

Debt Financing and Firm Performance: Evidence from an Emerging South-Asian Country

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Abstract

This paper aims to empirically investigate the impact of capital structure choice on the firm

performance of the firms listed under the Dhaka Stock Exchange of Bangladesh. Multiple regression has been employed in this research to determine the relationship between the capital structure and the firm's financial performance. Three ratios of financial performance, i.e., return on assets, return on equity, and gross margin, have been used as a sample of non-financial Bangladeshi companies, selected from 2010 to 2015. The study records numerous findings. First, the result shows a significant negative influence of long-term debt (LTD) and total debt (TTD) on firm financial performance measured by return on assets (ROA), but no significant relationship is found between short-term debt (STD) and this measure of firm's financial performance. Moreover, the research found that there is no significant effect of short-term debt, long-term debt and total debt on the firm financial performance measured by return on equity (ROE). Finally, the result shows that a significant negative influence of short-term debt and total debt on firm performance measured by GM, but no significant relationship was found between long-term debt and financial performance. In general terms, the results of this study may suggest that capital structure has a negative influence on firms' financial performance in Bangladesh.

Keywords: Capital structure, Firm performance, Leverage, Accounting, Bangladesh

1. Introduction

Capital structure refers to the monetary framework of a firm that consists of combined debt, equity, and retained earnings. Additionally, capital structure means the amount of debt-equity that a company has employed to finance its operations and growth. In financial terms, capital structure indicates how a firm finances their property through combined equity, debt, or hybrid securities. Financial managers have to make three key financing decisions-investment, financing, and dividend payment, including capital structure decisions (Van Horne & Wachowicz, 1995). Thus, if financing decision adds no value in the capital structure of firms, it is no longer some manager's concern. Evidence suggests that this event did not now maintain (Modigliani & Miller, 1958).

A number of theories for instance the pecking order theory, the agency theory, and trade-off theory have advanced to provide an explanation for the capital structure choice of firms. However, researchers have not been able to locate the best capital structure for a firm due to the lack of consistency regarding what would be suitable as the best capital structure, which has required the need to conduct this research study. An exceptional thinking of the issue sheds some light on the idea of capital structure and its effect on firm financial performance. Various studies have been conducted on this topic in different countries. Margaritis and Psillaki (2010) found a significant positive effect between capital structure and a firm's efficiency. In their study, both low and high growing French firms were used as a sample. Capital structure, debt maturity, and performance of firms are influenced by the institutional surroundings in each developing and developed countries. Furthermore, firms in developing countries use more debt (Fan et al., 2012). However, the empirical proof for relationship between debt financing and firm's performance is inconsistent and varied. Though a positive relationship between debt level and firm's financial performance has been noted in some studies (Taub, 1975; Roden & Lewellen, 1995; Ghosh et al., 2000; Hadlock & James, 2002;

Frank & Goyal, 2003; Berger & Patti, 2006), other studies document a negative relationship between them (Rajan & Zingales, 1995; Fama & French, 1998; Gleason et al., 2000; Simerly & Li, 2000; Zertun & Tian, 2007).

In the context of Bangladesh, this research is unique for the following reasons: i) The capital market in Bangladesh is less efficient than that in developed countries, and solid data about capital markets is not available to the public, particularly, the investors; ii) The capital market is still a value-based market. This may be because financing decisions are incomplete and lead to a big degree of irregularity.

The main objective of this research is to empirically investigate the relationship between leverage level and firms' financial performance of the selected non-financial companies of the Dhaka Stock Exchange during 2010-2015 using three financial ratios of financial performance: return on assets (ROA), return on equity (ROE), and gross margin (GM). In general terms, the results of this study recommend that there exists a negative influence between capital structure choice and firms' financial performance in Bangladesh.

