Impact of Capital Structure on Profitability of Cement Industry in Bangladesh

Dr. Md. Abdullah Al Mamun[1*], Mohammad Hedayet Ullah[2] and Masud Rana[3]

ARTICLE INFO

ABSTRACT

Purpose: This paper seeks to unearth the impact of capital structure on the profitability of listed cement companies at the Dhaka stock exchange in Bangladesh. **Methodology:** Data have been collected from secondary sources for the 10 years from 2009-10 to 2018-19 to accomplish the objectives. Data gathered tabulated, categorized, arranged, and concluded the necessary calculation for the production of panel data to fulfill the purpose. The capital structure ratios, profitability, and multiple linear regressions have been used to analyze data with the help of IBM SPSS-21. Capital structure ratios are short-term debt to total assets (STDTA), long-term debt to total assets (LTDTA), total debt to total assets (TDTA), long-term equity debt (LTDEQ), and total equity debt (TDEQ) and are considered to be the independent variables. The return on total assets (ROA), return on equity (ROE) are selected as the profitability and used as a dependent variable

Findings: Results forced to conclude that short-term debt to total assets, long-term debt to total assets have a neagtive effect on the return on total assets. This implies that the company would reduce profits by accumulating more borrowed money. On the other hand, short-term debt to total assets, long-term debt to total assets have a positive influence and long-term equity debt have a negative impact on return on equity.

Limitations: The study is conducted based on secondary data. So the validity and reliability cannot be judged. There are 32 cement companies of Bangladesh of which only seven are listed so the availability of data scope of the study was narrow.

Practical Implications: This implies that the firm raises more borrowed capital will reduce profit. So the authorities should use debt judiciously.

Originality: Research indicates that profitable companies are less dependent on debt as their key funding choice. In the case of Bangladesh, a high proportion of the debt is covered by short-term debt.

1. Introduction

One of the major financial decisions is taken by the financial managers is the capital structure. Firms raise funds from internal and external sources. One of the external sources of financing is debt. Debt includes bonds, debentures, and term loans. Thus firm wishes to find an optimal mixture (Van Horne & Wachowicz, 2008). Choices identifying with financing the assets of a firm are essential in each business and the fund administrator is regularly trapped in the problem of what the ideal extent of debt and equity ought to be (Besley & Brigham, 2005). The choice is attributable to the necessity to maximize returns for organizations and conjointly attributable to the impact of the choice on the company's ability to take part in its competitive atmosphere. The requirement for choosing an appropriate capital structure comes from the way that it is normally more affordable to get debt financing contrasted with equity (Khan & Jain, 2008). When in doubt there ought to be an appropriate blend of debt and equity capital in financing the company's assets. Capital structure is normally intended to serve the benefit of the owners. The

---

* Corresponding Author

[1] Associate Professor, Department of Business Administration, Pabna University of Science and Technology, Pabna, Bangladesh, E-mail: mamunfin38@gmail.com

[2] Assistant Professor, Department of Finance, University of Rajshahi, Rajshahi, Bangladesh, E-mail: papul4848@gmail.com

[3] Assistant Professor, Department of Business Administration, Pabna University of Science and Technology, Pabna, Bangladesh, E-mail: masud7648@gmail.com

organizations, in this way, must be watchful to utilize such extent of the debt, the expense of which doesn't exceed the return on its venture, thus leaving a more prominent portion of profits for the investors. Such an investigation, we express as 'Capital Structure Analysis'. Deciding the best fit capital structure is significant for all companies. The suitable capital structure finds some kind of harmony between the risk and returns trying to amplify the return of the stock while limiting the expense of capital. Also, it likewise impacts the associations, risk profile capability and to get funding and its cost, versatility to financial and industrial downturns, and their normal rate of investment (Schall & Halley, 1991). There are several theories clarifying capital structure. However, they yet to discover an ideal capital structure for the firms. Better realization of the issue significant requirements viewing the origination of capital structure and its outcome on organization benefit. The present investigation is an endeavor to inspect the impact of capital structure on the profitability of the cement industry in Bangladesh for the time of ten years from 2009-10 to 2018-19.

1.1 Objectives of the Study

The focal point of this research is the effect of capital structure on the performance of the listed cement companies in Bangladesh.

  i. To present the capital of structure and profitability of the industry in the study period.
  ii. To reveal the impact of capital structure on overall financial performance.

2. Theoretical and Conceptual Framework

In a perfect market, the capital structure choices of a firm would not enhance or reduce the firm value, and this was shown by the 1958 Modigliani-Miller theorem (Modigliani and Miller, 1958). Modigliani and Miller thus assumed that the funding plan would have no impact on the value of the company under the following circumstances: (i) no taxes, (ii) bankruptcy would not bear the company's real litigation costs or the prestige costs for its directors, (iii) ideal capital markets, that is, they are competitive, no friction and no details. Later, Modigliani and Miller (1963) also assume that the value of the firm should be improved by taxes. To form the optimal capital structure, the financial manager must give careful attention; this would lower-cost fund to accomplish the objective of optimizing wealth.

