

The Relationship between Liquidity and Profitability in Emerging Countries: Evidence from Bangladesh

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Abstract The relationship between liquidity and profitability has become an important issue among any organization. It is all about managing current assets and current liabilities in such a way so as to maximize profitability. Liquidity is perceived as the debt paying ability of going concern. Hence, it is important to keep a constant eye on the liquidity position of the company as without it the company cannot survive. The concern of business owners and managers are to devise a strategy that will help maintain liquidity as well as to increase profitability. Liquidity and profitability are closely related because one increases, and the other decreases. This study aims to reveal the relationship between liquidity and firm's profitability by using the data of the cement industry listed on the Dhaka Stock Exchange Ltd in Bangladesh. Annual data of 6 out of 7 companies are used for the period 2013-2017 in the study. The relationship between liquidity and firm's profitability were examined by the Pearson's correlation analysis using the SPSS-23 version. The dependent variable is defined by net profit, return on assets and return on equity and the independent variables are the current ratio, quick ratio, and the cash conversion cycle. The results in the correlation matrix show the existence of the relationship between liquidity and profitability. The study found that the cash conversion cycle has a strong negative relationship with all profitability ratios (NPM, ROA, and ROE). Moreover, the study also observed that the liquidity ratio (CR, and QR) have positive relationship with all profitability ratios of the cement industry in Bangladesh.

Keywords: *liquidity and profitability, Return on Asset (ROA), Cash Conversion Cycle, DSE, Bangladesh*

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1. Introduction

The association between liquidity and profitability has been the interest of academicians for a long time. Liquidity management has become a crucial concept for every organization. The Liquidity refers to the solvency of the firm's overall financial position the case with which it can pay its bills. Because a common precursor to financial distress and bankruptcy is low or declining liquidity, these ratios can provide early signs of cash flow problems and impending business failure. The two basic measures of liquidity are the current ratio and the quick ratio. There are many measures of profitability such as gross profit margin, operating profit margin, and net profit margin, earnings per share, return on assets, and return on equity. Without profits, a firm could not attract outside capital. Owners, creditors, and managers pay close attention to boosting profits because of the great importance placed on earnings in the marketplace [1]. The short-term prospect of a company is judged by its liquidity because it defines the company's capability to pay its short-term debts [2]. Hence, it is important to understand the nature of liquidity and how it actually affects a company's profitability.

Liquidity is important for the short-term, the more liquid a company is, the lower the chance of it being unable to pay its short-term debts.

Therefore, a financial manager will try to balance between liquidity and profitability to give optimum return for its shareholders [3]. When there is poor management of working capital, funds can be unnecessarily tied up in idle assets. This will reduce liquidity of the company and also the company will not be in a position to invest in productive assets and plant machinery. It will also affect the profitability of the company [4]. In times of crisis, liquidity management has become even more important for every organization. According to [5] even in good times, liquidity management is important, and it becomes even more important in troubled times. Liquidity and profitability management are one of the important issues of the present world economy.

Liquidity measures the short-term ability of the company to pay its maturing obligations and to meet unexpected needs for cash and profitability measures the income or operating success of a company for a given period of time. Income, or the lack of it, affects the company's ability to obtain debt and equity financing [6]. The Liquidity contra Profitability Principle, there is a differentiation between liquidity and profitability; gaining

more of one ordinarily means concede some of the other. The liquidity as a determinant of profitability is similar to that considered in research on profitability which classified as management controllable internal determinants. This paper examines whether the liquidity has significant impact on Bangladeshi cement firm's profitability through return on asset (ROA) [7,8,9].

2. Research Objectives

The main objective of this paper is to identify the relationship between liquidity and profitability of the cement industry in Bangladesh. To achieve this objective, this study was carried out in the following section as follows: Section three review of the literature for the relevant theoretical work on the relationship between liquidity and profitability. Section four presents the methodology and framework which includes sample and the variables used in the analysis. Section five portrays and discusses the data analysis, discussion and statistical results. Section six presents the conclusion.

3. Literature Review

In the book "Total Management by Ratios" says that the problem of liquidity management is more acute for companies that are growing at a fast rate. The rising cash flow (Profit) curves gives a euphoric feeling of "all being well everywhere", which makes managers press the growth button faster. What they lose sight of is the real cash position of the company which might be showing a downward trend and hence, pushing the company slowly and vigorously towards a severe liquidity crisis despite the company making high profit [10].