2. Literature Review

Roden & Lewellen (1995) stated that the company capital structure decision is taken with the purpose of explaining why the determined financing choice is made by an individual firm to accomplish the transactions. This is because financing selections are organized systematically to react to variations across firms in their plans to promote assets, in their income's variability, in their liquidity characteristics, and in their opportunity to attain tax saving from deductibility. Financing choice is an important matter to respond correctly for executing the transaction of the firm. The most regularly used performance measure variables are ROA, ROE, and ROI. Many researchers used these variables as accounting measures, representing financial ratios from income statement and balance sheet. Additionally, performance measure usefulness may affect the stock and capital market and the goal of a firm that ought to have an effect on its desire of performance measures. For example, market performance measure will now not provide an exact result if the stock market is no longer quite developed (Demsetz & Lehn, 1985; Gorton & Rosen, 1995; Mehran, 1995; Ang et al., 2000).

Generally, the capital structure choice of firm could be described by two main theories: the trade-off theory and the pecking order theory. As stated by the trade-off theory, the most optimum capital structure could be estimated with the aid of balancing various benefits and costs associated with debt financing. Debt benefits include tax shields (saving) caused via the deductibility of interest expenses from pre-tax income of the company (Modigliani & Miller, 1963), discount of agency costs through the threat of liquidation, which motives personal losses to managers of salaries, reputation, and perquisites, and through the need to generate cash flow to pay interests (Williams, 1987). Furthermore, high leverage can increase the firm's performance with the aid of reducing disagreements between shareholders and directors regarding the free cash flow (Jensen, 1986), most appropriate funding approach (Myers, 1977), and the amount of risk to be undertaken (Jensen & Meckling, 1976).

On the other hand, the pecking order theory developed by Myers & Majluf (1984) point out

that due to the information asymmetry between managers and investors regarding the investment opportunities of firms, the market may undervalue the price of the new share of firm that would be assessed if a manager exposes information related to investment opportunities to the share market. Thus, assigning new shares could put down the present shareholders over price allocation from long-standing to recent shareholders. Hence, managers will choose funding new investment by internal source, and if it is not enough, then managers will collect from external source. Thus, as stated by the pecking order theory, firms use less debt in their capital structure that are profitable and, therefore, make high earnings to be reserved than those who do not make high earnings, as the firms are highly capable to finance their investment prospects with retained earnings. Consequently, debt level has a negative relationship on a firm's performance (i.e., profitability). Many studies show in their empirical evidence that there is a positive relationship between capital structure choice and a firm's financial performance (Hadlock & James, 2002; Berger & Patti, 2006).

From the presented studies above, it can be clarified that developed countries conducted most of the research activities regarding the relationship between capital structure and a firm's financial performance. But, a limited number of studies examined empirically the relationship between capital structure and a firm's financial performance in emerging economies. Abor (2007) examined the effect of capital structure on profitability in the Ghana Stock Exchange listed firms for five years, result showing that there is positive relationship between short term debt to total assets and a negative relationship between long term debt to total assets and ROE. Furthermore, Kyereboah-Coleman (2007) investigated the connection between debt level and financial performance of microcredit organizations in Sub-Saharan Africa, the result illustrating that high debt level is positively correlated with firm's financial performance (return on equity and return on assets). Margaritis & Psillaki (2007) investigated the correlation between firm efficiency and leverage of 12,240 New Zealand firms using a quantile regression analysis, whose results show that the inverse causality effect of effectiveness on leverage is positively related at low to mid - debt levels but negatively related at high debt ratios. Ebaid (2009) investigated performance of 64 Egyptian-listed firms over the period of 1997-2005 by using multiple regression analysis. The results suggested that there is a negative correlation among short-term debt and total debt to profitability in terms of return on assets (ROA). However, the study showed that short- or long-term debts have no significant relationship on profitability in terms of ROE and gross profit margin. Moreover, Sheikh & Wang (2011) studied 240 listed Pakistani non-financial companies during the period of 2004-2009 and examined their influence of capital structure on the financial performance. Some statistical methods such as OLS and fixed effects and random effects were used in this study. The empirical results of this study showed that a negative correlation existed between long-term & short-term debt ratios and ROA. Salim & Yadav (2012) investigated the relationship between capital structure and firm performance of 237 Malaysian-listed companies during the period of 1995-2011 by using the panel data procedure. The results showed that firm performance and earning per share (EPS) has a negative relationship with STD, LTD, TTD which are measured in term of ROA and ROE. Moreover, in all the sectors, there is a positive relationship between firm's growth and financial performance. Chadha & Sharma (2015) studied 422 listed Indian manufacturing companies on the Bombay Stock

