Kumar (2011), Panigrachi and Muscettola (2014). Panigrachi stated that cash conversion cycle is not always the reason for greater profitability. Muscettola (2014) concluded that there is no significant association between cash conversion cycle and profits of the firm.

6. Conclusion

The result of the study concludes that the Current ratio taken as liquidity measure is having significant negative association with return on assets taken as profitability measure. It indicates that maintaining an adequate amount of liquidity is really essential for cement firm to have adequate profits. Raheman and Nasr (2007), Quayyum (2011) also concluded a significant negative association between liquidity and profitability measures.

Size of the firm which is taken as logarithm of the sales is having a significant positive association with the Return on assets. It means that the firms having larger sales enjoy more profits. This result is consistent with the past studies conducted by Eljelly (2004), Raheman and Nasr (2007), Chatterjee (2012). Short term financial assets ratio which is calculated as Loans and Advances to Total assets of the firm is having an insignificant association with both the profitability measures as return on investment and return on assets. The leverage position of the cement industry is having insignificant negative association with profitability measures.

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243

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