In the study of "Management of Working Capital" revealed that investment in current assets was more than that of fixed assets and inventories constituted the highest percentage of total current assets. The study also found that the liquidity and solvency position of sample companies was found to be highly unsatisfactory. The study suggested the direct need for improvement of liquidity and solvency position of sample units failing which the situation would lead to serious liquidity crunch [11].

In the study of "Measuring Association between Working Capital and Return on Investment" evaluated the association between traditional and alternative working capital measures and return on investment, especially in industrial firms. The results of their study traditional working capital leverage ratio, current liabilities divided by funds flow displayed the greatest associations with return on investment. The well-known liquidity concepts such as the current and quick ratios registered insignificant associations whilst only one of the working capital concepts, the comprehensive liquidity index, indicated significant associations with return on investment [12]. The Merchandising Ratio: A Comprehensive Measure of Working Capital Strategy" argued that the management of receivables, inventories, and accounts payable has a tremendous impact on cash flows, which in turn affect the profitability of firms [13]. An Empirical Investigation in

an Emerging Market" in the study of liquidity and profitability trade-off examined the relationship between liquidity and profitability, as measured by current ratio and cash conversion cycle on a sample of joint stock companies in Saudi Arabia. The study revealed that there exists a significant negative relationship between the firm's profitability and its liquidity, as measured by the current ratio [5]. There is a negative relation between gross operating incomes on one hand, and the components of working capital management (accounts receivable in days, inventory in day's payable payment period, and cash conversion cycle) on the other hand. The fact is leading to another point which is the waiting time between the money spent on purchase of raw materials and the collection of sales of finished goods can be too long, and decreasing this waiting time will maximize profitability [14]. The relationship between working capital management and profitability of listed companies in the Athens Stock Exchange found that there was a statistically significant negative relationship between the cash conversion cycle and the gross operating profit, statistically significant negative relationships between the number of day's account payable and the gross operating profit, statistically significant negative relationship between the number of day's account receivable and the gross operating profit. The study also showed a highly significant negative relationship between profitability and the cash conversion cycle [15].

Maximizing profit with ignoring liquidity costs can cause serious problems to the firm. Hence, a firm must examine an equilibrium point between the liquidity and profitability using the three-component of the cash conversion cycle [16]. Managers can create value by reducing their inventories and the number of days for which their accounts are outstanding. Moreover, shortening the cash conversion cycle also helps improves the firm's profitability [17]. Fixed and current assets play a vital role, along with the proper management of working capital is essential as it has a direct impact on profitability and liquidity [18].

Working capital is not a factor of improving profitability and there may be a negative relationship between them, and investment in working capital plays a vital role to improve profitability unless there is a minimum level of investment of working capital, output and sales cannot be maintained-in fact the inadequacy of working capital would keep fixed asset inoperative [19].

In the relationship between the cash conversion cycle and profitability for the Malaysian firms for the 1999-2006 periods found a negative significant relationship between the cash conversion cycle and firm's profitability. This study revealed that reducing the cash conversion period results in increasing profitability [20]. A prior study on the relationship between working capital management and profitability in Brazilian listed companies showed negative relationship for return on assets and sales with day's inventory. It also found that return on assets has a negative relationship with debt ratio [21]. The study on the impacts of liquidity ratios on profitability found that there is a significant impact of only liquid ratio on ROA while insignificant on ROE and ROI; the results also revealed that ROE is not affected significantly by three ratios current ratio, quick ratio and

liquid ratios while ROI is greatly affected by current ratios, quick ratios and liquid ratio. The main results of the study explained that each ratio has a significant effect on the financial positions of enterprises with differing amounts and that along with the liquidity ratios in the first place. Profitability ratios also play an important role in the financial positions of enterprises [22]. The trends in liquidity management and their impact on profitability; a study on the great lakes herald found that company's always tries to maintain an adequate amount of net working capital in relation to current liabilities so as to keep a good amount of liquidity [23]. If managers consider the cash conversion cycle as an important ratio and use it for decision making it will improve the liquidity-profitability relationship better. Rather, more aggressive working capital helps decrease liquidity to the optimum level, if it is too high while representing conservative policy [24]. The "Trade-off between Liquidity and Profitability: A Study of Selected Manufacturing firms in Sri Lanka" found that there exists between CR and Profitability (NP, ROA, ROE) in a weak positive, and QR negatively correlated with all Profitability ratios and this also showed that the liquidity correlated profitability partially [25]. It is essential for every firm to maintain the equilibrium between liquidity and profitability as there is a negative relationship between liquidity and profitability [26].

