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The Impact of Capital Structure on Profitability: A Study on Some Selected Private Commercial Banks in Bangladesh

Mohammad Hasmat Ali[1] and Tabassum Chowdhury[2]

ABSTRACT

This study examines the influence of capital structure on the profitability of some selected private commercial banks working in Bangladesh. We used long term debt to equity ratio, Short term debt to equity ratio, total debt to total equity ratio, long term debt to equity ratio, total debt to total asset ratio, asset growth and firm size to measure capital structure. We used three indicators of profitability such as return on asset, return on equity and earnings per share. Applying multiple regression analysis we find that total debt to total equity (TDTE) negatively influence both ROA and ROE, Long term debt to total equity (LTDTE) negatively influences the ROE, Total debt to total asset positively affect the ROE, Size of the banks negatively affect the ROA and EPS and finally asset growth of the banks positively affect ROA, ROE and EPS. From this study, it can be recommended that to increase the profitability the private commercial banks in Bangladesh should use less debt in terms of equity, more debt in terms of total assets. The banks can also be recommended to keep the banks size as small as possible with expected positive growth in assets.

Keywords: Capital structure, profitability, private commercial bank, Bangladesh.

1. STATEMENT OF THE PROBLEM

The concept of capital structure is generally described as the combination of debt & equity that make the total capital of firms. Capital structure is one of the most puzzling issues in corporate finance literature (Brounen & Eichholtz, 2001). It has been considered as one of the most important, effective and influential parameters on the valuation and direction of business organizations in the capital markets. The proportion of debt to equity is a strategic choice of corporate managers. The financial managers engage their efforts to maximize shareholders wealth that requires the determination of the best combination of financial resources for the company. By taking accurate and timely decisions, financial manager can reduce the cost of capital of the company and thereby increase

[1] MOHAMMAD HASMAT ALI, Associate Professor, Department of Finance and Banking, University of Chittagong, Bangladesh, mdhasmat@gmail.com.
[2] TABASSUM CHOWDHURY, Lecturer, Department of Business Administration, East Delta University, Bangladesh.

corporate value. A cautious attention has to be paid as far as the optimum capital structure is concerned. With unplanned capital structure, companies may fail to economize the use of their funds. Consequently, it is being increasingly realized that a company should plan its capital structure to maximize the use of funds and to be able to adapt more easily to the changing conditions (Pandey, 2009).

Profitability is an indicator of performance of the business enterprises. The shareholders, investors, managers, lenders and other stakeholders consider a firm's profitability as a process of evaluating its progress and prospects. Among the different factors that directly or indirectly affect the firm's profitability, capital structure decision is the vital one. The relationship between capital structure and profitability is one that received considerable attention in the finance literature. The study regarding the effects of capital structure on profitability will help us to know the potential problems in performance and capital structure.

Basically, banks engage in financial intermediation to ensure efficient mobilization & disbursement of funds to the real sector of the economy. Though other financial institutions exist to engage in the intermediation process banks are considered the most important financial intermediaries. Like other entities, profitability of banks has been considered to evaluate the performance. Because of different features of capital structure position of banks, it has been realized that the capital structure has an effective roles over profitability.

There have been studies that concentrated in identifying the influence of capital structure on the profitability of the firms. Some studies have specifically been conducted on the effect of capital structure on the profitability of the banks. Buser (1981) mentioned that the capital structure decision of a bank is similar to a non financial firm. But the influences of the capital structure is different due to considerable inter industry differences. Most studies found a negative relationship between profitability and leverage. Titman & Wessels (1988) argue that firms with high levels of profit would maintain relatively lower debt levels. In addition, Kester (1986) found a significantly negative relation between profitability and debt/asset ratios. Rajan & Zingalas (1995) also reported a significantly negative correlation between profitability and leverage in their work. There are some studies which report a different opinion. These studies observed a positive relationship between profitability and debt levels in their studies. Taub (1975) in a regression analysis of four profitability parameters against debt ratio found significantly positive association between debt and profitability. Abor (2005) also found a significantly positive relationship between total debt and profitability.