Exchange (BSE) and tested the effect of capital structure on the firms' performance. The result showed that financial leverage has no impact on a firm's performance in term of return on asset (ROA) and Tobin's Q. However, the result is negative and significantly correlated with return on equity (ROE). Vătavu (2015) examined the correlation between capital structure and firm's financial performance over a period of eight years (2003-2010) in 196 Romanian manufacturing companies listed on the Bucharest Stock Exchange. The result of the study shows that Romanian companies' financial performance are higher when they use less debt and work based on equity. However, it appears that manufacturing companies in Romania lack of sufficient internal finance to undertake profitable investments options and do not utilize their assets properly. Yazdanfar & Öhman (2015) investigated the correlation between debt level and financial performance of 15,897 Swedish SMEs which include five industry sub sectors during the period of 2009-2012. The result shows that debt ratios, short-term debt and long-term debt, negatively influence the firm financial performance in terms of ROA and ROE.

Indeed, experimental studies involving the relationship between capital structure and financial performance in the developed countries provide mixed and inconsistent evidence; however, a limited study empirically detected this relationship in developing economies like Bangladesh. This study provides a sound view of extended literature on the firm's capital structure choices by evaluating the relationship between capital structure and firm's financial performance in Bangladesh. In fact, Bangladesh is an exclusive instance for several logics such as the stock market in Bangladesh is less competent and suffers from higher level of information irregularity than stock markets in developed countries. Additionally, the capital market in Bangladesh is based on an equity market, and the debt market structure of this country is still very immature and incompetent. This environment of the market may lead to incomplete financing decisions and subject to a significant degree of irregularity. Therefore, it is very important to discover the soundness of debt financing and firms' financial performance relationship underneath these special economic environment settings.

3. Methodology

3.1 Sample and Data

In this study, all publicly traded companies listed on Dhaka Stock Exchange (DSE) are used for ratios calculation during the period of 2010-2015. Our sample has 12 sectors that consist of 191 individual quoted companies, of which 50 companies have been selected. Recorded companies of DSE database were then removed for considering several factors; the financial institutions were abandoned from the sample due to the nature of their financial statement, and the remaining companies were then calculated for available financial data in their websites. Financial services institutions include bank, corporate bond, debentures, insurance, mutual funds, treasury bond, etc. All data have been obtained by consulting DSE-listed companies' database. Table 1 provides the distribution of the sample by industry.

Table 1. DISTRIBUTION OF THE SAMPLE BY INDUSTRY

Industry Name	Number of companies
Cement	5
Ceramics Sector	2
Food and Allied	3
Fuel and Power	5
IT Sector	1
Pharmaceuticals and Chemicals	9
Telecommunication	1
Travel and leisure	1
Engineering	8
Service and Real Estate	3
Tannery	1
Textile	11
Total	50

Source: <https://www.dsebd.org/company%20listing.php>

3.2 Variable Motivation and Description

3.2.1 Performance: Literature uses various measures of a firm's financial performance, such as accounting ratios calculated from firm's consolidated financial statements, for example, ROE, ROA, and GM and Tobin's Q measures (Majumdar & Chhibber, 1999; and Abor, 2005, 2007). This study has used three of the common accounting-based performance ratios, ROA, ROE, and GM, to evaluate the firm's financial performance.

3.2.2 Financial leverage: Related to past literature, financial leverage was examined in this study by three financial ratios (Abor, 2005, 2007): (i) Short-Term Debt to total assets; (ii) Long-Term Debt to total assets; (iii) Total Debt to total assets.

3.3.3 Control variable: By including the size variable in the model, this research controls the variations in a firm's operating environment. Size is calculated by the log of total assets of the firm and is comprised in the model to control for the effects of firm size.