In the study on the impact of liquidity on profitability for 10 listed IT companies of Poland for the 2003-2011 period found a statistically positive significant relationship of receivable collection period, and inventory conversion period with profitability [27]. While the another study on the 8 listed trading companies of Sri Lanka for the 2008-2012 periods found a significant relationship between liquidity and profitability. The study observed that the current ratio had a significant correlation with return on assets and return on equity and quick ratio was only significant with return on assets while liquidity ratio was insignificant with both of the return on assets and return on equity [28]. But in the study of liquidity –profitability relationship in Bangladeshi banking industry found no significant relationship between liquidity and profitability over the period [29] while [27] found a positive relationship of receivable collection, inventory conversion period with profitability such as return on assets (ROA), return on equity (ROE), and the return on sales (ROS).

A study of liquidity and profitability relationship on Indonesian capital market found negative relationship between liquidity and profitability in consumer goods and agriculture sectors; even though the relationship is proved to be weak and the cash conversion cycle and current ratio also have significant effect on profitability [30]. In the another study on the impact of liquidity on profitability measured through return on assets of Jordanian Banks listed at Amman Stock Exchange revealed that there was a significant impact of independent variable quick ratio on dependent variable return on assets. That means profitability through return on assets (ROA) is significantly influenced by liquidity through quick ratio [31].

Working capital management increases profitability, and hence a negative relationship exists between the

measure of working capital management (cash conversion cycle and profitability variable). If efficient working capital management increases profitability, one should expect a negative relationship between the measures of working capital management and profitability variable [32]. The study of liquidity and profitability trade-off in the Pharmaceutical and Chemicals sector of Bangladesh for the 2005-2014 periods found positive relation of CR and QR with ROA, ROE, and ROCE in the correlation matrix. But, in the regression analysis study found no significant association between liquidity and profitability [33]. The other study on the "Working Capital Management: A Measurement Tool for Profitability of the Pharmaceuticals Industries in Bangladesh" found a negative relationship between profitability and the cash conversion cycle [34]. In addition to that in the study on the effect of working capital management on profitability in emerging countries evidence from Turkey found a negative relationship between return on assets and the payables payment period, and the cash conversion cycle. While return on assets was positive relationship to inventory conversion period [35]. But by using the cash conversion cycle as an effect on firm's profitability in the Nigerian listed telecommunication companies observed a significant positive relationship between the cash conversion cycle and corporate profitability [36].

4. Research Methodology

4.1. Data Collection

To fulfill the objectives of this study, data were collected from the secondary source of information. The secondary data were collected from annual reports of six cement industries from out of seven listed in the Dhaka Stock Exchange Ltd. for the 2013-2017 period.

4.2. Method of Analysis

Statistical analyses are used to describe an account for the observed variability in the data. Here, the described statistics and inferential statistics have been used. The descriptive statistics summarized the behavior of the variables. The SPSS-23 version has been used to describe the descriptive statistics and provide detailed information about each relevant variable.

4.3. Research Model

The research model represents the relationship between dependent variable and independent variable. Here, the profitability (P) depends on Liquidity (L), thus, the P is the dependent variable and L is the independent variable and the independent variables are measured by the current ratio, quick ratio, and cash conversion cycle. The dependent variables are measured by net profit, return on assets, and return on equity. Therefore, the research model is given below:

$$P = \beta_0 + \beta_1 CR + \beta_2 QR + \beta_3 CCC + e$$

4.4. Research Variables

The variables that are used in this study are as follows: Current ratio (CR), Quick ratio (QR), Cash Conversion Cycle (CCC), Net profit margin (NPM), Return on assets (ROA), and Return on equity (ROE). The measures of liquidity are the current ratio, quick ratio and the cash conversion cycle. The cash conversion cycle has expressed as a unit of days and all other variables are expressed in terms of percentage or ratio. The variables and measurement of ratios are given in the Table 1 below:

Table 1. Variables and Measurement of Ratios

Variables	Measurement
Current Ratio(CR)	CA/CL
Quick Ratio(QR)	CA-INV./CL
Net Profit Margin(NPM)	NP/S
Return on Asset (ROA)	EBIT/ TA
Return on Equity (ROE)	EBIT/TA-TL
Cash Conversion Cycle(CCC)	ACP+ICP-PPP

