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RESEARCH ARTICLE

CASH CONVERSION CYCLE AND FIRMS' PROFITABILITY – A STUDY OF CEMENT MANUFACTURING COMPANIES OF INDIA

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ABSTRACT

Cash conversion cycle (CCC) has been considered a useful measure of firm's effective working capital management and especially the cash management. This study was conducted with the aim to look into the association of the cash conversion cycle with the size and profitability of the firm. The present study is concerned about evaluating how cash conversion cycle affects the profitability of cement manufacturing companies in India. The specific research objective of the study is to investigate the existing literature on the role of cash conversion cycle in enhancing return on assets and equity of the companies and to measure the impact of cash conversion cycle on profitability of the manufacturing companies. The results of the study will be helpful for academics and industry experts for policy making and control purposes. The study takes return on equity and return on assets as measures of profitability to represent dependent variables. Firm size and debt ratio are taken as control variables. Cash conversion cycle is considered as independent or explanatory variable. Study takes into consideration top five Indian cement companies for a period of 10 years starting from 2001 to 2010. Results showed that the selected companies are having low average return on asset and return on equity with significantly negative cash conversion cycle. Regression results after adjusting for heteroskedasticity of data to minimize the effects of outliers showed that cash conversion cycle is having significantly positive association with both return on assets and equity indicating that it is not necessary that always there must be lesser the cash conversion cycle greater would be the profitability measured through return on assets and equity. If the firm is able to sell the inventory and collect the receivables before it pays to the payables, then the situation would be little bit different. As happened in our case, firms are not under pressure to reduce the receivable collection period and inventory selling period along with the extension of payment period to increase the profitability.

INTRODUCTION

The WCM theory is based on the traditional models of the CCC that is initiated by Richards and Laughlin (1980). It is a great measure to know that how fine a corporation is organizing its working capital (Nobanee *et al*. 2011). Gitman (1974) concluded that CCC is the most important aspect in WCM. In fact, it tells about the investment and credit decisions in the customer, inventory and suppliers, which show average number of days started from the date when the firm starts payments to its suppliers and the date when it begins to receive payments from its regulars. It measures the time it takes to convert cash into cash again from the time when inventory is bought till the time inventory is sold and the bills are recovered (Padachi, 2006). Cash conversion cycle of individual firms as well the collective cycle of the industry, highlights how the firms are performing; moreover it also helps to dig out the areas where further improvement is required (Hutchison, 2007). For the business owners, one of the most important tasks is to estimate and evaluate cash flows of the business, to well identify the long run and short run cash inflows and outflows to timely sort out the cash shortages and excess to formulate financing and investing strategies respectively. It also helps in planning the payments to creditors on time to avoid losing reputation and trust of the customers and to avoid potential bankruptcy. Generally cash management is based on cash conversion cycle and is considered as important factors enhancing the performance of companies, since it shows how efficient a firm is in its payments of bills, collection of payments, and selling of inventory. Companies can enhance their profitability by lessening their length of cash conversion cycle through decreasing or lessening the receivables collection period, decreasing or lessening the inventory selling period and increasing or lengthening the credit payment period. Since every corporate organization is extremely concerned about how to sustain and improve profitability, hence they have to keep an eye on the factors affecting the profitability. In this regard, liquidity management having its implications on risks and returns of the corporate organizations cannot be overlooked by these organizations and hence cash conversion cycle being indicator of the liquidity management needs to be explored as to how it may affect the profitability of the corporate units. Today due to changing world's economy, advancement of technology and increased global competition among the companies, every company is striving to enhance their profits and for that companies are putting every effort to bring their cash conversion cycle at optimum level to increase profitability. The present study is concerned about evaluating and measuring about how the changes in cash conversion cycle affects the changes in the profitability of the selected cement manufacturing companies of India.

Objective of Study

The specific research objective of the study is to investigate the existing literature on the role of cash conversion cycle in enhancing profitability of the companies and to measure the role of cash conversion cycle in explaining the variations in the profitability of the selected cement companies.

Scope of Study

The study considers only the selected cement manufacturing companies listed in Bombay Stock Exchange of India.

Significance of Study

The results of the study will be helpful for academics and industry experts for policy making and control purposes.