The following ratios are calculated from the listed companies' financial statement:

Table 2. ABBREVIATION OF FINANCIAL RATIOS

Return on assets (ROA)	$ROA = \frac{\text{Net Income}}{\text{Total Asset}} \times 100$
Return on equity (ROE)	$ROE = \frac{\text{Net Income}}{\text{Shareholder Equity}} \times 100$
Gross Margin (GM)	$GM = \frac{\text{Gross Profit}}{\text{Revenue}} \times 100$
Short-Term Debt (STD)	$STD = \frac{\text{Current Liabilities}}{\text{Total Assets}} \times 100$
Long-Term Debt (LTD)	$LTD = \frac{\text{Long – term Debt}}{\text{Total Assets}} \times 100$
Total Debt Ratio (TD)	$TD = \frac{\text{Total Debt}}{\text{Total Assets}} \times 100$

3.3 Research Model

The following regression models have used to test the relationship between leverage level and a firm's financial performance (Ebaid, 2009):

$$\text{Performance}_{I,t} = \beta_0 + \beta_1 (\text{STD})_{I,t} + \beta_2 \log (TA)_{I,t} + \text{ei}_{I,t} \dots \dots \dots (1)$$

$$\text{Performance}_{I,t} = \beta_0 + \beta_1 (\text{LTD})_{I,t} + \beta_2 \log(TA)_{I,t} + \text{ei}_{I,t} \dots \dots \dots (2)$$

$$\text{Performance}_{I,t} = \beta_0 + \beta_1 (\text{TTD})_{I,t} + \beta_2 \log(TA)_{I,t} + \text{ei}_{I,t} \dots \dots \dots (3)$$

Where:

$STD_{I,t}$ = Short-term debt to total assets for firm *I* in year *t*.

$LTD_{I,t}$ = Long-term debt to total assets for firm *I* in year *t*.

$TTD_{I,t}$ = Total debt to total assets for firm *I* in year *t*.

$\log (TA)_{I,t}$ = logarithm of total assets for firm *I* in year *t*.

$\text{ei}_{I,t}$ = the error term.

4. Analysis and Discussion

4.1 Descriptive Statistics

Table 3 presents a summary of the descriptive statistics of the dependent and independent variables used in this study. Descriptive statistics show mean, standard deviation, minimum, and maximum. First, the mean value of ROA, ROE, and GM are 0.0728, 0.1357, and 0.2866, respectively. The mean capital structures STD, LTD, and TD are about 0.4445, 0.0998 and 0.4544, respectively, which indicates that these results indicate that Bangladeshi-listed firms rely upon more largely on short-term debt (STD) for funding their operation than long-term

debt (LTD). The extensive dependence on short-term debt rather than on long-term debt by Bangladeshi-listed firms may be a result of the nonappearance of a well-established public share market.

Table 3. DESCRIPTIVE STATISTICS

Variable	Mean	ST. deviation	Minimum	Maximum
ROA	0.0728	0.0685	-0.1228	0.3400
ROE	0.1357	0.1388	-0.5918	0.6435
GM	0.2866	0.1702	-0.1646	0.9957
STD	0.4445	0.2602	0.0258	1.0000
LTD	0.0998	0.1002	-0.0002	0.5697
TD	0.4544	0.2097	0.0008	0.9279
Log <i>TA</i>	9.3658	0.9263	6.3500	11.0700

Source: Authors own calculation

Thus, financing availability on long-term basis to Bangladeshi-listed firms is direct borrowing from banks and credit institutions. However, these sources are very hard to rely on in case of the very confining debt agreement faced by these firms as well. The data itself is taken from 2010 to 2015 comprise of 50 companies listed on the Dhaka Stock Exchange, but the age of the companies is different.

4.2 Regression Results

Table 4-6 show results of the relationship between debt level and a firm's performance using ordinary least squares regression formula. Table 4 represents the results of testing the ratio of short-term debt (STD) to total assets (Model no 1), the ratio of long-term debt (LTD) to total assets (Model no 2), the ratio of total debt (TD) to total assets (Model no 3), and firms' financial performance measured by return on assets (ROA).