The cost of financial distress and agency costs are the two most significant aspects of the trade-off theory. Kraus and Litzenberger (1973) explained that "optimal leverage offers a trade-off between the tax advantages of debt and the costs of bankruptcy," which is a classic argument of trade-off theory. The theory suggests that you will benefit from leverage within a capital structure before you choose the appropriate capital structure for you. It is possible to achieve optimal structure. The theory takes into account the tax benefits of interest payments. The goal of the trade-off theory is to understand why firms are traditionally partly funded with debt and partially financed with equity.

Myers (1984), inspired by Myers and Majluf's (1984) adverse selection model, proposed the theory of hierarchical order. According to the theory, companies prefer to use internal financing (such as retained earnings or excess liquid assets) over external financing. If internal funds are insufficient to fund investment opportunities, a company can seek external financing but will select from a variety of external sources to keep costs down.

Baker and Wurgler (2002) highlighted another aspect of capital structure, namely the theory of market timing. In the market timing theory, they claimed that companies issue fresh stocks when stock prices are overvalued and buy back stocks when they are undervalued. As a result, changes in share prices influence the capital structures of the company. In general, companies do not care whether they finance with debt or with stocks; they simply choose the type of financing that, at that moment, it seems to be more valued by the financial markets.

Even though several theories have been established to understand how businesses can organize their finances, there is still no consensus theory that managers can use to determine the optimal capital structure. There have been several writers who affirm (Myers, 1984; Rajan & Zingles, 1995; Shyam, 1999; Fama, 2002; Huang & Song 2006; Tang & Jang 2007 that an ideal capital structure will decrease the cost of capital according to the principle of static

rewards that will offset advantages such as tax shields and hence the expense of financial distress. The firm valuation will improve due to reduced capital costs by using this optimal capital structure (Tang & Chang, 2007; Karadeniz, Kandir, Balcilar & Onal, 2009). The theory of pecking order does not mean debt or optimum capital structure (Myers & Majluf, 1984). The firm value will improve due to reduced capital costs using this optimal capital structure (Tang & Chang, 2007; Karadeniz, et.al. 2009). Pecking order theory does not mean leverage or an optimal structure of resources (Myers & Majluf, 1984). Based on the financing requirements, define each company to choose the leveraging ratio. Two rules are also revealed in the Pecking Order theory: (i) use internal financing and (ii) safety first (Ross, Westerfield & Jordan, 2008). If the company's financial structure influences outcomes, it is natural that the company's capital structure is likely to impact the company's stability and the risk of default. Therefore, having a transparent understanding of the capital structure and efficacy of the organization is of considerable value to researchers and practitioners. The organization's performance is estimated by factors that mean efficiency, profitability, growth, etc. There are several studies on the role of capital on profitability undertaken by scholars. Their effects were mixed. It indicates that the composition of capital can have a favorable or negative effect on financial outcomes.

Capital structure is the proportionate relationship of debt and equity used by a firm to finance its assets. As the firm increases the amount of debt cost of financing increases. On the other hand, the chance of receiving a return for shareholders dwindled. But interest on the debt is tax-deductible. Due tax-deductibility of interest on debt reduces the cost of debt and the possibility of not receiving earning by the shareholders in cost of equity. Ultimately the cost capital changes due to changes in the use level of debt. Several studies were made by different researchers on this topic. The conceptual framework of the study is that short term debt to total assets (STDTA), long term debt to total assets (LTDTA), total debt to total assets (TDTA), long term debt to equity (LDEQ), and Total debt to equity (TDEQ) risk perception of the shareholder and cost of capital ultimately affect the profitability.
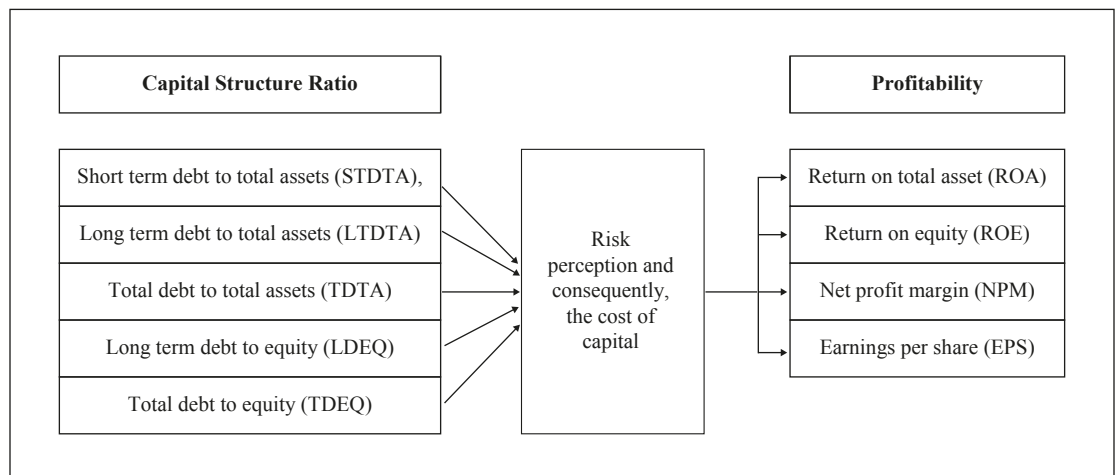