The study intended to assess the relationship between liquidity and profitability of the cement industry in Bangladesh. The calculation of cash conversion cycle is described in detail by the following equation:

$$\text{Cash Conversion Cycle} = \text{ACP} + \text{ICP} - \text{PPP}$$

$$\text{Average Collection Period}$$

$$= \text{Accounts Receivable} / \text{Sales} * 365$$

$$\text{Inventory Conversion Period} = \text{Inventory} / \text{COGS} * 365$$

$$\text{Payables Payment Period}$$

$$= \text{Account Payable} / \text{COGS} * 365.$$

4.5. Conceptual Framework

The conceptual framework that has been used to understand and explain the relationship between liquidity and profitability is given below:

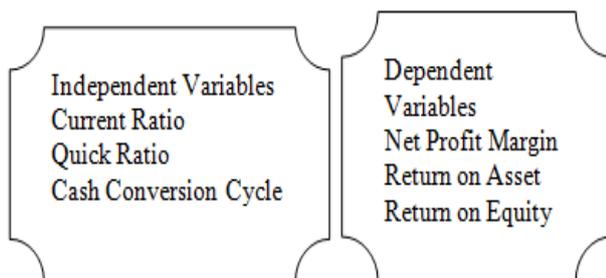


Figure 1. Conceptual Framework of the Study

The study makes a set of testable hypothesis (the null hypothesis (H0) and the alternative hypothesis (H1) to examine the relationship between liquidity and profitability.

H01: There is a positive relationship between CR and NPM

HA1: There is a negative relationship between CR and NPM

H02: There is a positive relationship between CR and ROA

HA2: There is a negative relationship between CR and ROA

H03: There is a positive relationship between CR and ROE

HA3: There is a negative relationship between CR and ROE

H04: There is a positive relationship between QR and NPM

HA4: There is a negative relationship between QR and NPM

H05: There is a positive relationship between QR and ROA

HA5: There is a negative relationship between QR and ROA

H06: There is a positive relationship between QR and ROE

HA6: There is a negative relationship between QR and ROE

H07: There is a positive relationship between NPM and CCC

HA7: There is a negative relationship between NPM and CCC

H08: There is a positive relationship between ROA and CCC

HA8: There is a negative relationship between ROA and CCC

H09: There is a positive relationship between ROE and CCC

HA9: There is a negative relationship between ROE and CCC.

5. Analysis and Findings

5.1. Descriptive Statistics

The descriptive statistics are illustrated on the Table 2 where the model variables are explained in terms of their mean, median, standard deviation, and standard error.

Table 2. Descriptive Statistics

	Mean	Median	Std. Deviation	Std. Error
CR	1.01	.94	1.99	.081
QR	.85	.79	.156	.063
NPM	5.40	5.7	2.99	1.22
ROA	3.47	3.17	1.99	.81
ROE	1.98	1.67	1.77	.72
CCC	145	129	82	33.76

The liquidity of the firms is measured by current and quick ratio. The mean and median of current and quick ratio are very close to each other, which indicate there exists high correlation between the two ratios. But the norms of current and quick ratio are 2:1 and 1.5:1, this show the lower efficiency to cover short-term obligations. The mean and median of net profit are more than of one and half times of ROA, which indicates firms are not using their total assets properly to generate more and more sales. The mean and median of return on equity is 1.98 and 1.67 respectively and standard deviation value is 1.77. Additionally, the cash conversion cycle shows that, it takes on an average 145 days (Median 129) to realize cash provided by the selling activities.

5.2. Correlation Result

This paper used the use of Pearson's correlation for the data to see the relationship between liquidity and profitability ratios. The relationship between liquidity and profitability ratios are presented in the [Table 3](#) given below:

Table 3. Correlation Analysis (Correlation between Liquidity and Profitability)

	CR	QR	NPM	ROA	ROE	CCC
CR	1					
Sig. (2-tailed)						
QR	.921	1				
Sig. (2-tailed)	.009					
NPM	.477	.345	1			
Sig. (2-tailed)	.338	.503				
ROA	.718	.582	.938	1		
Sig. (2-tailed)	.108	.226	.006			
ROE	.872	.780	.804	.928	1	
Sig. (2-tailed)	.023	.067	.054	.008		
CCC	-.563	-.466	-.628	-.633	-.793	1
Sig. (2-tailed)	.245	.351	.182	.177	.060	

*Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed).

