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Analyzing the Impact of Working Capital Management on Profitability: A Study on DSE Listed Cement Companies in Bangladesh

By Saptarshi Dhar
Jahangirnagar University

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Analyzing the Impact of Working Capital Management on Profitability: A Study on DSE Listed Cement Companies in Bangladesh

Saptarshi Dhar

Abstract- The study is an analysis on the impact of working capital management on profitability of cement companies in Bangladesh. The study comprises all the 7 cement companies that are listed on the Dhaka Stock Exchange (DSE). Gross Operating Profit has been used as proxy for profitability and cash conversion cycle and its components (accounts receivable period, inventory conversion period and payables deferral period) have been used as proxy for working capital. The study used panel data regression technique and data were collected from secondary sources for the period 2007-2015. Results show that cash conversion cycle, accounts receivable period and inventory conversion period have significant negative impact on profitability whereas payables deferral period has significant positive impact on profitability for the sampled companies.

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I. Introduction

Working capital refers to capital available for running day to day operations of a business. It is the measurement of firm's ability to meet its short-term obligations. Positive working capital means the firm can pay off its short-term liabilities. Negative working capital means that a firm is unable to meet the short-term liabilities with its current assets. Key components of working capital are receivables, payables, cash and its equivalents. Working capital management (WCM) involves management decisions about cash, inventory, account receivables and payables which are crucial components of financial management for a firm.

Efficient management of working capital is very important because it impacts profitability of a firm (Taleb et al., 2010). Insufficient working capital leads to liquidity problems, on the other hand, holding excess working capital results in reduction of profitability (Ghosh & Maji, 2003). Excess working capital means having idle funds that do not generate any return for the firm. Inadequate working capital disrupts production process and ultimately reduces profit. Through efficient working capital management, a firm can maintain proper level of working capital and pay off obligations timely (Eljelly, 2004). The goal of WCM is to maintain an optimum balance among the components of working capital to maximize financial health of the firm.

A popular measurement of WCM is cash conversion cycle (CCC) (Raheman & Nasr, 2007). It is the time lag between purchase of raw materials to collection of cash from sale of good or service rendered. The longer the CCC, the larger the investment in working capital (Deloof, 2003). Profitability might be increased through long CCC as it increases sales. However, profitability of a firm might also decrease with CCC, if cost of investment is greater than the benefits of holding more inventories and/or granting more trade credit.

Cement sector in Bangladesh is experiencing an upsurge in usage of cement. Increase in demand for cement is due to acceleration in urban development, with construction of houses, apartments and infrastructural development projects such as Padma Bridge, Gulistan Jatrabari Flyover, Kuril Flyover, Hatirjheel Project, Dhaka-Chittagong Access Control Highway, Dhaka Metro Rail Transit, Dhaka-Narayanganj-Gazipur-Dhaka Elevated Expressway and deep-sea port in Chittagong (Nur, 2014; Kabir, 2013). According to Nahar (2012), the industry is currently in growth stage. Bangladesh exports cement to Myanmar and northeastern states of India including Tripura, Meghalaya and Assam. (Kabir, 2013).

The impact of WCM on profitability for cement companies are examined by Almazari (2014); Arshad and Gondal (2013), Haq et al. (2011), Manzoor (2013), Ramana, Ramakrishnaiah and Chengalrayulu (2013), and Rehman and Anjum (2013) among others. However, there are few studies with reference to Bangladesh in the context of cement companies such as Dhar and Aziza (2018), Mizan and Hossain (2014), and Quayyum (2011). Quayyum (2011) examined effect of WCM on profitability of four listed cement companies of the Dhaka Stock Exchange (DSE) for the period 2005-2009 using cross section data.

In this context, the aim of this paper is to provide a more robust analysis on the impact of WCM on profitability by using panel data. Panel data is a data set comprising both time series and cross-sectional elements (Stock & Watson, 2010). This study is focused on analyzing the impact of working capital management on profitability of cement companies listed in the Dhaka Stock Exchange. To understand the impact of WCM on

Author: Lecturer Institute of Business Administration (IBA-JU) Jahangirnagar University Savar, Dhaka 1342, Bangladesh.
e-mail: saptarshi@juniv.edu

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profitability for cement companies, the impact of CCC and its components on profitability are statistically analyzed.

II. Review of Literature

In literature, traditional definition of working capital is current assets minus current liabilities (Preve & Sarria-Allende, 2010). Current assets include inventories, accounts receivable, cash and its equivalents. Working capital management is defined as financing current assets and managing current assets and current liabilities of firm (Vural et al., 2012). Naser et al. (2013) identified working capital management as the management of cash, receivables, inventories and payables. Ganesan (2007) explained working capital management as short-term financing requirements of a firm.

