

THE IMPACT OF FINANCIAL STRUCTURE ON PROFITABILITY: A STUDY ON BANGLADESH'S CEMENT SECTOR

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Abstract

Despite of substantial theoretical developments in the field of corporate finance over the past several decades, the rift between theory and practice still needs to be reconciled. This paper is an effort to investigate the relationship between capital structure and the profitability of cement sector of Bangladesh, by using panel data extracted from the financial statements of the companies listed on the Dhaka Stock Exchange. This paper is based on the both ratio analysis and statistical analysis. Profitability and leverage ratios are used for the analysis. Linear regression model is used to investigate the nature of relationship between Capital Structure and profitability. The rationale behind the industry specific analysis is the fact that exogenous variables appear to force firms in the same industry in similar fashion, thus leading to the existence of an industry specific capital structure. It is found that a significant positive relationship exists between the short term debt and the profitability; long term debt and profitability; total debt and profitability. The both results are consistent with static trade-off theory. This paper is much informative in the context of financial structure of Cement Sector in Bangladesh. This paper can be a tool for the management of these cement companies to improve their financial structure. This paper may be also important for all those parties who have relationship with these cement companies especially the investors, creditors and employee of the cement companies.

Key Words: Capital Structure, Firm size, Growth and Profitability

Introduction

The debate of optimal capital structure has been the focal point of the finance literature for previous several decades. According to finance theory, the capital structure do affects firm's cost of capital and consequently financial performance. Cost of capital serves as the benchmark for firm's capital budgeting decisions therefore the optimal mix of debt and equity is imperative to outperform. Shareholders' wealth maximization concept also dictates that firms choose the optimal mix of debt and equity financing that best serve the ultimate objective of the firm. Capital structure theory in response suggests that firms establish what is often referred to as a target debt ratio, which is based on various trades-offs between the costs and benefits of debt versus equity. Despite of the crucial nature of capital structure decisions the empirical studies have very little to say about the optimal level of debt financing. Therefore, logical parameters with empirical proves are still waited as the available literature is unable to evaporate the rift between practice and theory.

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This paper, by using dynamic panel data techniques, investigates the relationship between capital structure and the profitability of the cement sector of Bangladesh. Cement is a large industry of Bangladesh. The investigation is kept limited to cement industry since different industries have different financing requirements. Previous researchers, including Bradley, Larrel and kim (1984) and Almazan and Molina (2005), reported that firms in a given industry develop similar capital structures. Exogenous variables appear to force firms in the same industry in similar fashion, thus leading to the existence of an industry specific capital structure. According to Eli Schwartz (1959) optimum capital structure varies for firms in different industries because the typical asset structure and earning stability which determine inherent risk vary for different types of production and thus the borrowing powers of the firm. MacKay and Phillips (2002) provided evidence that industry factors help explain firm financial structure, the diversity of firms that populate industries, and the simultaneity of real and financial decision.

The rationale of this study is to provide insights into the relationship between capital structure and financial performance of Bangladesh's cement industry. The pioneer work on capital structure by Modigliani and Miller (1958) despite of the unrealistic assumptions has been source of inspirations for scholars. Their propositions state that the market value of any firm and its cost of capital are independent of its capital structure in presence of perfect market conditions. In the real world, uncertainty and lack of knowledge as to the relevant variables may make this optimum solution a difficult achievement.

Literature Review

Over the past several decades' corporate finance researchers have devoted considerable efforts to transform rationalism of capital structure into empiricism. The problem of developing a definitive theory of capital structure and designing empirical tests those are powerful enough to provide a basis for choosing among the various theories is still unresolved.

The available literature on leverage and profitability depicts a great deal of theoretical controversies. The pecking order theorists Myers (1984), Myers and Majluf (1984), and Shyam-Sunder and Myers (1999) states that firms have a preference of using internal sources of financing first, then debt and finally external equity obtained by stock issues. The preferences are attributed to the cost gap between internal and external funds due to asymmetric information and agency problems. Holding it true profitable firms prefer capitalization of earnings over debt and new equity issues respectively. This tendency portrays negative association between leverage and profitability of the firm. This association is one of the most systematic findings in the empirical literature (Kester, 1986; Harris and Raviv, 1991; Rajan and Zingales, 1995; Hung Albert and Addie, 2002). Their findings suggest that firms follow a pecking order. Whenever possible firms raise finance preferably from their internal sources, rather than bank loans and debt issue. The external equity financing is there last resort. A study of Saudi Arabia by Sulaiman A. Al-Sakran (2001) where debt do not offer any tax-shield, also reported a negative relationship between profitability and leverage. It is pertinent to elaborate that in Saudi Arabia tax

is calculated on the net worth rather than on profits (Zakat and Usher) therefore the tax advantage of the debt is out of question. Well known agency cost theory (Jensen and Meckling, 1976) also tends to support this relationship. Booth, Aivaizian, Kunt and Maksimovik, (2001) documented that more profitable is firm, the lower the debt ratio' regardless of how debt ratio is defined.