From the above discussions based on the available empirical literatures, it is clear that the result from investigations on the relationship between capital structure and profitability requires more empirical work. An important question facing banks in need of new finance is whether to raise debt or equity to maintain a good profitability position in banks. In spite of the theoretical debate on capital structure, there is relatively little empirical evidence on how banks and other financial institutions actually select between financing instruments at a given point of time in order to attain optimum profitability. For this reason, the main problem of this research is to study how the capital structure influences the bank's profitability in Bangladesh?

The basic objectives of the study are to find out the impact of capital structure on profitability and to suggest the banks in the way to increase profitability through adapting a better strategic framework of capital structure. The modern industrial firm including banks and other financial units must conduct its business in a highly complex and competitive business environment. Therefore, these types of research findings will be benefited in selecting the capital structure to achieve the optimum level of firm's profitability. This study shows the statistical analysis carried out seeking to discover whether there is any relationship between capital structure and profitability of the selected listed banks in Bangladesh. This study investigates the key factors related to capital structure such as debt ratio, debt-equity ratio, asset growth, size of the firms and key profitability measures such as return on asset (ROA), return on equity (ROE) and Earning Per Share that are considered to evaluate corporate performance. In this research, we first describe the research literature, then specify hypotheses, analysis methods, variables, research models and finally provide research results and necessary suggestions.

2. LITERATURE REVIEW

Capital structure of a company is the combination of funds obtained through debt and equity that make up the sources of corporate assets. The company that has been financed with debt is termed as a leveraged firm. The capital structure of different companies is found different due to size, nature and types of business, accessibility of the firm to the capital market, and policy of the firm as well as the government. Based on their financial policies, the financing resources of companies are divided into internal financial resources and external financial resources. The cost of capital of the firm is considered as a function of its capital structure. The choices of optimal capital structure reduce company's cost of capital and increase its market value (Modarres and Abdoallahzadeh, 2008) and thus will increase shareholders wealth.

Research has been conducted on the different issues related to the determinants of capital structure and effect of capital structure on firm's performance.

Rajan and Zingales (1995) studied the determining factors of capital structure of corporations in seven large countries such as USA, Japan, Germany, France, Italy, Britain and Canada during 1987 to 1991. In their study, they chose 4557 companies as samples and find that financial leverage has negative relationship with profitability and market value to book value ratio and positive relationship with the value of tangible fixed asset and firm size.

Chen and Strange (2005) investigated the relationship between the variables of firm size, firm age, business risk, sale growth rate, tax, profitability and intangible assets with debt ratio (capital structure) in 2003 in 972 stock companies in China and concluded that the relationship between these variables and debt ratio depend on the basis of calculation of dependent variable (market value or book value).

Sogorb (2005) surveyed the impact of small and medium companies' features on their capital structure in Spain for five years from 1994 to 1998 using the data of 6482 nonfinancial companies in 8 industry order. Capital structure has been found negatively related to tax reserves and profitability and positively related with size, growth opportunities and assets structure of those selected companies.

Daskalakis and Psillaki (2005) in their research reviewed the determinants of Capital Structure of the SMEs on the 1252 Greek companies and 2006 French companies for a six-years period from 1997 to 2002. In their study, they used firms' assets structure (tangible assets to total assets ratio), size, growth opportunities and profitability of company as determinants of capital structure and found that assets structure and profitability have negative relationship with debt ratio (Capital Structure) in both countries, but firm size and growth opportunities have positive relationship with Capital Structure.

Capital structure has been found to have direct and indirect influence on the performance of the firms. It is evident that capital structure affects the profitability, solvency as well as the sustainability of the firms. Among the different indicators of firms' performances, profitability is one of the key influential factors. There are some studies on the effect of capital structure on profitability of the firms.

Onaolapo and Kajola (2010) investigated the effect of capital structure on financial performance of companies listed on Nigeria Stock Exchange on 30 nonfinancial companies in 15 industrial sectors for a period of 7 years from 2001 to 2007. They found that the capital structure (debt ratio) has a significant negative effect on financial measures (ROA and ROE) of these companies.

Fosberg and Ghosh (2006) concluded that the relationship between capital structure and ROA is negative.

Houang and Song (2006) studied on the 1200 Chinese companies during 1994 to 2003 and found that financial leverages has negative relationship with return on assets and growth opportunities.