According to Bieniasz and Golas (2011) receivables is the number of days from the moment of sale (issuing of invoice) until receiving of the payment. Credit sales create accounts receivable and increase sales volume. However, this can lead to increase in bad debts (Bhattacharya, 2009). Bernstein and Wild (1998) state that increase in average collection period generally reflects poor collection efforts, delays in customer payments and financial distress faced by the customer.

Mathuva (2009) defined inventory conversion period as the time taken to convert inventory held into sales. Cost of inventory tends to increase if inventory conversion period increases (Jayarathne, 2014). So, the purpose of inventory management is to minimize these costs without causing disruption in the production (Bhattacharya, 2009).

According to Jayarathne (2014), cash conversion cycle starts with purchase of raw materials followed by production process converting the raw materials into finished goods. Finished goods are then sold. He defined payable period as the time lag between arrival of stock to the company and payment of cash to suppliers for the materials. If payment period is increased, it may result in loss of good suppliers (Bhattacharya, 2009).

Uyar (2009) studied the relationship of cash conversion cycle with firm size and profitability for firms listed at Istanbul Stock Exchange. The study found significant negative correlation between cash conversion cycle and profitability. Raheman and Nasr (2007) studied the effect of different variables of working capital management including average collection period, inventory turnover in days, payable deferral period, cash conversion cycle and current ratio on net operating profitability of Pakistani firms. The authors found a strong negative relationship between variables of working capital management and profitability. They also found that as the cash conversion cycle increases, it leads to decrease in profitability of the firm and managers can create a positive value for the shareholders by reducing the cash conversion cycle to a possible minimum level. Padachi (2006) examined the trends in working capital management and its impact on firm's performance for 58 Mauritian small manufacturing firms during 1998 to 2003. He explained that a well designed and implemented working capital management is expected to contribute positively to the creation of firm's value. The results indicated that high investment in inventories and receivables is associated with low profitability. Lazaridis and Tryfonidis (2006) found a significant negative relationship between cash conversion cycle and gross operating profit. The findings reveal that managers can create profit for their companies by maintaining the cash conversion cycle and its components (accounts receivable, accounts payable and inventory) to an optimal level. To extend Lazaridis and Tryfonidis's findings, Gill et al. (2010) found statistically significant relationship between cash conversion cycle and profitability, measured through gross operating profit. Deloof (2003) found a significant negative relation between gross operating income and the collection period of accounts receivable, average days in inventories and accounts payable of Belgian firms. The results suggested that managers can create value for shareholders by reducing collection period of accounts receivable and average days in inventories to a reasonable minimum.

In case of research on working capital management and profitability for cement companies, Almazari (2014); Arshad and Gondal (2013); Manzoor (2013); Ramana et al. (2013); Rehman and Anjum (2013); Haq et al. (2011) have conducted study among others. For Saudi cement companies, Almazari (2014) found that current ratio affected profitability and as the size of a firm increased, profitability increased. However, when debt financing increased, profitability declined. Linear regression confirmed a high degree of association between working capital management and profitability. Arshad and Gondal (2013) found that current ratio and net current assets to total assets have significantly positive effect on profitability meaning when accounts receivable lengthen, profitability increases. However, quick ratio has significantly negative effect on profitability indicating that profitability decreases when inventory periods increase. Manzoor (2013) found significant negative relationship between average collection period, inventory turnover period and firm size with profitability. Positive significant relationship was found between leverage and profitability. Ramana et al. (2013) found that receivables management has significant impact on profitability. Rehman and Anjum (2013) concluded that WCM has negative association with profitability meaning when working capital increases, profitability decreases. Haq et al. (2011) found that current ratio, liquid ratio, current assets to total assets ratio, debtors' turnover ratio and cash turnover ratio have significant positive relation with return

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on investment. This positive relationship showed that working capital management except inventory turnover ratio has significant positive impact on profitability of cement companies.

In case of cement companies in Bangladesh, Quayyum (2011) investigated the effect of working capital management efficiency on the profitability of companies listed with the Dhaka Stock Exchange. The study was a cross section data evaluation and found that cash conversion cycle negatively affects profitability of a firm, expressed by return on asset. A study by Dhar and Aziza (2018) investigated the relationship between working capital and EPS of cement companies in Bangladesh. The authors found no significant impact of working capital on EPS of cement companies.