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Literature Review

Earlier literature has explored different variables representing liquidity and its effect on profitability and examined the relationship of accounts payable management, accounts receivables management, inventory management and cash to cash cycle management with profitability management, providing with different results as per how the length of cash cycle has been affecting profitability using different proxies for profitability

Richards and Laughlin (1980) presented the idea of cash conversion cycle as a tool for measuring the liquidity management and performance of a company. Gentry *et al*. (1990) suggested that cash conversion cycle affects the market value of a firm. Lamberson (1991) suggested, during expansion in economics, liquidity increases to some extent by working capital management but there is no noticeable change seen during economic slowdown. Schilling (1996) proved that the increase in cash conversion cycle increases the minimum liquidity requirements of the business organizations and similarly decrease in cash conversion cycle decreases the minimum liquidity requirements of the business organizations. Schilling (1996) stated that the optimal level of liquidity position is obtained at minimized level of liquidity therefore the deployment of available resources in working capital in a way to attain and maintain optimal level of liquidity is mandatory, the study further set up the association of cash conversion cycle with the required minimal level of liquidity in a way that if at times cash conversion cycle increases the minimal level required for liquidity gets to upper levels; and if at times the cash conversion cycle decreases the minimal level required for liquidity moves down to lower levels. Shin and Soenen (1998) found significant impact of efficient cash cycle conversion management on profitability and liquidity of companies.

Lyroudi and Lazaridis (2000) argues that the company's profitability depends on working capital management. Lyroudi and Lazaridis (2000) provided some evidence that cash conversion cycle significantly affects the liquidity of the company. Filbeck and Krueger (2003) investigated that there are some other factors that affect the working capital management like interest rate; if the interest rate rises it will make longer the cash cycle period. Deloof (2003) stated that for better performance the time duration for collection of receivable should be kept short. Nobanee *et al*. (2004) suggested that for better performance of company inventory must be converted into cash as early as possible. Eljelly (2004) found significantly inverse association and linkage between the profitability and the liquidity represented by the cash conversion cycle. Deloof (2003) studied the impact of WCM practices on earning efficiency of 1009 companies for a period of 5 years data using the CCC period as the efficiency tool for good WCM practices. He concluded with a strong negative association between the CCC period and profitability.

Padachi (2006) found that if the firm is invested higher in the inventories then the optimum level will diminish and profit will go down. Teruel and Solano (2007) explained that company's profitability would be increased by reducing days in receivables, days in inventories and length of cash cycle. Hutchison *et al*. (2007) observed significant association of cash conversion cycle with the return on investments of the companies. Raheman and Nasr (2007) reported significant and negative association of components of liquidity with profitability. Hutchison *et al*. (2007) suggested an inverse relationship between profitability and cash conversion cycle. Teruel and Solano (2007) suggested that firm should delay in making the payments for efficient performance. Raheman and Nasr (2007) stated that for better performance the time duration for collection of receivable should be kept short. Appuhami (2008) investigated that operating cash flows have significant impact of firm working capital management. Koumanakos (2008) stated that the higher the average inventories are conserved the lower the rate of return. Samiloglu and Demirgunes (2008) analyzed the effect of WCM practices on firms' profitability. They found a negative relationship between the profitability and the debtors' turnover days, sock turnover days and the financial leverage, with the exception of sales growth which had a positive impact on firm's earnings. Singh and Pandey (2008) also analyzed association between WCM practices and performance in the context of the Hindalco Industries for an eighteen years data. Lazaridis and Tryfonidis (2006) also analyzed association between WCM practices and performance and found a strong relationship between the WCM ratios and firm performance, and their results from regression analysis showed strong association between profitability (gross operating profit) and CCC. It was also argued by them that an efficient and optimal CCC management was vital for increasing the shareholders worth.

Afza and Nazir (2009) found a significantly positive relationship of working capital management and profitability. Uyar (2009) also found significant association and linkage of working capital management with liquidity and profitability and concluded that the firm size is negatively linked and related to cash conversion cycle and a negative and oppositely moving linkage of cash conversion cycle with profitability was observed. Luo *et al*. (2009) stated that if the value of the firm enhances the cash cycle will decrease. Gill *et al*. (2010) found that if the firm is maintaining it accounts receivable, accounts payable and inventories at optimum level the firm will generate maximum profit. Dong and Su (2010) observed significant association of cash conversion cycle with the return on investments of the companies. Sharma and Kumar (2010) found that in Indian firm length of cash cycle and profitability have positive relationship between them. Randall and Farris (2010) argued that by implementing a collaborative cash to cash management cycle by adopting weighted average cost of capital will increase the profitability. Johnson and Templar (2011) stated that return on capital employed and length of cash cycle would be enhanced by change of proxy. Ebaid (2011) examined that the current cash flows have significant impact to enhance the profitability of the firm.