Figure 1. Conceptual Framework. Source: Developed by Authors

3. Literature Review

The capital structure has indeed the top most interest of academics, practitioners, and the business world. Much research has been carried out in this field to determine the impact of capital structure on a firms' profitability. The following section presents some of the major studies conducted by different researchers to develop a clearer understanding of the available literature on the effect of capital structure and profitability.

The impact of the capital structure on profitability and the empirical analysis of the listed companies in Ghana were analyzed by Abor (2005). To do so, for five years from 1998 to 2002, the researcher collected secondary data from all firms listed on the Ghana Stock Exchange. The investigator analyzed data and applied regression to panel data by leverage ratio. Short-term debt to total capital, long-term debt to total capital, and long-term debt to total capital are included in the leverage ratio. These debt ratios were used as independent variables in the regression

analysis and return on equity as dependent variables. He found that there is a negative association between short-term debt to the total asset and return on equity and a favorable relationship between long-term debt to the overall asset and return on equity.

Namalathasan (2010) has attempted to describe the influence of the capital structure on the viability of Srilanka's listed manufacturing companies. For the five years from 2003 to 2007, it gathered secondary data from all entities listed as manufacturing firms. The author evaluated data on panel data through leverage ratio and applied regression. The leverage ratio includes the equity of the loan, the ratio of capital gearing, the ratio of interest coverage, and the ratio of debt to the asset. He used these debt ratios in regression analysis as independent variables and gross profit ratio, operating profit ratio, net profit ratio, return on employed capital, and return on investment as contingent variables and profitability. He found that the debt-to-asset relationship between the net profit ratio, the operating profit ratio, and the return on capital employed was strongly positive.

Gill, Biger, and Mathur (2011) have concluded a study entitled Capital Structure Impact on US Business Profitability Facts. To carry out the report, researchers gathered secondary data on 272 US service and manufacturing companies listed on the New York Stock Exchange for 3 years from 2005 to 2007. On collected data, they conducted correlation and regression analysis. They found that there is a favorable association in the service sector between short-term debt to gross assets and return on equity. They also found that in the automotive sector, short-term debt to total assets, long-term debt to total assets, total debt to total assets had a favorable relationship to return on equity.

The effect of the capital structure on the viability of the manufacturing companies listed on the Amman Stock Exchange was discussed by Shubita and Alsawalhah (2012). The findings show substantially negative associations between debt and benefit by applying similarities and multiple regression analysis. This suggests that profitable businesses rely more on equity as their primary financing. Nevertheless, supportive results are advised to improve those variables, just as the organization should be using the optimal capital structure.

Salim and Yadav (2012) analyzed the impact of the capital structure on Malaysian firms' proof of business success. They gathered data on 236 companies listed on the Malaysian stock exchange bursa for the period 1995 to 2011. They developed panel results for regression analysis in which short-term debt; long-term debt and overall debt were taken as dependent variables by independent variables and earnings per share, return on equity, total asset return, and Tobin's Q. They find that short-term debt, long-term debt, and overall debt had major negative associations with earnings per share, return on equity, and return on total assets.

Chisti, Ali, and Sangmi, (2013) published a report entitled the effect of the capital system on India's proof of profitability. To carry out the study, researchers accumulated secondary data from 10 automotive companies over five years from 20057-08 to 2011-12. Including capital structure ratio and gross profit ratio, operating profit ratio, net profit ratio, return on capital working, and return on assets, they used debt to asset ratio, debt to equity ratio, and interest coverage ratio as profitability. On collected data, they conducted correlation and regression analysis. They noticed that there is a negative association between the ratio of debt to equity and profitability. They also found that the ratio of debt to assets and interest coverage ratio has a favorable association with India's automotive profitability sector.

Addae, Baasi, and Hughes (2013) addressed the effect of the capital structure on the viability of listed companies in Ghana. To examine the impact, they collected secondary data for 5 years from 35 listed firms. They used equity return as a dependent variable and short-term debt, long-term debt, and the percentage of overall debt capital structure. They used multiple linear regressions to derive the inferences. They find that the association between long-term debt, overall debt, and profitability is strongly negative. On the opposite, a strong positive association between short-term debt and profitability was also noticed by the researchers.