Table 4. PERFORMANCE (ROA)

Variable	Model 1	Model 2	Model 3
Constant	0.239	0.236	0.275
STD	-0.016 (0.274)		
LTD		-0.087 (0.023)	
TTD			-0.104 (0.000)
Log <i>TA</i>	-0.170 (0.000)	-0.170 (0.000)	-0.170 (0.000)
R ²	0.055	0.068	0.153
F	8.717	10.819	26.910
Sig.	0.000	0.000	0.000

As depicted in this table, the results show that there is a significant negative relationship between LTD and ROA; at the level of confidence of 95%, the coefficient value of LTD in Model no 2 is negative and also statistically significant, which indicates that an increase

amount in LTD is associated with a decrease amount in ROA. Additionally, the results also show that a significant negative relationship between TTD and ROA are existed; the coefficient value of TTD in Model no 3 is negative which is also statistically significant at the confidence level of 95%. This result suggests that an increase value in TTD is directly associated with a decrease value in ROA. This effect may be because of LTD being the extensive number of capital structure of Bangladeshi firms. This suggests that an increase amount in the long-term debt position is related with a decrease in profitability.

Furthermore, this can be described by the fact that long-term debts are comparatively more expensive, and, therefore, using high percentages of them could lead to low level of profitability. On the other hand, in Table 4, no significant relationship is found in STD with ROA; the coefficient value of STD is not statistically significant in Model no 1 at 95% level of confidence. Consequently, the results suggest that firm performance (ROA) also negatively related with control variable (firm size).

As shown in Table 5, the results show that neither STD, LTD, nor TTD has a significant relationship with a firm's financial performance as examined by ROE; the coefficient value of STD in Model no 1, the coefficient value of LTD in Model no 2, and the coefficient value of TTD in Model no 3 are not statistically significant at 95% level of confidence. Additionally, the results suggest that the control variable (firm size) and firm's performance have no significant effect with each other.

Table 5. PERFORMANCE (ROE)

Variable	Model 1	Model 2	Model 3
Constant	0.272	0.293	0.277
STD	0.039 (0.200)		
LTD		0.014 (0.863)	
TTD			0.038 (0.315)
Log <i>TA</i>	-0.016 (0.058)	-0.017 (0.051)	-0.017 (0.050)
R ²	0.018	0.013	0.016
F	2.740	1.920	2.418
Sig.	0.066	0.148	0.091

The results mentioned in Table 6 also suggests that STD and TTD have significant negative relationship with a firm's financial performance as examined by GM; the coefficient value of STD in Model no 1 and the coefficient value of TTD in Model no 3 are statistically significant at 95%. confidence level. Instead, in Table 6, LTD in Model no 2 has no significant relationship with gross margin (GM). The control variable (firm size) has a significant effect on GM.

Table 6. PERFORMANCE (GM)

Variable	Model 1	Model 2	Model 3
Constant	0.005	-0.050	0.087
STD	-0.103 (0.005)		
LTD		-0.022 (0.821)	
TTD			-0.325 (0.000)
Log TA	0.035 (0.001)	0.036 (0.001)	0.037 (0.000)
R ²	0.063	0.039	0.199
F	10.054	6.000	36.824
Sig.	0.000	0.003	0.000

5. Conclusion

The capital structure decision is important for any business organization. This decision is crucial because of the need to maximize return by minimizing the cost of capital and risk and the impact of the capital structure decision on a firm's capability to deal with its competitive situation. In this study, an extensive number literature review examines the implication of the capital structure preference on a firm's performance. Considerable number of these researches examined these models in the developed countries, but very few is empirically familiar with such implications in developing countries such as Bangladesh. This study investigates the impact of the capital structure choice on the performance of listed firms in Bangladesh and using total three financial performance ratios (ROA, ROE, and GM). The empirical result of the study shows that capital structure, particularly LTD and TTD, shakes negatively on a firm's financial performance as examined by ROA, but no significant relationship is found for STD and this measure of financial performance. On the other side, capital structure (STD, LTD, and TTD) has no significant effect on a firms' financial performance as examined by ROE. Again, capital structure (particularly, STD and TTD) shakes negatively on a firm's financial performance as examined by GM, but no significant relationship is found between LTD and this measure of firms' performance.