III. Research Design and Methodology

a) Sample Size and Data Collection

The study is based on an all-inclusive sampling of all the 7 cement companies listed on the Dhaka Stock Exchange (DSE) for the period 2007-2015. Only listed companies were selected primarily for the availability and reliability of the data as listed companies are required to present annual reports to make their shares more attractive to investors.

b) Data Collection

The sources of the data for the study are secondary in nature, comprising annual reports and financial statements.

c) Empirical Model

The empirical framework for this study is based on Deloof (2003); Raheman and Nasr (2007) and Shin and Soenen (1998).

Four models are employed to see the impact of working capital management using cash conversion cycle and its components on profitability. These models regress Gross Operating Profit (GOP) as proxy for profitability for firm i at time t.

$$GOP_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 SIZE_{it} + \beta_3 SG_{it} + \beta_4 LEV_{it} + \varepsilon_{it} \quad (1)$$

$$GOP_{it} = \beta_0 + \beta_1 ACP_{it} + \beta_2 SIZE_{it} + \beta_3 SG_{it} + \beta_4 LEV_{it} + \varepsilon_{it} \quad (2)$$

$$GOP_{it} = \beta_0 + \beta_1 ICP_{it} + \beta_2 SIZE_{it} + \beta_3 SG_{it} + \beta_4 LEV_{it} + \varepsilon_{it} \quad (3)$$

$$GOP_{it} = \beta_0 + \beta_1 APP_{it} + \beta_2 SIZE_{it} + \beta_3 SG_{it} + \beta_4 LEV_{it} + \varepsilon_{it} \quad (4)$$

Where CCC_{it} (cash conversion cycle), Capet (average collection period), ICP_{it} (inventory conversion period), APP_{it} (payables deferral period) are used as proxy for working capital for firm i at time t; $SIZE_{it}$ is the natural log of total assets for firm i at time t; SG_{it} is the natural log of sales for firm i at time t; LEV_{it} is debt ratio for firm i at time t; α is the intercept and εit is the error term. Here GOP is the dependent variable, CCC, ACP, ICP and APP are the independent variables, and Size (SIZE), Sales Growth (SG) and Leverage (LEV) are used as control variables to adjust the individual firm effect.

Hypothesis

To examine the above models, the following hypothesis was developed.

H_0: There is no significant impact of working capital management on profitability.

H_1: There is significant impact of working capital management on profitability.

As the study used panel data, choice between Random effect models versus fixed effect model was performed which is a classical test for panel data analysis. To determine which of these models is appropriate, coefficients are estimated for both random effect and fixed effect and then Housman test was performed to decide the appropriate model. Housman test failed to reject null hypothesis, therefore implying random effect model is the appropriate fit. Random effect model is estimated using GLS method.

IV. Results and Discussion

Table 1 presents the summary statistics of all variables in the study. Gross operating profit is on average 23.93 Taka and standard deviation is 13.27. It means that profitability can deviate from the mean value to both sides by 13.27. The average cash conversion cycle is 49.18 days and standard deviation is 44.25 days. Other variables also follow similar patterns.

Table1: Descriptive Statistics

Variable	Label	Obs	Mean	Standard Deviation	Minimum	Maximum
GOP	Gross Operating Profit in Taka	63	0.2393	0.1327	-0.007	0.5047
CCC	Cash Conversion Cycle in Days	63	49.1808	44.2519	-27.1706	198.752
ACP	Average Collection Period in Days	63	50.5098	46.2312	8.4687	223.8953
ICP	Inventory Conversion Period in Days	63	63.6443	34.8664	24.3028	236.1099
APP	Payables Deferral Period in Days	63	66.3395	61.7447	8.9788	298.0796
SIZE	Enterprise Size in Taka	63	21.0719	2.1208	15.7906	23.1508
SG	Sales Growth in %	63	0.2426	0.3219	-0.3688	1.5884
LEV	Leverage in %	63	0.5559	0.2233	0.1948	0.9042

Source: Author's own calculation

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Table 2 presents the Pearson coefficient of correlation for pairs of variables. GOP and CCC are negatively correlated with a coefficient of -0.394. This result is consistent with findings by Deloof (2003); Riemann and Nasr (2007) and Quayyum (2011). It shows cash conversion cycle has negative relation to gross operating profit, indicating profitability could be improved by decreasing cash conversion cycle. There is a significant positive correlation between GOP and APP. It means average collection period has a positive relation to profitability, thereby when payables deferral period increases, profitability also increases. It can be interpreted as the longer companies take to pay their bills, the more profitable they are. There is a significant negative correlation between GOP and ACP and GOP and ICP. It indicates that if a company takes more time in collecting receivables and selling inventory, respectively, profitability will decrease.