Research has been undertaken by Tailab (2014) on the impact of the capital structure on the viability of American energy companies. To conclude the analysis, he gathered secondary data for the nine years from 2005 to 2013 from 30 American energy companies. To observe the capital structure and return on net assets and return on equity as profitability, he used financial details for short-term debt, long-term debt, total debt, debt to equity. To

analyze the effect of the capital structure on profitability, he also used partial regression analysis. He saw that the return on equity (ROE) and return on investment had a substantially negative impact on overall debt (ROA). The investigator also found that short-term debt has a major positive impact on return on equity (ROE).

Hasan, Ahsan, Rahman, and Alam (2014) explored the effect of the capital system on Bangladesh's corporate efficiency. For the period 2007 to 2012, the authors gathered secondary data from 36 Bangladeshi companies listed on the Dhaka stock exchange. In panel regression analysis, the capital structure ratios used are short-term debt, long-term debt, and overall debt as independent variables and earnings per share, return on equity, total asset return, and Tobin's Q as contingent variables. They find that the arrangement of capital has a detrimental influence on profitability.

In his report, Ahmad (2014) attempted to describe the effect of the capital structure on the viability of Pakistan's cement market. He used secondary data from his analysis of 16 listed cement firms over 6 years from 2005 to 2010. Like debt-equity ratio, debt ratio, interest coverage ratio, short-term debt to assets, and long-term debt to assets and return on equity as profitability, the researcher used five debt ratios. He used a regression model of fixed and unpredictable impacts. The investigator agreed that short-term debt had a significant beneficial association with profitability. Besides, he found long-term debt, which had a major negative association with profitability.

Rouf (2015) confronted research work to examine the effect of the capital structure of non-financial companies listed on the Dhaka stock exchange on the business results (DSE). The purpose of this inquiry is to investigate the relation between the capital structure attribute and the output of the company measured by Assets (ROA) and Revenues (ROS). In his study, he used non-financial firms with secondary data from 2008 to 2011. Several regression models were used to quantify the effect of the capital structure on company performance, and the capital structure was calculated by the debt-to-equity ratio, the debt-to-equity ratio, the current debt-to-equity ratio, the equity-to-equity ratio, and the fund's ratio of current asset owners. The findings obtained from the regression models indicate that there is a negative and substantial relationship between the leverage ratio, the debt-to-equity ratio, and the equity holding ratio with the return on assets (ROA) and the return on revenue.

In his study, Hossain (2016) tried to work out the effects of capital structure and managerial ownership on the viability of Bangladesh's manufacturing companies. From 2002 to 2014, he used secondary data from 81 industrial companies for 13 years. The researcher used capital structure ratios as profitability ratios called the short-term debt ratio, long-term debt ratio, gross debt ratio and return on equity, and return on total assets. For certain control variables, he used multiple linear regression analyses of dependent and independent variables. The findings showed that the capital structure's impact on the return on assets was negative and the return on equity was good.

In his article, Anowar (2016) decided to report the impact of the capital structure on corporate performance. Between 1998 and 2013, he compiled secondary data on 40 listed companies on the Dhaka stock exchange. He used the Granger Causality Test. He finds that businesses tend to use their own money in the short term. He also found that the composition of capital affects profitability.

Khatoon and Hossain (2017) tried to examine in their research the relationship between the capital structure and the profitability of the cement companies listed in Bangladesh. They used secondary data in their study from 5 listed cement companies over the period from 1999 to 2011. Including short-term debt to current assets, long-term debt to total assets, total debt to total assets, long-term debt to equity, gross debt to equity, five leverage ratios were included. The return on gross assets, the return on equity, the net profit margin, and earnings per share are the profitability measures. They used a regression model of fixed effects. They found that short-term debt and profitability had a noticeable beneficial relationship. Moreover, they observed that there was a substantial negative association with profitability between long debt, asset tangibility, and liquidity.

Research to expose the effect of the capital system on profitability was completed by Rahman, Sarker & Uddin (2019). They received information from their audited financial statements from 10 manufacturing companies for the length of the 2013-2017 periods. Researchers have analyzed the composite statistics by leverage ratio, debt-to-equity ratio, debt-equity ratio, etc. The panel data linear regression analysis was done by them. The result of this study was that there was a favorable association between the leverage ratio and the debt-to-equity ratio and financial efficiency. However, the debt-equity ratio had a major adverse profitability effect.

Chang, Batmunkh, Wong and Jargalsaikhan (2009) have discussed the relationship between the capital structure and the viability of four Asian tigers. The writers gathered secondary data for 14 years between 2003 and 2016 from the related sector and companies. They used gross debt to total assets in the panel regression study as a measure of capital structure and return on total assets as profitability. They found that there is a major negative relationship between the arrangement of capital and profitability.

From the above literature, it is seen that a few studies have been conducted of this industry on the current topic. So it is the chance to explore the impact of capital structure on the profitability of the cement industry in Bangladesh.

3.1 Hypotheses of the Study

Based on the theoretical foundation and previous study the following hypothesis have been formulated for the present study,

> H_0**:** *There is no significant impact of capital structure on profitability.*
> H_1**:** *There is a significant impact of capital structure on profitability.*

4. Methodology

The methodology of the study covers sample selection, data collection, variable definition (dependent and independent) and regression model, and problems of data measurement.