METHODOLOGY

Rationale of Study

The rationale of the research is to examine the impact of length of cash cycle management on profitability. Earlier literature depicts mixed results, hence it may be concluded that the relationship must be investigated further under different settings to better generalize the results for future propositions in this regard. So in this research return on equity and return on assets are taken as proxies of profitability to identify and measure the association and relationship between length of cash conversion cycle and profitability as measured by return on assets and return on equity, while taking size of firm and debt ratio as control variables.

Measurement of Dependent, Independent and Control Variables

The study takes return on equity and return on assets as measures of profitability to represent dependent variables. It explains how firm and organizations can increase their revenue and generate sales by utilizing the available resources optimally. Firm size and debt ratio are taken as control variables whereas cash conversion cycle is considered as independent variable. The studied variables are calculated as follows:

Inventory Conversion Period (ICP) = (Average Inventories/Net Sales) x 365
Average Receivables Period (ARP) = (Average Debtors/Net Sales) x 365
Average Payables Period (APP) = (Average Creditors / Net Purchases) x 365
Cash Conversion Cycle (CCC) = Inventory Conversion Period + Average Receivables Period – Average Payables Period
Return on Assets = Net Profit/ Total Assets
Return on Equity = Net Profit/ Shareholders' Equity
Size of Firm = Natural Log of Sales
Debt = Total Debt/ Total Assets

Research Model

On the basis of review of the literature; following relationships have been predicted to be further tested statistically to conclude the results of the study.

$ROAit = \alpha + \beta 1\ Sizeit + \beta 2\ Debtit + \beta 3\ CCCit + eit$
$ROEit = \alpha + \beta 1\ Sizeit + \beta 2\ Debtit + \beta 3\ CCCit + eit$

Where;

ROE = Return on Equity
ROA = Return on Assets
CCC = Cash Conversion Cycle
Size = Natural Log of Sales
Debt = Financial Debt Level
α = Constant Term
β = Coefficient Term
i = No of firms ranging from 1- 50
t = Time Period ranging from 2001 – 2010

Population and Sampling

For the purpose of the study, five cement manufacturing companies of India listed at Bombay Stock Exchange are taken to measure the impact of cash conversion cycle on profitability of the studied sector.

Period of Study

Study takes into consideration 10 years financial statements data starting from 2001 to 2010.

Data Collection

Secondary data is collected from the website www.moneycontrol.com

Hypotheses

H1: Cash conversion cycle has a significant inverse association with return on assets

H2: Cash conversion cycle has a significant inverse association with return on equity

Data Analysis

The descriptive analysis shown in Table 1 below depicts that the mean value of the variable return on asset is around 10 percent and return on equity is around 17 percent with standard deviation of 0.06 and 0.09 respectively; the mean value for cash conversion cycle of all the companies together is around 417.49 days which is negative and a high standard deviation. This means that the companies doesn't pay their suppliers until it receives payment from the debtors and therefore, they do not have a need to hold very much inventory and still hold onto their money for a longer period of time. It should be noted that you can have a negative cash conversion cycle. If this occurs it means that you are selling your inventory and collecting your receivables before you have to pay your payables. Correlation Matrix is used to find the relationship between different variables. The correlation matrix table below discloses that there is positive and moderate correlation between cash conversion cycle and return on assets. But there is a positive and significant correlation between cash conversion cycle and return on equity. Similarly negative and weak correlation of cash conversion cycle was observed with size and debt level.

In order to check relationship between the studied variables, regression analysis is used after adjusting for heteroskedasticity of data to minimize the effects of outliers. Such a robust regression analysis finds out the effect and relationship of certain variable with other variables. Return on assets and return on equity are separately regressed with independent and control variables to get the outcomes of the predicted relationships. Results of regression analysis with return on assets are shown in Table 3 below. The results show that the cash conversion cycle is moderately and positively related to return on assets which contradicts the general rule of lesser the cash conversion cycle greater would be the profitability as measured by return on assets. This happens because firms are having high negative cash conversion cycle which indicates that the company is paid for sales before it pays for the product it sells, it has much more financial flexibility. This leads to rejection of the first hypothesis H1. Size and debt as control variables are insignificant. Results of regression analysis with return on equity are shown in table 4 below. The results show that the cash conversion cycle is significantly and positively related to return on equity indicating that higher the cash conversion cycle greater would be the profitability as measured by return on equity.