Andersen (2005) reviewed the relationship between capital structure and firms performance for 1323 companies from various industries and concluded that there is a significant relationship between capital structure and ROA.

Elsayed Ebaid (2009) studied the effect of capital structure on the performance of 64 Egyptian companies during 1997 to 2005. The results suggest that there is a significant negative relationship between ROA and total debt to total assets ratio. But there is no significant relationship between ROE and total debt to total assets ratio.

Mramor and Crnigoj (2009) also reported that there is a significant negative relationship between financial leverage (total debt to total assets ratio) and return on assets ratio (ROA).

Ebaid (2009) examined the link between capital structure and performance of firms, by using the three accounting based measure of performance (ROA) return on assets (ROE) return on equity and gross profit margin. He found that there is significant negative influence of short term debt (STD) and the Total debt (TD) on the financial performance measured by the return on asset (ROA) but no significant relationship fond between long term debt (LTD) and this measure of financial performance. He also addressed that there is no influence of the debt (TD, STD and LTD) on financial performance measured by both of gross profit margin and Return on equity.

Pratheepkanth (2011) conducted a study on the capital structure (CS) and its impact on financial performance during 2005 to 2009 of business organizations in Sri Lanka. The result of research validated a negative relationship between capital structure (CS) and financial performances of the Sri Lankan companies.

Céspedes et al. (2010) investigated the relationship between capital structure and ownership in seven Latin American countries during 1996 to 2005. In this study, the numbers of 6766 firm-years were selected as a sample. They concluded that there is a positive relationship between leverage and ownership concentration. Also, the research results indicate a positive relationship between leverage and growth variable, and a negative relationship between leverage and profitability and larger firms have more tangible assets.

Abor (2005) reviewed the impact of capital structure on profitability of the 22 companies listed in Ghana Stock Exchange during 1998 to 2002. Results showed that there is a significant positive relationship between capital structure (total debt to total assets ratio) and return on equity (ROE). Also he indicates that profitable companies have more dependence to financing through liability and high percent (%85) of liabilities of these companies are short term liabilities.

San and Heng (2011) in their research studied the relationship between capital Structure and Corporate Performance of Malaysian Construction Sector during 2005 to 2008. In this study, 49 companies were selected as samples. Results showed that there is a significant relationship between capital structure and corporate performance.

Aburub (2012) in his research investigated the impact of capital structure on the firm performance of companies listed in Palestine Stock Exchange during 2006 to 2010 which 28 companies were selected as samples. In this study, five measures of Return On Equity (ROE), return on assets (ROA), earnings per share (EPS), market value to book value of equity ratio (MVBR) and Tobin Q ratio as the measures of accounting and market of firm performance evaluation and also as dependent variables., and four measures of short-term debt to total assets ratio (SDTA), long-term debt to total assets ratio (LDTA), total debt to total assets ratio (TDTA) and total debt to total equity ratio (TDTQ) as the measures of capital structure and also as the independent variables were selected. Results indicate that the capital structure has a positive effect on firm performance evaluation measures.

Zeitun and Tian (2007) in their study surveyed the impact of capital structure on the firm performance for 167 Jordanian companies during 1989 to 2003. The results suggest that capital structure has significantly negative impact on accounting measures of firm performance evaluation. Also they indicate that short-term debt to total assets ratio (SDTA) has significantly negative impact on market measure of Jordanian companies' performance evaluation i.e. Tobin Q ratio.

Sunder and Myers (1999) examined the effect of four factors: assets tangibility, growth opportunities, company's tax status and profitability on the capital structure (debt ratio) of 157 American companies in the period of 1979 to 1981. Research results indicate a significantly positive relationship between assets tangibility with debt ratio and a significantly negative relationship between debt ratios with firm profitability. Moreover, there is no significant relationship between two variables, growth opportunities and the tax status with the debt ratio.

Chen and Strange (2005) investigated the relationship between the variables of firm size, firm age, business risk, sale growth rate, tax, profitability and intangible assets with debt ratio (capital structure) in 2003 in 972 stock companies in China and concluded that the relationship between these variables and debt ratio depend on the basis of calculation of dependent variable (market value or book value).