4.1 Sample Selection:

There is seven cement manufacturing company listed in Dhaka stock exchange. To analyze the impact of capital structure on profitability all listed cement companies have been selected for the study. A period of 10 years has been chosen for the present study from 2009-10 to 2018-19 to detect the impact of capital structure on profitability. The purposive sampling technique has been used here to conduct the research.

4.2 Data Collection:

The sources of data may be primary or secondary. The present study covers all the secondary data collected from the audited annual reports of the selected company and their websites. The secondary data were tabulated and labeled according to the required form panel and to run multiple linear regressions.

4.3 Dependent Variable:

The financial performance of a business entity is measured by the ratio of profitability. Several investigations have been carried where researchers have taken various profitability indicators, such as Gill et al. (2011) return on equity, Rouf (2015) return on assets (ROA), return on revenue (ROS), Hasan et al. (2014) earnings per share, return on equity, return on assets Khatoon and Hossain (2017) return on total assets and return on equity. To ensure consistency with Khatoon and Hossain (2017, p.32) return on total assets are return on equity are taken as a profitability ratio and are used as a dependent variable.

4.4 Independent Variable:

Independent variables are which are used to get an idea of level debt financing. To stay consistent with Khatoon and Hossain (2017), Ahmad (2014), and Salim & Yadav (2012), thecapital structure ratios are short term debt to total assets (STDTA), long term debt to total assets (LTDTA), total debt to total assets (TDTA), long term debt to equity (LDEQ), and total debt to equity (TDEQ). Additionally natural log of sales used as firm size.

Regression models are as follows

$$ROE_{it} = \beta_0 + \beta_1 STDTA_{it} + \beta_2 LTDTA_{it} + \beta_3 TDTA_{it} + \beta_4 LTDEQ_{it} + \beta_5 TDEQ_{it} + \beta_6 SIZE_{it} + e_{it} \qquad (1)$$

$$ROA_{it} = \beta_0 + \beta_1 STDTA_{it} + \beta_2 LTDTA_{it} + \beta_3 TDTA_{it} + \beta_4 LTDEQ_{it} + \beta_5 TDEQ_{it} + \beta_6 SIZE_{it} + e_{it} \qquad (2)$$

4.5 Problems of Data Measurement

From the list of independent variables, we have seen six variables are taken to get a glimpse of the impact of capital structure on profitability. From the table. 8 (appendix) it is observed that the correlation coefficient of short-term debt to total assets and total debt to total assets is 0.945. It is also seen that the correlation coefficient of long-term debt to equity and total debt to equity is 0.975. Since the correlation coefficient of independent variables greater than 0.70, implies multicollinearity between independent variables (Molala, 2019). Here we have to sacrifice two variables out of these four. For the analysis we have used short term debt to total assets (STDTA), long term debt to total assets (LTDTA), and long term debt to equity (LTDEQ) as explanatory variables and sacrificed total debt to total assets (TDTA) and total debt to equity (TDEQ) for further study. Autocorrelation would be detected by the Durbin Watson test. DW values of below 1 or more than 3 are a cause for concern (Alsaeed, 2006). The multicollinearity of the independent variables judged by tolerance and variance inflating factors. If the tolerance greater than 0.10 (Menard, 1995) or Variance inflating factor (VIF) less than 10 implies no multicollinearity (Marquardt, 1970).

5. Results and Discussion

5.1 Descriptive Statistics

The following table (Table 1) illustrates the descriptive statistics for the relevant variables included in the study. It includes the minimum, maximum, mean, and standard deviation of each variable. The proportion of short-term debt to total assets ranges from 13 percent to 89 percent, with a mean of 46.17 percent, in addition to a 19.08 percent standard deviation. In the cement industry, long-term debt to total assets varies from 1 percentage to 28 percent, with an average of 11.90 percent. The proportion of long debt to equity spans from 0 percent to 13.89 percent. It reveals that the cement industry relies aggressively on short-term financing instead of long-term financing. The average return on total assets is 5.17 percent with a standard deviation of 4.89 percent. The table also reflects an average return on equity of 1.07 percent, extending from -609.79 percent to 75.971 percent. The profitability of the industry is seen as being unstable in terms of return on equity in the study period.