Table – 1

DESCRIPTIVE STATISTICS

VARIABLES	Observations (N)	Minimum	Maximum	Mean	S.D.
Return on Assets (ROA)	50	.03	.17	.10	.06
Return on Equity (ROE)	50	.02	.24	.17	.09
Cash Conversion Cycle (CCC)	50	-923.21	-161.88	-417.49	292.69
Size of the Company = Natural Log of Sales (Ln Sales)	50	6.83	8.43	7.56	.69
Total Debt to Total Asset Ratio (DEBT)	50	.33	.65	.47	.13

Table – 2

Correlations Analysis

		ROA	ROE	CCC	Ln SALES	DEBT
ROA	Pearson Correlation	1	.769	.481	.839	-.786
	Sig. (2-tailed)		.128	.413	.076	.115
	N	5	5	5	5	5
ROE	Pearson Correlation	.769	1	.927	.333	-.379
	Sig. (2-tailed)	.128		.024	.584	.529
	N	5	5	5	5	5
CCC	Pearson Correlation	.481	.927	1	-.046	-.084
	Sig. (2-tailed)	.413	.024		.942	.893
	N	5	5	5	5	5
Ln SALES	Pearson Correlation	.839	.333	-.046	1	-.780
	Sig. (2-tailed)	.076	.584	.942		.120
	N	5	5	5	5	5
DEBT	Pearson Correlation	-.786	-.379	-.084	-.780	1
	Sig. (2-tailed)	.115	.529	.893	.120	
	N	5	5	5	5	5

Table – 3

Regression Results – Return on Assets						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
ROA (Dependent Variable)	(Constant)	-.317	.170		-1.868	.313
	CCC	.000	.000	.498	4.144	.151
	Ln SALES	.067	.018	.717	3.748	.166
	DEBT	-.089	.092	-.185	-.965	.511

Table – 4

Regression Results – Return on Equity						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
ROE (Dependent Variable)	(Constant)	-.056	.018		-3.147	.196
	CCC	.000	.000	.942	103.262	.006
	Ln SALES	.047	.002	.363	24.977	.025
	DEBT	-.011	.010	-.017	-1.176	.449

This happens because firms are having high negative cash conversion cycle which indicates that the company is paid for sales before it pays for the product it sells, it has much more financial flexibility. This leads to rejection of the second hypothesis H2. Size and debt as control variables are insignificant.

Conclusion

Cash conversion cycle is significant for every manufacturing company since it helps the financial managers to figure out the inventory holding period as reflected by the total number of days the cash of a company remains blocked in to the business operations cycle starting from the manufacturing of inventory till selling of that inventory. Cash cycle is very powerful tool for examining how well a manufacturing company's working capital is being managed. Financial managers have to run the manufacturing companies for longer period and for that they make decisions to manage working capital by creating a balance between the available current assets and current liabilities. Moreover the financial managers can reduce the risk of future shortfall of cash and bankruptcy by managing cash conversion cycle well. In the present study the result showed that cash conversion cycle is having significantly positive association with both return on assets and equity indicating that it is not necessary that always there must be lesser the cash conversion cycle greater would be the profitability measured through return on assets and equity. If the firm is able to sell the inventory and collect the receivables before it pays to the payables, then the situation would be little bit different. As happened in our case, firms are not under pressure to reduce the receivable collection period and inventory selling period along with the extension of payment period to increase the profitability. Interestingly, here appears a significant positive relationship between the length of CCC and the profitability of firms in terms of return on assets and return on equity giving a strong indication to the firm managers/owners that longer the CCC turnover in days, lesser capital will be deployed in current assets and eventually there will be more capital investment leading towards a higher profitability of the firm.

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Appendices

DETAILS OF COMPANIES UNDER STUDY

Sl. No.	Company Name	Total Assets as on 31-3-2010 (Rs. In Crores)	Size Group	Year of Incorporation	Age Group	State	Region
1	Ambuja Cements	7,395.13	Large	1981	New	Gujarat	West
2	ACC	6,993.31	Large	1936	Very Old	Maharashtra	West
3	India Cements	6,268.54	Large	1946	Very Old	Tamil Nadu	South
4	Madras Cements	4,124.67	Large	1957	Old	Tamil Nadu	South
5	Shree Cements	3,840.48	Large	1979	Old	Rajasthan	West

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