The empirical tests indicate that capital structure (LTD and TD) has negative significant influence on a firm's financial performance which is measured by ROA, and these results are consistent with that of Rajan and Zingales (1995), Zetun and Tian (2007), and Abor (2007), who showed that a firm's performance is negatively correlated to its capital structure. These finding are different with that of Taub (1975), Roden and Lewellen (1995), Ghosh et al. (2000), Hardlock and James (2002), Frank and Goyal (2003), and Berger and Patti (2006), who discovered that there is a positive correlation between firm financial performance and capital structure choice.

Standards should be established to measure the financial performance of firms so that firms can select their capital structure properly. The management of non-financial institutions in the Dhaka Stock Exchange should strive toward achieving an optimal capital structure by increasing their debt level and reducing dependence on equity. Further research could be conducted with the addition of new variables or other market-based measures to test the

relationship of capital structure on firm performance, which can expose some new findings from Bangladeshi firms.

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APPENDIX

Listed Companies of Dhaka Stock Exchange

Industry	DSE Code	Listed Company
Cement	CONFIDCEM	Confidence Cement Limited
	HEIDELBCEM	Heidelberg Cement Bangladesh
	MICEMENT	M.I. Cement Factory Limited
	LHBL	Lafarge Surma Cement Limited
	PREMIERCEM	Premier Cement Mills Limited
Ceramics	RAKCERAMIC	RAK Ceramics (Bangladesh) Limited
	SPCERAMICS	Shinepukur Ceramics Limited
Food and Allied	APEXFOODS	Apex Foods Limited
	BATBC	British American Tobacco Bangladesh Company
	OLYMPIC	Olympic Industries Limited
Fuel and Power	BARKAPOWER	Baraka Power Limited

	DESCO	Dhaka Electric Supply Company Limited
	KPCL	Khulna Power Company Limited
	LINDEBD	Linde Bangladesh Limited
	SUMITPOWER	Summit Power Limited
IT Sector	BDCOM	BDCOM Online Limited
Pharmaceuticals and Chemicals	ACIFORMULA	ACI Formulations Limited
	BEACONPHAR	Beacon Pharmaceuticals Limited
	BXPHARMA	Beximco Pharmaceuticals Limited
	IBNSINA	Ibn Sina Pharmaceutical Industry Limited
	IMAMBUTTON	Imam Button Industries Limited
	LIBRAINFU	Libra Infusions Limited
	ORIONINFU	Orion Infusions Limited
	RENATA	Renata Limited
	SQURPHARMA	Square Pharmaceuticals Limited
Telecommunication	GP	Grameenphone Limited
Travel and leisure	UNIQUEHRL	Unique Hotel & Resorts Limited
Engineering	BDLAMPS	Bangladesh Lamp Limited
	BSRMSTEEL	BSRM Steel Limited
	DESHBANDHU	Deshbondhu Polymer Limited
	AFTABAUTO	Aftab Automobiles Limited
	BENGALWTL	Bengal Windsor Thermoplastics Limited
	QUASEMIND	Quasem Drycells Limited
	NAVANACNG	Navana CNG Limited
	SALAMCRST	S. Alam Cold Rolled Steels Ltd
Service and Real Estate	EHL	Eastern Housing Limited
	SAPORTL	Summit Alliance Port Limited
	SAIFPOWER	SAIF Powertec Limited
Tannery	APEXFOOT	Apex Footwear Limited
Textile	ANLIMAYARN	Anlimayarn Deying Limited
	APEXSPINN	Apex Spinning & Knitting Mills Limited
	FEKDIL	Far East Knitting & Dyeing Industries Limited
	GENNEXT	Generation Next Fashions Limited
	MATINSPINN	Matin Spinning Mills Limited
	RAHIMTEXT	Rahim Textile Mills Limited
	SAIHAMCOT	Saiham Cotton Mills Limited
	SQUARETEXT	Square Textile Limited
	HWAWELLTEX	Hwa Well Textiles (BD) Limited
	RNSPIN	R.N. Spinning Mills Limited
SAIHAMTEX	Saiham Textile Mills Limited	

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