Sogorb (2005) surveyed the impact of small and medium companies' features on their capital structure in Spain during 1994 to 1998. In this study, he used from data of 6482 nonfinancial companies in 8 industry order. Results show that tax reserves and profitability of these companies have negative relationship with capital structure while size, growth opportunities and assets structure in these companies have positive relationship with capital structure.

3. RESEARCH HYPOTHESES

In order to investigation the effect of capital structure on bank's profitability, we designed the following hypotheses for testing:

H1: There is a significant relationship between ROA and Long term debt to equity ratio, Short term debt to equity ratio, Total debt to total equity ratio, Long term debt to equity ratio, Total debt to total asset ratio, asset growth and firm size.

H2: There is a significant relationship between ROE and Long term debt to equity ratio, Short term debt to equity ratio, Total debt to total equity ratio, Long term debt to equity ratio, Total debt to total asset ratio, asset growth and firm size.

H3: There is a significant relationship between EPS and Long term debt to equity ratio, Short term debt to equity ratio, Total debt to total equity ratio, Long term debt to equity ratio, Total debt to total asset ratio, asset growth and firm size.

4. RESEARCH METHODOLOGY

The nature of study is descriptive as the objective of this study is to determine the impact of capital structure on bank's profitability. Quantitative analysis is used to analyze the data and deductive approach has been chosen as a research approach.

4.1 Data and Sample

The population of this study includes all the commercial banks in Bangladesh. From this population, sample includes 5 commercial banks from the year 2002 to 2012. The selected banks in this study are AB Bank Limited.

4.2 Variables

This study aims to examine the relationship between capital structure and profitability. The Return on Asset (ROA), Return on Equity (ROE) and Earning per Share (EPS) have individually been considered as a measure of profitability. These factors have also considered as dependent variables. The capital structure position of banks have been analyzed by using different variables such as long Term Debt to Equity ratio, Short term debt to equity ratio, total debt to equity ratio, total debt to total asset, size of the firm and asset growth of the banks. These measurements have taken from annual reports of 5 banks from the year 2002 to 2012. Table 1 states independent variables, their notations and formulae for calculations of these variables in this study:

Table 1: Independent Variables and their Calculations

Variables	Notations	Formulae
Long term debt to equity	LTDTE	Long term debt / total equity
Short term debt to equity	STDTE	Short term debt / total equity
Total debt to total equity	TDTE	Total debt t/total equity
Total debt to total asset	TDTTA	Total debt/ total asset
Size	Sz	Log (total asset)
Asset growth	AG	(Current year asset – previous year asset)/ previous year asset

4.3 Specification of Multiple Regression Models

The following models are used to run multiple regression models to study the impact of capital structure on bank profitability:

$ROA_{it} = \beta_{0it} + \beta_1 STDTE_{it} + \beta_2 LTDTE_{it} + \beta_3 TDTE_{it} + \beta_4 TDTTA_{it} + \beta_5 SZ_{it} + \beta_6 AG_{it} + \mu_{it}$ (1)

$ROE_{it} = \beta_{0it} + \beta_1 STDTE_{it} + \beta_2 LTDTE_{it} + \beta_3 TDTE_{it} + \beta_4 TDTTA_{it} + \beta_5 SZ_{it} + \beta_6 AG_{it} + \mu_{it}$(2)

$EPS_{it} = \beta_{0it} + \beta_1 STDTE_{it} + \beta_2 LTDTE_{it} + \beta_3 TDTE_{it} + \beta_4 TDTTA_{it} + \beta_5 SZ_{it} + \beta_6 AG_{it} + \mu_{it}$(3)

Here ROA indicates return on asset, ROE indicates return on equity EPS indicates earning per share. Whereas LTDTE is long term debt to equity STDTE is short term debt to equity TDTE is total debt to equity TDTTA is total debt to total asset Sz is size and AG is asset growth. Here i denote banks ranging from 1-5 and t denote time period ranging from 2002 to 2012. SPSS (17 version) is used to run the regression models.

5. FINDINGS AND ANALYSIS

5.1 Descriptive Statistics

Table 2 provides descriptive statistics of the dependent and independent variables used in this study. Here Return on Asset (ROA) has average value of around 2 with standard deviation of 0.87 where as ROE has mean value of 19.32 and standard deviation of 7.77 and EPS has average 27.50 with standard deviation of around 24.