From the [Table 2](#) it is observed that, the correlation coefficient between CR and NP is .477 and the P-value for two-tailed tests is .338 and greater than 0.05. Therefore, there is a moderate positive correlation between the current ratio and net profit margin and that this correlation is insignificant at a significant level of 0.05. The correlation coefficient between and ROA is .718 and the P-value for two-tailed tests is .108 that is greater than 0.05. Therefore, there is a strong positive correlation between current ratio and return on assets.

The correlation coefficient between the CR and ROE is .872 and the P-value for two-tailed tests is .023. So, there exists a strong positive correlation between CR and ROE. The correlation coefficient between QR and NPM is .345 and the value for two-tailed tests is .503 greater than 0.05. There is a weak positive correlation between the quick ratio and net profit margin and that this correlation is insignificant at the significant level of 0.05. The correlation coefficient between QR and ROA is .582 and the P-value for two-tailed tests is .226 greater than 0.05. There is a moderate positive correlation between quick ratio and return on assets and that this correlation is insignificant at a significant level of 0.05. The correlation coefficient between QR and ROE is .780 and the P-value for two-tailed tests is .067 greater than 0.05 there is a strong correlation between the quick ratio and return on equity and that this correlation is insignificant at the significant level of 0.05. Again, the correlation matrix shows that the cash conversion cycle has a strong negative relationship with all profitability ratios such as net profit margin (-.741), return on assets (-.858), and return on equity (-.940) which is like as the analysis of [\[15,37,38\]](#).

5.3. Hypothesis Testing

The study found that at 5% significant level, there are evidences of positive and negative relationship between liquidity and profitability variables studied over the period

in the cement industry of Bangladesh. The summary of hypothesis testing is presented in the [Table 4](#) below:

Table 4. Summary of Hypothesis Testing

No	Hypothesis	Decisions	Tool
H01	There is a positive relationship between CR and NPM	Accepted	Correlation
HA1	There is a negative relationship between CR and NPM	Rejected	Correlation
H02	There is a positive relationship between CR and ROA	Accepted	Correlation
HA2	There is a negative relationship between CR and ROA	Rejected	Correlation
H03	There is a positive relationship between CR and ROE	Accepted	Correlation
HA3	There is a negative relationship between CR and ROE	Rejected	Correlation
H04	There is a positive relationship between QR and NPM	Accepted	Correlation
HA4	There is a negative relationship between QR and NPM	Rejected	Correlation
H05	There is a positive relationship between QR and ROA	Accepted	Correlation
HA5	There is a negative relationship between QR and ROA	Rejected	Correlation
H06	There is a positive relationship between QR and ROE	Accepted	Correlation
HA6	There is a negative relationship between QR and ROE	Rejected	Correlation
H07	There is a positive relationship between NPM and CCC	Rejected	Correlation
HA7	There is a negative relationship between NPM and CCC	Accepted	Correlation
H08	There is a positive relationship between ROA and CCC	Rejected	Correlation
HA8	There is a negative relationship between ROA and CCC	Accepted	Correlation
H09	There is a positive relationship between ROE and CCC	Rejected	Correlation
HA9	There is a negative relationship between ROE and CCC	Accepted	Correlation

These hypotheses testing have been evolved based on the correlation analysis result that shows the relationship between the liquidity and profitability in the [Table 4](#) above.

6. Conclusion

This paper adds to existing literature such as [\[37,38\]](#) who found a negative relationship between the cash conversion cycle and profitability of the listed cement industry in Bangladesh for the 2005-2009, and 2010-2012 periods respectively. In addition to that, the conclusions are in confirmation with [\[3,5,14,16\]](#) who found a strong negative relationship between the components of the cash conversion cycle and profitability of the firm. This study through descriptive statistics and correlation matrix observed that there exists between liquidity (CR) and Profitability (NPM, ROA, and ROE) a moderate and strong positive relationship and QR (NPM, ROA, and ROE) in a weak, moderate and strong positive relationship respectively. Despite being that, the cash conversion cycle has a strong negative correlation with all profitability

ratios such as net profit margin (-.741), return on assets (-.858), and return on equity (-.940).

On the basis of the above analysis, the study concludes that these results can be strengthened if these firms properly manage their receivables, inventories, and payables in a proper way and this will ultimately help increase profitability of these firms. However, this paper also concludes that there is a statistically significant relationship between liquidity and profitability of the cement industries in Bangladesh.

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