Table 2: Correlation Matrix

	GOP_{it}	CCC_{it}	ACP_{it}	ICP_{it}	APP_{it}	$SIZE_{it}$	SG_{it}	LEV_{it}
GOP_{it}	1.000							
CCC_{it}	-0.394*	1.000						
ACP_{it}	-0.545**	0.215	1.000					
ICP_{it}	-0.337*	0.570**	0.364*	1.000				
APP_{it}	0.348*	-0.235	0.790**	0.417**	1.000			
$SIZE_{it}$	-0.561**	0.131	0.013	0.143	-0.138	1.000		
SG_{it}	-0.152	0.242	-0.135	-0.033	-0.127	0.258	1.000	
LEV_{it}	-0.468**	0.084	0.117	0.287	0.234	0.312	-0.154	1.000

**Correlation is significant at the 0.05 level, **Correlation is significant at the 0.01 level*

Source: Author's own calculation

Table 3 presents the results of random effect GLS regression. Results show that the regression coefficients of CCC, ACP, ICP and APP are statistically significant. It implies that these variables have significant relationship with GOP. In other words, cash conversion cycle, average collection period, inventory conversion period and payable deferral period of the sampled firms during the study period have significant impact on gross operating profit, thereby impacting profitability of the firm. CCC, ACP and ICP have negative coefficients, implying that cash conversion cycle, average collection period and inventory conversion period have significant Negative impact on profitability (GOP). These results are in confirmation with Abuzayed (2012); Eljelly (2004); Deloof (2003); Jayarathne (2014); Raheman et al. (2010) and Rahman and Nasr (2007). Only payable deferral period (APP) has significant positive impact on profitability. This is in confirmation with Azam and Haider (2011); Charitou et al. (2010) and Raheman et al. (2010). Results also show that debt ratio and profitability move in opposite directions. Based on the results, it can be further interpreted that when a company increases its debt financing, this might lead to decrease in profitability.

Table3: Random Effect GLS Regression

Regression Model	(1)	(2)	(3)	(4)
Variables	Regression Coefficient			
CCC_{it}	-0.0035 (0.00)			
ACP_{it}		-0.001 (0.04)		
ICP_{it}			-0.0009 (0.03)	
APP_{it}				0.0002 (0.04)
$SIZE_{it}$	-0.0021 (0.04)	-0.0033 (0.06)	-0.0032 (0.06)	-0.0101 (0.09)
SG_{it}	0.0028 (0.31)	0.0027 (0.12)	0.0018 (0.52)	0.0022 (0.17)
LEV_{it}	-0.0031 (0.00)	-0.0081 (0.00)	-0.0010 (0.00)	-0.0070 (0.00)
Constant	0.0093 (0.00)	0.0093 (0.00)	0.0097 (0.00)	0.0094 (0.00)
Adjusted R^2	0.5045	0.5139	0.6361	0.4805
F statistics	31.48 (0.00)	23.74 (0.00)	60.06 (0.00)	20.98 (0.00)
Hausman Test	(0.5318)	(0.5840)	(0.1400)	(0.5699)

Source: Author's own calculation

Based on the results, it can be concluded that the alternate hypothesis (H1) that WCM has significant impact on profitability is to be accepted. At a 95% level of confidence, the null hypothesis is rejected as GLS regressions show that working capital management (measured by cash conversion cycle and its components) have significant impact on profitability (measured by gross operating profit).

V. Conclusion

Cement industry in Bangladesh is currently in the growth stage and has potential for playing a

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significant role in the economy of the country. This study examined the impact of working capital management on profitability of cement companies listed in the Dhaka Stock Exchange for 2007-2015. The results show that for the cement industry, working capital management has significant impact on profitability. Cash conversion cycle, average collection period and inventory conversion period have significant negative impact on profitability. It suggests that managers can improve profitability by reducing the cash conversion cycle, by collecting receivables faster and by selling inventory sooner, respectively. Results also found a significant positive impact of payable deferral period on profitability implying managers can increase profitability by taking more time to pay the bills. Evidence suggests increase in leverage leads to decline in profitability.

This research can be further extended to identify the optimal level of cash conversion cycle and its components for cement companies that will generate the maximum profitability. Moreover, research could also be further extended to evaluate the trade credit policies practiced by the cement companies.

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