Table 2: Descriptive Statistics

Variables	Mean	Std. Deviation	N
ROA	1.8568	.86634	50
ROE	19.3283	7.76893	50
EPS	27.4900	23.56897	50
LTDTE	6.4206	4.46930	50
STDTE	6.2659	5.52393	50
TDTE	12.6865	4.56460	50
TDTTA	.9183	.02672	50
Sz	10.6956	.30283	50
AG	.2261	.11871	50

Source: SPSS output

Table 2, illustrates the finding of the study that TDTE has the highest mean score (mean = 12.69, SD = 4.56) which indicate debts of the banks are around 13 times of equity in financing asset. The banks are mainly based on debt in financing. LTDTE and STDTE have average value respectively 6.42 and 6.27 with SD of 4.47 and 5.52 respectively. it means that selected banks are using 6.42 times long term debt, 6.27 times short term debt against equity. Size has average of 10.70 and Asset Growth rate has average value of 0.23 with SD of 0.13 and 0.302.

5.2 Regression Analysis

5.2.1 The Relationship between ROA and Capital Structure

Regression analysis were applied to examine the relationship between ROA and Long term debt to equity ratio, Short term debt to equity ratio, Total debt to total equity ratio, long term debt to equity ratio, total debt to total asset ratio, asset growth and firm size

Table 3, shows that LTDTE (beta = -0.161), TDTE (beta = -0.801) and Sz (beta = - 0.259) are negatively related to ROA. On the other hand TDTTA (beta = 0.279) and AG (beta = 0.251) have positive relationship with ROA. It has also been found that TDTE, Sz and Ag have significant impacts on ROA because their p values are less than 5%. On the other hand, LTDTE and TDTTA have insignificant impact on ROA because their p values are not found significant.

Table 3: Regression Results on relationship between ROA and Capital Structure

Variables	Regression Coefficients		
	B	t	p-values
(Constant)	3.177	.363	.719
LTDTE	-.031	-1.247	.219
TDTE	-.152	-2.889	.006***
TDTTA	9.058	.986	.329
Sz	-.741	-2.093	.042**
AG	1.832	2.059	.045**

*** Significant at 1% level of significance
** Significant at 5% level of significance

5.2.2 The Relationship between ROE and Capital Structure

The influence of long term debt to equity ratio, short term debt to equity ratio, total debt to total equity ratio, long term debt to equity ratio, total debt to total asset ratio, asset growth and firm size on ROE, were examined via regression technique.

Table 4: Regression Results on relationship between ROA and Capital Structure

Variables	B	T	p-values
(Constant)	-171.265	-1.955	.057
LTDTE	-.493	-1.974	.055*
TDTE	-1.409	-2.676	.010***
TDTTA	241.819	2.633	.012**
Sz	-1.397	-.395	.695
AG	19.955	2.243	.030**

*** Significant at 1% level of significance
** Significant at 5% level of significance
* Significant at 10% level of significance

Table 4, indicates LTDTE (beta = -0.284), TDTE (beta = -0.828) and Sz (beta = -0.054) are negatively related to ROE. On the other hand, TDTTA (beta = 0.832) and AG (beta = 0.305) have positive relationship with ROE. TDTE has highly significant influence on ROE at 1% level of significance and TDTTA and Ag have significant impacts on ROE at 5% level of significance. LTDTE has been found poorly influential on ROE with a 10% significance level. In this study, Sz has been found no significant impact on ROE.

5.2.3 The Relationship between EPS and Capital Structure

Regression is employed to examine the relationship between EPS and long term debt to equity ratio, Short term debt to equity ratio, total debt to total equity ratio, long term debt to equity ratio, total debt to total asset ratio, asset growth and firm size.

Table 5: Regression Results on Relationship between EPS and Capital Structure

Variables	B	t	p-values
(Constant)	187.897	.763	.449
LTDTE	-1.108	-1.578	.122
TDTE	-.723	-.489	.628
TDTTA	309.666	1.200	.237
Sz	-41.174	-4.141	.000***
AG	52.609	2.104	.041**

*** Significant at 1% level of significance
** Significant at 5% level of significance

Table 5, discover that LTDTE (beta = -0.210), TDTE (beta = -0.140) and Sz (beta = - 0.529) are negatively related with EPS and TDTTA (beta = 0.351) and AG (beta = 0.265) have positive relationship with EPS. Analyzing the p-values, it has been found that only Sz and Ag have significant impacts on EPS at 1% and 5% level of significance respectively.