Table 1. Descriptive Statistics

Particulars	N	Minimum	Maximum	Mean	Std. Deviation
Short Term Debt to Total Assets	70	.13	.89	.4617	.19083
Long Term Debt to Total Assets	70	.01	.28	.1190	.06849
Long Term Debt to Equity	70	.00	13.89	.5276	1.71991
Firm Size	70	8.76	10.25	9.6934	.38528
Return on Total Assets	70	-9.15	14.80	5.1727	4.89421
Return on Equity	70	-609.79	60.03	1.0714	75.97168

Source: Output from SPSS-21 Analysis

5.2 Regression Results

The following tables are showing the empirical results of regression analysis. Regression analysis is used to identify the effect of debt financing on profitability. The return on equity is used as a dependent variable in the first regression model (equation:1). The following table (Table 3) shows that the F ratio is 467.822, which is significant at a probability of 0.000. Indicating that the model is statistically significant. The table also discloses that $r^2 = 0.966$ and adjusted $r^2 = 0.964$, respectively. It indicates that short-term debt to total assets, long-term debt to total assets, and long-term debt to equity explain 96.60 percent variability return on equity. The value of the coefficients and their probabilities (Table 4) are short-term debt to total assets ($\beta = 45{,}967$, $p = 0{,}000$), long-term debt to total assets ($\beta = 143{,}566$, $p = 0{,}000$), and long-term debt to equity ($\beta = -46{,}030$, $p = 0{,}000$), firm size $\beta = -2{,}801$, $p = 0{,}588$).

The results lead us to accept the alternative hypothesis. This states that there is a positive influence of short-term debt to total assets, long-term debt to total assets on return on equity, the same result found by (Abor, 2005) and (Yegon et al., 2014). The long-term debt to equity shows a significant negative relationship to return on equity-like (Ahmed, 2014). But there is no significant relationship with the size of the company.

Table 2. Model Summary of a Regression Equation (1)

Model	R	R Square	Adjusted R Square	Std. The error of the Estimate	Durbin-Watson
3	.983[a]	.966	.964	14.34139	2.039
a. Predictors: (Constant), Firm Size, Long Term Debt to Total Assets, Long Term Debt to Equity, Short Term Debt to Total Assets					
b. Dependent Variable: Return on Equity					

Source: Output from SPSS-21 Analysis

Table 3. ANOVA of a Regression Equation (1)

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	384878.139	4	96219.535	467.822	.000[b]
	Residual	13368.904	65	205.675		
	Total	398247.043	69			
a. Dependent Variable: Return on Equity						
b. Predictors: (Constant), Firm Size, Long Term Debt to Total Assets, Long Term Debt to Equity, Short Term Debt to Total Assets						

Source: Output from SPSS-21 Analysis

Table 4. Regression Coefficients of Equation (1)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
3	(Constant)	14.202	52.215		.272	.786		
	Short Term Debt to Total Assets	45.967	11.105	.115	4.139	.000	.664	1.507
	Long Term Debt to Total Assets	143.566	25.805	.129	5.564	.000	.954	1.048
	Long Term Debt to Equity	-46.030	1.113	-1.042	-41.352	.000	.813	1.230
	Firm Size	-2.801	5.147	-.014	-.544	.588	.758	1.319
a. Dependent Variable: Return on Equity								

Source: Output from SPSS-21 Analysis

In the second regression model (equation: 2) return on total assets has been used as the dependent variable. The following table (Table 6) reveals that the F ratio is 18.187 which is significant at a probability of 0.000. The outcomes indicate that the model is statistically significant. The result also indicates (Table 5) that $r^2 = 0.528$ and adjusted $r^2 = 0.499$ are respectively. It means that 52.80 percent of the variability of the return on total assets explained by short-term debt to total assets, long-term debt to total assets. The value of the coefficients and their probabilities (Table 7) are short-term debt to total assets ($\beta = -10.387$, $p = 0.000$), long-term debt to total assets ($\beta = -31.946$, $p = 0,000$) and long-term debt to equity ($\beta = -0.378$, $p = 0.165$), firm size $\beta = 1.160$, $p = 0.354$). Findings urge us to accept the alternative hypothesis. Results show that the short-term debt to total assets, long-term debt to total assets have a significant negative impact on return on total assets. The finding is similar to (Hossain, 2016; Rajan & Zingales, 1995; Zetun & Tian 2007; Addae, Baasi, & Hughes 2013; and Abor 2007). The long-term equity debt displays an insignificant negative return on total assets. But there is no significant relationship with the size of the company.

Table 5. Model Summary of a Regression Equation (2)

Model	R	R Square	Adjusted R Square	Std. The error of the Estimate	Durbin-Watson
4	.727[a]	.528	.499	3.46387	2.026
a. Predictors: (Constant), Firm Size, Long Term Debt to Total Assets, Long Term Debt to Equity, Short Term Debt to Total Assets					
b. Dependent Variable: Return on Total Assets					

Source: Output from SPSS-21 Analysis

Table 6. ANOVA of a Regression Equation (2)

Model		Sum of Squares	Df	Mean Square	F	Sig.
4	Regression	872.881	4	218.220	18.187	.000[b]
	Residual	779.897	65	11.998		
	Total	1652.777	69			
a. Dependent Variable: Return on Total Assets						
b. Predictors: (Constant), Firm Size, Long Term Debt to Total Assets, Long Term Debt to Equity, Short Term Debt to Total Assets						