On the other hand in accordance with trade-off theory an opposite relationship may also be envisaged. Various researchers have analyzed different types of trade-offs between capital structure and corporate taxes (Modigliani and Miller 1963), personal taxes (DeAngelo and Masulis 1980) and transaction cost of bankruptcy (Kraus and Litzenberger 1973). The stated rationale is when firms are profitable they prefer debt to benefit from the tax shield. Other way round profitability is a good proxy for low default risk in consequence profitable firms can borrow more funds at cheaper rates as the likelihood of paying back the debt is greater. Firms use debt financing to dilute their cost of capital due to low Weighted Average Cost of Capital (WACC) firms have wider spans of acceptance for capital budgeting choices. Employment of low cost capital in productive investment avenues enables firms to magnify their profits. It is also consistent with the objective of financial management i.e. maximization of present shareholders' wealth. S. Klien, O'Brien and Peters (2002) also argued that firms with lower expected cash flows find it more difficult to incur higher level of debt (because bankruptcy is more likely) than do firms with higher level of expected cash flows. Companies with large and stable profits should, all else equal, make greater use of debt to take advantage of interest tax shields Anil and Marc Zenner (2005). Jensen (1986) reported that profitable firms might signal quality by leveraging up, resulting in a positive relation between leverage and profitability. Joshua Arbor (2005) reported significantly positive relationship between short term debt and profitability and negative association between long term debt and profitability. This implies that an increase in the long-term debt position is associated with a decrease in profitability.

Long and Malitz (1986); found no relationship between capital structure and profitability. Using a US sample Fama and French (1998) also concluded that the relationship between capital structure and firm value was unreliable. They compared the two competing models, with mixed results. However, they also find that among growth firms, the least levered firms make the largest new equity issues, which is inconsistent with the pecking order model. Lemmon and Zender (2001) separated firms into two groups based on the foregone tax benefits associated with debt financing. They document that a large fraction of firms are conservatively financed, and that neither the pecking order nor the tradeoff theory of capital structure adequately explain this result. Minton and Wruck (2002) found little evidence that the tradeoff theory explains the capital structure choices of low debt firms. Rather, they find that low debt firms appear to follow a financing hierarchy. Brealey and Myers (2003) contend that the choice of capital structure is fundamentally a marketing problem. Dynamic capital structure models take into consideration the costs of adjusting toward the target debt-to-equity ratio (Maris and Alayan (1990); AydinOzkan, (2001).

Objectives of the Study

This paper mainly tried to focus the relationship between capital structure and financial performance of cement industry in Bangladesh. The present study has been conducted with a view to achieving the following specific objectives:

- To examine the relationship between short term debt and profitability of sample cement companies in Bangladesh.
- To examine the relationship between long term debt and profitability of sample cement companies in Bangladesh.
- To examine the relationship between total debt and profitability of sample cement companies in Bangladesh.
- To suggest some measures for improvement in financial structure of cement companies in Bangladesh.

Data and Methodology

Data consist of five cement firms listed on the Dhaka Stock Exchange for the period 2009–2015. Annual data extracted from the financial statements of these companies over 7 year's period has been used for analysis. The entire set of variables used in this study is based on book values. Myers (1984) advocated that the book values are proxies for the values in place. Panel data analysis allows studying the dynamic nature of the capital structure decisions at the firm level of cement industry. Companies with negative equities and having DA (Debt to Asset) ratio greater than one have been excluded due to deceptive results. Variable used for the analysis include profitability and leverage ratios. Profitability is measured by commonly used ratio by many researchers i.e. Return on Equity (ROE). It is worked out by dividing the net profit before interest and taxes by the shareholders' equity, expressing the result in percentage. Return on equity demonstrates the percentage earnings of the shareholders' funds. Leverage ratios include:

1. Short-term debt (current liabilities) to the total assets
2. Long-term debt (fixed liabilities) to total assets
3. Total debt (total liabilities) to total assets

Short term debt include all liabilities, which are required to be discharge within one year, Alternatively, these cover those obligations whose liquidation is expected to be made out of current assets. They are usually incurred in the normal course of business and are required to be paid at fairly definite dates. Long term debt includes all liabilities other than the short term debt and Shareholders' equity. Total debt pertains to sum of total fixed liabilities and current liabilities except shareholder's equity. Assets include all assets at their book value.