5.2.4 Explanatory Power of the Regression Models

Table 6 highlight the value of R, R-square and adjusted R-square of three models used in our study examining the relationship between ROA and Capital Structure, ROE and Capital Structure and EPS and Capital Structure.

Table 6: Value of R, R-Square and Adjusted R-Square

Models	R	R- Square	Adjusted R-Square
ROA and Capital Structure	.662[a]	.438	.374
ROE and Capital Structure	.549[a]	.301	.222
EPS and Capital Structure	.633[a]	.401	.333

Examining the relationship between ROA and Capital structure, it is observed in Table 6 that R value is 0.662 and R^2 value is 0.438. R value suggest that there is a strong effect of this independent variables on ROA and R^2 value states that 43.8% changes in dependent variable (ROA) is due to independent variables and 56.2% variation in ROA remains unexplained by the independent variables of the study. Examining the relationship between ROE and Capital structure, it is observed in Table 6 that R value is 0.549 and R^2 value is 0.301. R value suggest that there is a strong effect of this independent variables on ROE and R^2 value states that 30.1% changes in dependent variable (ROE) is due to independent variables and 69.9% variation in ROE remains unexplained by the independent variables of the study. Examining the relationship between EPS and Capital structure, it is observed in Table 6 that R value is 0.633 and R^2 value is 0.401. R value suggest that there is a strong effect of this independent variables on ROA and R^2 value states that 40.1% changes in dependent variable (EPS) is due to independent variables and 59.9% variation in EPS remains unexplained by the independent variables of the study. From the analysis, it can be concluded that the models used here to examine the influence of Capital Structure on ROA, ROE and EPS separately can explain properly the variation of the independent variables.

5.2.5 Analysis of Fitness of the Model

This study uses three regression models to examine the relationship between Capital Structure and ROA, ROE and EPS. Table 7 explains the fitness of the three models with F-stats. From Table 7, indicate that for ROA and Capital Structure analysis, F stat is 6.860 and is significant at 1% level of significance. For ROE and Capital Structure and EPS and Capital Structure, F-stats are found as 3.795 and 5.884 and both of the results are highly significant at 1% level of significance.

Table 7: Analysis of Fitness of the Model

Model	F	Sig
ROA and Capital Structure	6.860	.000***
ROE and Capital Structure	3.795	.006***
EPS and Capital Structure	5.884	.000***

6. SUMMARY AND CONCLUSION

In our study, we examined the relationship between the capital structure and profitability of selected private commercial banks in Bangladesh. We used different variables to measure the capital structure such as long term debt to equity ratio, Short term debt to equity ratio, total debt to total equity ratio, long term debt to equity ratio, total debt to total asset ratio, asset growth and firm size. Three indicators of profitability were used such as return on asset, return on equity and earnings per share. We used multiple regression analysis by using SPSS considering the profitability factor (ROA/ROE/EPS) as dependent variable and capital structure as independent variables. We run regression for three times and every time we find the model fit in this study. The models are also found satisfactory with sufficient explanatory power. The results of the study confirm that total debt to total equity (TDTE) negatively influence both ROA and ROE which indicate that the higher the TDTE, the lower the ROA and ROE and vice versa. Long term debt to total equity (LTDTE) is found negatively influencing the ROE which indicated that higher LTDTE reduce the ROE and vice versa. Size is found negatively affecting the ROA and EPS which indicate that large size banks have lower ROA and EPS and small size banks have high ROA and EPS. Finally, it is found in all regression results that asset growth of the banks positively affect ROA, ROE and EPS which indicate that the positive growth in the assets will increase profitability of the banks. From this study, it can be recommended that to increase the profitability the private commercial banks in Bangladesh should use less debt in terms of equity, more debt in terms of total assets. The banks can also be recommended to keep the banks size as small as

possible with expected positive growth in assets. Since this study is with five selected commercial banks in Bangladesh, further study can be extended with more banks and other institutions.

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