Source: Output from SPSS-21 Analysis

Table 7. Regression Coefficients of Equation (2)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
4	(Constant)	2.730	12.611		.216	.829		
	Short Term Debt to Total Assets	-10.387	2.682	-.405	-3.873	.000	.664	1.507
	Long Term Debt to Total Assets	-31.946	6.233	-.447	-5.126	.000	.954	1.048
	Long Term Debt to Equity	-0.378	.269	-.133	-1.405	.165	.813	1.230
	Firm Size	1.160	1.243	.091	.933	.354	.758	1.319
a. Dependent Variable: Return on Total Assets								

Source: Output from SPSS-21 Analysis

6. Conclusion

This study explores the influence of the capital structure on the profitability of the listed (DSE) cement companies in Bangladesh. The profitability parameter used here is the return on total assets (ROA), return on equity (ROE), and the capital structure ratios are a short-term debt to total assets, long-term debt to total assets, and long-term debt to equity. Empirical findings suggest that short-term debt to total assets, long-term debt to total assets, have a negative effect on the output of companies calculated by return on total assets. These suggested that the success of the organization is negatively linked to the structure of capital. This means that the rise in debt levels would minimize the company's return or vice versa. In short, it is possible to state that short-term debt is a more preferable form of funding for productive businesses. Excessive use of short-term debt increases the risk of financial instability and even failure, leading to increased short-term debt costs. The study reveals that short-term debt to total assets, long-term debt to total assets have a positive effect on return on equity, and long-term debt to equity has a significant negative effect on the profitability of businesses. The results also showed that long-term debt has a negative influence on the profitability of firms since it can be more expensive than short-term debt. Therefore, similar studies should analyze the influence of the capital structure on the overall performance of the organization.

References

Abor, J. (2005). The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana. *The Journal of Risk Finance*, 6(5), 438-445.

Addae, A. A., Nyarko-Baasi, M., & Hughes, D. (2013). The effects of capital structure on profitability of listed firms in Ghana. *European Journal of Business and Management, 5*(31), 215-229.

Ahmad, T. (2014). Impact of capital structure on profitability: an empirical analysis of cement sector of Pakistan. *Research Journal of Finance and Accounting, 5*(17), 49-54.

Alsaeed, K. (2006). The association between firm-specific characteristics and disclosure: the case of Saudi Arabia. *Managerial Auditing. 21*(5), 476-496.

Anowar, Z. (2016). Capital structure and profitability of Bangladeshi firms: A causal investigation. Universal *Journal of Accounting and Finance, 4*(4), 130-35.

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *The journal of Finance, 57*(1), 1-32.

Besley, S., & E. Brigham, 2005, *Essentials of managerial finance*, 13th ed, Thomson Southwestern, Inc.

Chang, C. C., Batmunkh, M. U., Wong, W. K., & Jargalsaikhan, M. (2019). Relationship between capital structure and profitability: Evidence from four Asian tigers. *Journal of Management Information and Decision Sciences, 22*(2), 54-65.

Chisti, K. A., Ali, K., & Sangmi, M. I. D. (2013).Impact of capital structure on profitability of listed companies (evidence from India). *The USV Annals of Economics and Public Administration, 13*(1) 183-191.

Fama, E., & French, R. K. 2002. Testing trade-off and pecking order predictions about dividends and debt, *The Review of Financial Studies 15*(1), 1-33.

Gill, A., Biger, N., & Mathur, N. (2011). The effect of capital structure on profitability: Evidence from the United States. *International Journal of Management, 28*(4), 3-15.

Hasan, M. B., Ahsan, A. M., Rahaman, M. A., & Alam, M. N. (2014). Influence of capital structure on firm perfor mance: Evidence from Bangladesh. *International Journal of Business and Management, 9*(5), 184.

Hossain, I. (2016). Effects of Capital structure and managerial ownership on profitability: Experience from Bangladesh. *International Journal of Business and Management, 11*(9), 218.

Huang, S., & Song, F. 2006. The determinants of capital structure: evidence from China,*China Economic Review, 17*(1), 14- 36.

Karadeniz, E., Kandir, Y. S., Balcilar, M. & Onal, B. Y., 2009. Determinants of capital structure: evidence from *Turkish lodging companies. International Journal of Contemporary Hospitality Management 21*(5), 594-609.

Khan, M. Y., & Jain, P. K. (2008). *Financial Management: Text, Problems and Cases*, McGraw-Hill Education. India.

Khatoon, T., & Hossain, M. (2017). Capital structure and firm's financial performance: Evidence from listed cement companies of Dhaka stock exchange of Bangladesh. *International Journal of Business and Statistical Analysis, 4*(1), 29-37.

Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance, 28*(4), 911-922.

Marquardt, D. W. (1970). Generalized inverses, ridge regression, biased linear estimation, and nonlinear estimation. *Technometrics* 12, 591–256.

Menard, S. (1995). *Applied logistic regression analysis: Sage university series on quantitative applications in the social sciences.* Thousand Oaks, CA: Sage.