Firm size and sales growth are also included as control variables. Natural logarithm of sales has been taken as proxy for size (SIZE). This measure is the most common proxy for size (Titman and Wessels, 1988; Rajan and Zingales, 1995; Ozkan, 2001). Sales growth is the percentage increase or decrease in sales between

two time periods. Linear regression model is used to investigate the nature of relationship between Capital Structure and profitability. The motive of studying short term, long term and total debt separately is to investigate the impact of different type of financing options minutely. Since the cost / benefits of short term debt and long term debt differs to a great extent. Therefore, separate analysis can better explain the relationship.

The following regression equations are used in the analysis.

$$1. ROE_{i,t} = \alpha + \beta SDA_{i,t} + \beta SIZE_{i,t} + \beta SG_{i,t} + e$$

$$2. ROE_{i,t} = \alpha + \beta LDA_{i,t} + \beta SIZE_{i,t} + \beta SG_{i,t} + e$$

$$3. ROE_{i,t} = \alpha + \beta DA_{i,t} + \beta SIZE_{i,t} + \beta SG_{i,t} + e$$

Where:

$ROE_{i,t}$ is EBIT divided by equity of firm i in time t;

$SDA_{i,t}$ is short-term debt divided by the total assets of firm i in time t;

$LDA_{i,t}$ is long-term debt divided by the total assets of firm i in time t;

$DA_{i,t}$ is total debt divided by the total assets of firm i in time t;

$SIZE_{i,t}$ is the log of sales for firm i in time t;

$SG_{i,t}$ is sales growth of firm i in time t; and

e is the error term.

The return on equity is kept dependent variable and the leverage ratios and control variables as the independent variables. In most of the studies of capital structure Return on Equity is considered independent variable. Because we are primarily interested in the nature of relationship between capital structure and profitability keeping other things constant therefore, the rearrangement of the variables provide the same results. Our area of concern is the magnitude as well as nature of relationship. The signs and values of coefficient along with measures of significance are pertinent to our intention.

Empirical Results

Descriptive Statistics

In this section descriptive statistics of the variables used in analysis are presented to look at the nature and validity of the data. All variables are based upon accounting values and are thus determined simultaneously. Average value of return on equity (ROE) over 7 years period is 38.2% that demonstrates a good performance of the industry in the period under study. Overall the annual sales growth of 5.55% stating that cement industry of Bangladesh is observing a moderate growth. Average of short term debt to total assets is 45.4427% that depicts a noteworthy portion of assets is financed with the short term debt. This suggests that short-term debt tends to be easily available therefore companies use short term debt as their major source of financing. Long term debt to total assets as compared to the short term debt to assets

is low i.e. 12.1195%. The under developed nature of the long term debt market might be one of the possible reasons. Overall 57.5622 % assets are financed with the debt that depicts cement is moderately leveraged industry. However, the debt ratio variation across the firms is large, ranging from a maximum debt ratio of 90.70 % and a minimum of 22.28 %. And the deviation of total debt ratio is 23.68%.

Table 1: Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
ROE _{i,t}	-0.4029	2.4399	0.382000	0.4482363
SDA _{i,t}	0.2058	0.8342	0.454427	0.2058640
LDA _{i,t}	0.0037	0.2970	0.121195	0.0842330
DA _{i,t}	0.2228	0.9070	0.575622	0.2368493
SIZE _{i,t}	20.2218	23.1728	22.063754	0.9436507
SG _{i,t}	-0.33	0.74	0.0555	0.22400

Regression Statistics

Results of the Regression Equations used in the analysis are exhibited in this section. The results are discussed separately that enable us to make comparison of the different debt financing options. The separation of results also permits us to observe inherited almost opposite characteristics of short term debt and the long term debt in association with control variable.