Modigliani, F. F., & Miller, M. H. (1963). Corporation income taxes and the cost of capital: a correction. *American Economic Review, 53*(3), 433–443.

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment, *American Economic Review 48*(3), 261-297.

Molala, R. (2019, July). *Correlation and Collinearity - How they can make or break a model*. Accessed on December 14, 2020, from https://blog.clairvoyantsoft.com/correlation-and- collinearity-how-they-can-make-or-break-a-model-9135fbe6936a.

Myers, S. (1984). The Search for Optimal Capital Structure. *Midland Corporate Finance Journal 1*(1), 6-16.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics 13*(2), 187- 221.

Namalathasan, B. (2010). Capital Structure and its Impact on Profit Ability: A Study of Listed Manufacturing Companies in Srilanka. *Ekonomika, Journal for Economic Theory and Practice and Social Issues, 56*, 83-92.

Rahman, M. A., Sarker, M. S. I., & Uddin, M. J. (2019). The impact of capital structure on the profitability of publicly traded manufacturing firms in Bangladesh. *Applied Economics and Finance, 6*(2), 1-5.

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance, 50*(5), 1421-1460.

Rouf, D. (2015). Capital structure and firm performance of listed non-financial companies in Bangladesh. The *International Journal of Applied Economics and Finance, 9*(1), 25-32.

Ross, S. A., Westerfield, R., & Jordan, B. D. (2008). *Fundamentals of corporate finance*. Tata McGraw-Hill Education.

Salim, M., & Yadav, R. (2012). Capital structure and firm performance: Evidence from Malaysian listed companies. *Procedia-Social and Behavioral Sciences, 65*, 156-166.

Schall, L. D., & Charles, W. Halley, 1991, *Introduction to financial management*. McGraw Hill.

Shubita, M. F., & Alsawalhah, J. M. (2012). The relationship between capital structure and profitability. *International Journal of Business and Social Science, 3*(16).104-112.

Shyam-Sunder, L., & Myers, S. C. (1999). Testing static tradeoff against pecking order models of capital structure. *Journal of Financial Economics, 51*(2), 219-244.

Tailab, M. (2014). The effect of capital structure on profitability of energy American firms. *International Journal of Business and Management Invention, 3*(12).54-61.

Tang, C. H. H., & Jang, S. S. (2007). Revisit to the determinants of capital structure: A comparison between lodging firms and software firms. *International Journal of Hospitality Management, 26*(1), 175-187.

Van Horne, J. C., & Wachowicz, J. M. (2008). *Fundamentals of financial management*. Pearson Education.

Yegon, Charles, Cheruiyot, Joseph, Sang, J., & Cheruiyot, P. (2014). The Effects of Capital Structure on Firm's Profitability: Evidence from Kenya's Banking Sector. *Research Journal of Finance and Accounting, 5*(9), 152-159.

Zeitun, R., & Tian, G. G. (2014). Capital structure and corporate performance: evidence from Jordan. *Australasian Accounting Business & Finance Journal. 1*(4), 40-61.

Appendices

Table 8. Correlation Matrix

		Short Term Debt to Total Assets	Long Term Debt to Total Assets	Total Debt to Total Assets	Long Term Debt to Equity	Total Debt to Equity	Firm Size	Return on Total Assets	Return on Equity
Short Term Debt to Total Assets	Pearson Corr.	1							
	Sig. (2-tailed)								
	N	70							
Long Term Debt to Total Assets	Pearson Corr.	.097	1						
	Sig. (2-tailed)	.426			.				
	N	70	70						
Total Debt to Total Assets	Pearson Corr.	.945**	.416**	1					
	Sig. (2-tailed)	.000	.000						
	N	70	70	70					
Long Term Debt to Equity	Pearson Corr.	.405**	.188	.431**	1				
	Sig. (2-tailed)	.001	.119	.000					
	N	70	70	70	70				
Total Debt to Equity	Pearson Corr.	.371**	.018	.344**	.975**	1			
	Sig. (2-tailed)	.002	.883	.004	.000				
	N	70	70	70	70	70			
Firm Size	Pearson Corr.	-.484**	.039	-.432**	-.200	-.187	1		
	Sig. (2-tailed)	.000	.750	.000	.098	.121			
	N	70	70	70	70	70	70		
Return on Total Assets	Pearson Corr.	-.546**	-.508**	-.664**	-.399**	-.295*	.297*	1	
	Sig. (2-tailed)	.000	.000	.000	.001	.013	.013		
	N	70	70	70	70	70	70	70	
Return On Equity	Pearson Corr.	-.287*	-.056	-.280*	-.968**	-.981**	.143	.355**	1
	Sig. (2-tailed)	.016	.645	.019	.000	.000	.238	.003	
	N	70	70	70	70	70	70	70	70
**. Correlation is significant at the 0.01 level (2-tailed).									
*. Correlation is significant at the 0.05 level (2-tailed).									