Equation 1

In the first equation the relationship of short term debt with the profitability is studied keeping size and sales growth controlling variables. It is found that the significant positive relationship between short term debt and profitability exists. The negative value of coefficient of beta (1.170) is empirically significant (t-value 2.907) at 95% confidence level. The results are consistent with the trade-off theory. The results also dictate that profitable firms use short term debt as high profit level gives rise to a higher debt capacity and accompanying tax shields.

$$ROE_{i,t} = \alpha + \beta SDA_{i,t} + \beta SIZE_{i,t} + \beta SG_{i,t} + e$$

Table 2: Profitability (EBIT/equity) Ordinary least squares

Variables	Coefficients	Standard Error	t Value	P-value
Intercept	0.669	2.017	0.332	0.742
SDA _{i,t}	1.170	0.402	2.907	0.007
SIZE _{i,t}	-0.038	0.086	-0.438	0.664
SG _{i,t}	0.296	0.303	0.977	0.336

a. Dependent Variable: ROE

Regression Statistics

Multiple R	0.572
R Square	0.327
Standard Error	0.38506

Equation 2

The results given in the table below depict that empirically significant positive relationship exist between the long term debt and the profitability. The results are consistent with the trade-off theory the positive value of beta (.859) is significant at 95% confidence level further t value of (.908) exhibit that the relationship is empirically reliable. It dictates that profitable firms prefer higher level of long term debt in the capital structure. The results tend to refute the pecking order theory (information theory) and support the trade-off theory.

$$ROE_{i,t} = \alpha + \beta LDA_{i,t} + \beta SIZE_{i,t} + \beta SG_{i,t} + e$$

Table 3: Profitability (EBIT/equity) Ordinary least squares

Variables	Coefficients	Standard Error	t Value	P-value
Intercept	4.858	1.812	2.680	0.012
SIZE _{i,t}	-0.208	0.084	-2.481	0.019
SG _{i,t}	0.216	0.343	0.631	0.532
LDA _{i,t}	0.859	0.947	0.908	0.371

Regression Statistics	
Multiple R	0.407
R Square	0.166
Standard Error	0.4287306

Equation 3:

There is a positive relationship (beta 0.822) between total debt and profitability. Which indicates that if firm use more debt then its profitability will be increased. The results are consistent with the trade-off theory the positive value of beta (0.822) is significant at 95% confidence level further t value of (2.567) exhibit that the relationship is empirically reliable. It dictates that higher level of debt in the capital structure of the firm higher the profitability.

$$ROE_{i,t} = \alpha + \beta DA_{i,t} + \beta SIZE_{i,t} + \beta SG_{i,t} + e$$

Table 4: Profitability (EBIT/equity) Ordinary least squares

	Coefficients	Standard Error	t Value	P-value
Intercept	2.225	1.807	1.231	0.227
DA _{i,t}	0.822	0.320	2.567	0.015
SIZE _{i,t}	-0.106	0.078	-1.351	0.187
SG _{i,t}	0.323	0.314	1.030	0.311

Regression Statistics	
Multiple R	0.542
R Square	0.294
Standard Error	0.394488

The values of Coefficient of Determination i.e. R Square are considerably low in all three equations. The ultimate cause is there are numerous factors that determine the profitability. In this study we are barely interested in studying the relationship of leverage and profitability therefore, values of individual variables' statistics are relevant with propositions of the study. Results are significant enough to serve our purpose best. Overall the results are consistent with the existing research.

Conclusion

On the basis of findings, it is documented that short term debt has significant positive relationship with the profitability. This suggests that incremental short-term debt in capital structure will lead to a increase in profit levels. Therefore short term debt is the preferable source of financing for the profitable firms. Similarly long term debt has significant positive relationship with the profitability, therefore employing high proportions of long term debt in financial structure results in high profitability. Again the total debt is positively related with profitability. On the basis of these findings it is concluded that the relationship between short term debt and the profitability; long term debt and profitability; total debt and profitability is consistent with the static trade-off theory.

In the light of whole debate it is suggested that existing theories of capital structure contribute to some extent in decision-making process though certain aspects of the theories are partially refuted. The definite reason is the fact that the capital structure decision is a complex, multi-dimensional problem; thus capital structure decisions are likely to be the product of multifarious group processes. Simply it is difficult if not impossible to mull over all relevant factors with bounded rationality, at least in the current scenario. In-depth case study observations of individual firms' financing decisions over time would be especially valuable in exploring this diversity.

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